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FINAL ACCIDENT PREVENTION PLAN FOR SALVAGE YARD ACCESS ROAD NON-TIME
CRITICAL REMOVAL ACTION NAS OCEANA VIRGINIA BEACH VA
3/26/2012
SES-TECH ATLANTIC

**DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND, MID-ATLANTIC
REMEDIAL ACTION OPERATIONS (RAO)/LONG TERM MANAGEMENT (LTM),
ENVIRONMENTAL MULTIPLE AWARD CONTRACT (EMAC)
CONTRACT NO. N40085-11-D-0043
TASK ORDER NO. 0001**

**FINAL
ACCIDENT PREVENTION PLAN
FOR
OCEANA SALVAGE YARD ACCESS ROAD
NON-TIME-CRITICAL REMOVAL ACTION
AT
NAVAL AIR STATION OCEANA
VIRGINIA BEACH, VIRGINIA**

Issued:

March 26, 2012

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Revision:	Date:	Prepared by:	Approved by:	Pages Affected:
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ABBREVIATIONS AND ACRONYMS

AHA	activity hazard analysis
APP	Accident Prevention Plan
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CPR	cardiopulmonary resuscitation
CSP	Certified Safety Professional
DART	days away restricted or treatment
EHS	Environmental, Health and Safety
EM	Engineer Manual
EMAC	Environmental Multiple Award Contract
EMR	experience modification rate
ESS	Environmental Safety Supervisor
FEAD	Facilities Engineering and Acquisition Division
HSG	Health and Safety Guidelines
HAZWOPER	Hazardous Waste Operations and Emergency Response
LTM	Long Term Management
MSDS	material safety data sheet
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
NTCRA	Non-Time-Critical Removal Action
OSHA	Occupational Safety and Health Administration
PESM	Project Environmental Safety Manager
PM	Project Manager
PPE	personal protective equipment
RAM	respirable aerosol monitor
RAO	Remedial Action Operation
RPM	Remedial Project Manager
SES	Sealaska Environmental Services, LLC
SES-TECH	Sealaska Environmental Services, LLC and Tetra Tech EC, Inc.
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
TtEC	Tetra Tech EC, Inc.
USACE	United States Army Corps of Engineers
ZIP [®]	Zero Incident Performance [®]

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1.0 SIGNATURES

The planned non-time-critical removal action (NTCRA) will be performed by SES-TECH Atlantic (SES-TECH), a joint venture between Sealaska Environmental Services, LLC (SES) and Tetra Tech EC, Inc. (TtEC), under the Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic Remedial Action Operation (RAO) Long Term Management (LTM) Environmental Multiple Award Contract (EMAC).

This section of the Accident Prevention Plan (APP) contains the signatures of the preparer, the two approvers (the Certified Industrial Hygienist [CIH] and the Project Manager [PM]), and a Concurrence Approval by the Authorized Corporate Officer. This APP is intended to provide guidance to project personnel by identifying common job hazards and high loss potential activities.

All personnel working under this APP will sign the acknowledgement form included in the Site Safety and Health Plan (SSHP) for Oceana Salvage Yard Access Road Non-Time-Critical Removal Action provided in Attachment A.

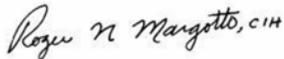
The following personnel participated in the development, review, and approval process of this APP.

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(360) 930-3301

Background Information

- a. **Contractor:** SES-TECH
- b. **Contract Number:** N40085-11-D-0043
- c. **Project Name:** Oceana Salvage Yard Access Road Non-Time-Critical Removal Action
- d. **Project Description and Description of Work to be performed:**

Naval Air Station (NAS) Oceana, located in Virginia Beach, Virginia, has been in existence since 1940 when it was established as a small auxiliary airfield. NAS Oceana is now a 6,000-acre master jet base. The primary mission of NAS Oceana is to provide the personnel, operations, maintenance, and training facilities to ensure that fighter and attack squadrons on aircraft carriers of the U.S. Atlantic Fleet are ready for deployment.

The project site, although not within the gated portion of the station, is owned by the Navy. The Oceana Salvage Yard is located within the buffer zone of NAS Oceana, to the east of Oceana Boulevard (Figure 1). The access road to the Oceana Salvage Yard is on Navy property; the Oceana Salvage Yard maintains an easement to continue access. Historical site information indicates that a large volume of crushed car battery casings was brought to the salvage yard in the 1960s and was used as fill material for the base of the access road.

The overall objective is the removal of lead-contaminated soil from previously defined areas (grids) along both shoulders of the Oceana Salvage Yard Access Road, which runs along Navy property to the property line of the Oceana Salvage Yard Access Road (see Figure 1).

Field mobilization activities will include clearing and grubbing, installation of erosion and sediment controls, underground utility location, and grid surveying to establish the cells designated for hazardous and nonhazardous soil removal. Excavation to 2 feet in depth will begin with grid cells designated for hazardous soil, starting at the eastern end of the project area and moving westward.

After hazardous soil excavation is complete, grid cells designated for nonhazardous soil will be excavated starting at the east and working westward. Prior to backfilling, three-point composite confirmatory samples will be collected from each of the excavated grid cells as well as the north side and south side staging areas. Eighteen inches of certified clean backfill soil will be placed on top of an orange fabric barrier installed at the bottom of each excavation. The remaining 6 inches will be backfilled with stone or topsoil depending on the area. After backfill is complete, the existing access road will be capped with a 5-inch asphalt concrete base course over a 6-inch aggregate base course.

- e. **Project Location:** NAS Oceana is located in Virginia Beach, Virginia. The project site is not within the gated portion of the base, but is owned by the Navy. The Oceana Salvage Yard Access Road is located within the buffer zone of NAS Oceana, to the east of Oceana Boulevard (Figure 2). The access road to the Oceana Salvage Yard is on Navy property; the Oceana Salvage Yard maintains an easement to continue access.
- f. **Anticipated Phases of Work – Tasks Requiring Activity Hazard Analyses (AHAs)**
 - Mobilization (including site preparation and installation of soil erosion controls)
 - Geophysical and Geographical Survey

- Clearing and Grubbing (including chain saw and chipper utilization)
- Soil Excavation and Soil Management (including truck loading and waste management)
- Confirmatory Soil Sampling and Barrier Fabric Placement
- Backfill of Excavation and Regrading
- Gravel Placement and Asphalt Cap Installation
- Restoration (including grass seeding)
- Demobilization (including equipment decontamination)

g. **TtEC Accident Experience Modification Rate**

The current TtEC Interstate Experience Modification Rate (EMR) for Policy Period October 1, 2011 through September 30, 2012 is 0.76.

2.0 STATEMENT OF SAFETY AND HEALTH POLICY

The Management of SES-TECH is committed to ensuring the health, safety, and wellbeing of our employees and the communities in which we work, to enhancing and protecting the environment, and to providing quality service to our clients. This commitment is fundamental to our Client Service Quality[®], Do It Right[®], and Shared Vision[®] operating philosophies.

This APP is intended as a guideline that allows site personnel to respond to routine work conditions in a safe and compliant manner.

This APP has been developed to fulfill this goal and achieve the following objectives:

- Instruct SES-TECH employees and subcontractors on safe work procedures.
- Provide guidelines for emergency response for known hazards and hazardous situations.
- Specify actions required to comply with applicable guidelines from United States Department of Labor, Occupational Safety and Health Administration (OSHA), and United States Army Corps of Engineers (USACE) Engineer Manual (EM) 385-1-1.

The following exhibits describe the safety and health policy and are part of the SES-TECH corporate Environmental, Health and Safety (EHS) Program:

- Environmental Safety and Quality Policy
- Corporate Health and Safety Program Procedures List
- Zero Incident Performance[®] Policy
- Zero Incident Performance[®] Pledge

The corporate statement of safety and health policy is provided in Attachment B along with other applicable corporate safety and health policies.

2.1 Safety and Health Expectations, Incentive Program, and Compliance

2.1.1 Safety Program Goals

SES-TECH corporate management and SES-TECH project management believe that all accidents are preventable through careful planning, tasking, and error-free execution of work. It is SES-TECH policy that everyone is responsible for working safely and for identifying and controlling work place hazards. This is the foundation of the company's Zero Incident Performance (ZIP[®]) philosophy. SES-TECH has adopted ZIP as the central safety goal for the Oceana Salvage Yard Access Road project. A safety goal of anything more than zero is to assume that some co-workers will get hurt.

In pursuing this goal, SES-TECH strives to achieve zero recordable injury cases for the current and subsequent contract years, no property loss events, no first aid cases, and no serious environmental releases (greater than reportable quantity). In achieving this goal, SES-TECH's objective is to post a steady decrease in OSHA Recordable incident rates, days away restricted or treatment (DART) incident rates, and DART severity rates to well below industry averages. SES-TECH also expects EMRs to remain less than 1.0 with a gradual lowering of the rate over time.

2.1.2 Incentive Program

No incentive programs are scheduled for this project.

2.1.3 Resolving Noncompliance Problems

Compliance with the safety and health requirements described in the APP, SSHP, site-specific work rules, project work plans, applicable worker safety regulations, and corporate policies and procedures is a performance requirement on SES-TECH projects. When lapses in compliance occur, the PM will resolve the issue by discussing the problem with the individual or subcontractor directly, and by stating clearly the nature of the deficiency and the steps that need to be taken to correct it. If compliance problems continue to exist, any employee may be terminated and removed from the project.

2.1.4 Management Accountability

To ensure project management is held accountable for safety and health performance, the SES-TECH PM, SES-TECH Program Manager, and SES-TECH executive management will conduct reviews of project performance as needed. If SES-TECH executive management project reviews are conducted, an evaluation of the nature of all incidents and direct feedback on managing health and safety risks will be performed. During these SES-TECH executive management reviews, the means, methods, and lessons learned will be discussed to improve safety and health performance.

During SES-TECH executive management reviews, investigating select safety and health incidents which occurred at job sites assists in developing lessons learned and provides a forum to explore better approaches for correcting any underlying deficiencies, as needed.

2.1.5 Zero Incident Performance[®]

ZIP describes SES-TECH's approach and expectations for both safety and project execution. SES-TECH will achieve this level of performance excellence through teamwork and partnering with our client and our subcontractors, and through the participation of every person on this project. Each employee and

subcontractor employee of SES-TECH has the responsibility to help create and work in a safe and environmentally protective manner to strive for ZIP.

SES-TECH believes that:

All incidents are preventable through proper planning, tasking, and execution of plans as written. Any goal besides Zero Incident Performance[®] is unacceptable and sends the message that incidents cannot be prevented.

In addition, an incident includes an event that could have resulted in one of these outcomes had the circumstances been different (“near miss”).

Each person on this project is individually responsible and accountable for his/her safety performance. Active participation by all personnel is required in order to achieve ZIP. This includes SES-TECH personnel and subcontractor personnel. If an incident does occur, it must be reported and investigated to identify root causes, take corrective actions, and communicate the lessons learned.

Subcontractors’ health and safety record is a key evaluation factor prior to subcontract award. Only subcontractors that meet SES-TECH’s health and safety criteria as specified in SES-TECH’s corporate procedure EHS 1-4 (Attachment C) will be selected to work on-site. Each subcontractor will receive the APP and SSHP as part of the subcontract procurement package, so that their personnel can properly understand the expectations of the project. Subcontractors, after contract award, shall be required to attend a health and safety orientation prior to working on-site. This meeting will involve the subcontractor’s key personnel and will cover ZIP expectations.

3.0 RESPONSIBILITIES AND LINES OF AUTHORITY

SES-TECH is ultimately responsible for the implementation of the EHS Program. This section identifies the roles and responsibilities of SES-TECH personnel conducting activities at the site. The PM and field representatives have the qualifications, training, and experience to safely conduct their respective tasks while providing a safe work environment. Attachment D of this APP includes the resumes of key personnel for the site. These resumes detail the representative project experience, dates of service, training certifications, and other applicable clearances and qualifications for each key site individual.

3.1 Management Accountability

To ensure their accountability for safety and health performance, project management evaluate the nature of all incidents, conduct inspections, and include safety and health performance as a specific performance category in staff annual performance appraisals.

3.2 Project Environmental Safety Manager

The Project Environmental Safety Manager (PESM) helped prepare and approve this APP and any subsequent amendments prior to adoption into the site EHS Program and site EHS documents. The PESM will provide project support on health and safety issues. The PESM will advise the PM regarding industrial hygiene concerns, interpretation and evaluation of analytical exposure data, and other safety related issues, as needed.

The PESM for the Oceana Salvage Yard Access Road project is:

Mr. Roger Margotto, CIH, CSP
Tetra Tech EC, Inc.
1230 Columbia St., Suite 750
San Diego, CA 92101-8536
Office: (619) 471-3503
Cell: (619) 988-0520
roger.margotto@tetrattech.com

3.3 Project Manager

The PM ensured that the APP and SSHP were prepared, reviewed, and approved. The PM also will ensure the APP and SSHP are implemented. During the course of the project, the PM will review and approve any subsequent amendments prior to adoption into the APP, site EHS Program, and/or site EHS documents. The PM is responsible for the overall health and safety performance and compliance with applicable regulations.

The PM will ensure that the competent person requirements for underground utilities and excavation and trenching are met.

The PM for the Oceana Salvage Yard Access Road project is:

Mr. John Dormi
Sealaska Environmental Services, LLC
Twin Oaks 1
5700 Lake Wright Drive, Suite 309
Norfolk, VA 23502
Cell: (757) 685-9566
john.dormi@sealaska.com

3.4 Site Safety and Health Officer

The Site Safety and Health Officer (SSHO) is Jerrett Patterson. The SSHO will be present during the conduct of site operations and possesses the knowledge and experience necessary to implement all elements of the approved plans. The qualifications of the SSHO for this project included a minimum of 5 years of experience and the successful completion of the SES-TECH Environmental Safety Supervisor (ESS) course. This course includes completion of 30 hours of web-based training in Construction Safety (and 16 hours of instructor-led training by senior EHS staff member). The SSHO requirements also include the completion of the 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training and annual 8-hour HAZWOPER refresher training.

The SSHO for the Oceana Salvage Yard Access Road project is:

Jerrett Patterson
1050 NE Hostmark St.
Ste. 202
Poulsbo, WA 98370
Cell: (360) 434-5449
Jerrett.patterson@tetrattech.com

The SSHO will implement this APP and the SSHP in the field. The SSHO authority and responsibilities include, but are not limited to, the following:

- Acts as designated site competent person for excavation and trenching
- Acts as designated site competent person for underground utilities
- Executes the means for control of subcontractors as described in Section 4.2 of this APP
- Ensures that site personnel provide adequate and applicable training documents certifying an individual's qualification to work at the site
- Ensures that all health and safety activities for SES-TECH personnel and its subcontractors are identified in the SSHP and are conducted in compliance with the SSHP
- Conducts pre-task safety and health analysis
- Conducts and documents safety briefings and site orientations (as necessary)
- Ensures that monitoring instruments are properly calibrated and maintains health and safety field log books
- Directs and coordinates health and safety monitoring activities and ensures that the proper personal protective equipment (PPE) is used by field teams
- Upgrades or downgrades PPE based on site conditions and/or real-time monitoring results
- Identifies operational changes that require modifications to health and safety procedures and the SSHP, and ensures that any procedure modifications are approved by the PESM and documented
- Conducts weekly and monthly inspections and reports to the PESM to provide summaries of field operations and progress
- Performs emergency coordinator duties and ensures that adequate emergency response preparation and procedures, as well as emergency response equipment, are maintained
- Notifies the PESM of accidents/incidents, and coordinates and completes investigation reports with the PM
- Ensures that personnel have the necessary training and fit testing for the use of each type of respirator and ensures that proper documentation is available
- Ensures that PPE is maintained and inspected in accordance with the EHS plans and program requirements
- Evaluates the effectiveness of the respiratory protection program on each site
- Recommends changes to the types of PPE being used, as necessary

3.5 Alternate Site Safety and Health Officer

The alternate SSHO is Stavros Patselas. The alternate SSHO will be present on-site during the conduct of field operations when the SSHO is not on-site and is responsible for all health and safety activities. The alternate SSHO possesses the knowledge and experience necessary to ensure that all elements of the approved SSHP are implemented and enforced on-site. The alternate SSHO will be present during the

conduct of site operations and possesses the knowledge and experience necessary to implement all elements of the approved plans.

Alternate SSHO qualifications for this project include the successful completion of the SES-TECH ESS course. This course includes completion of 30 hours of web-based training in construction safety (and 16 hours of instructor-led training by senior EHS staff). The alternate SSHO requirements also include the completion of 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training and annual 8-hour HAZWOPER refresher training.

The alternate SSHO will implement the APP and the SSHP in the field. The alternate SSHO authority and responsibilities are the same as listed for the SSHO in Section 3.4.

The alternate SSHO for the Oceana Salvage Yard Access Road project is:

Stavros Patselas
Tetra Tech EC, Inc.
820 Town Center Dr., Ste 100
Langhorne PA 19047
Cell: (267) 688-9967
Stavros.patselas@tetrattech.com

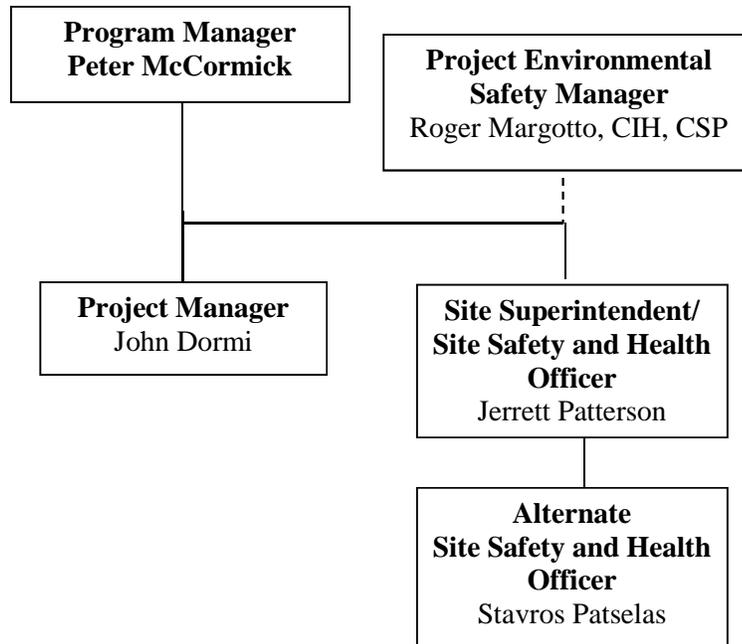
3.6 Site Personnel/Work Parties

The responsibilities of site personnel and work parties include the following:

- Report any unsafe or potentially hazardous conditions to the SSHO.
- Maintain knowledge of the information, instructions, and emergency response actions contained in the SSHP.
- Comply with rules, regulations, and procedures as set forth in this SSHP and any revisions.
- Prevent admittance to work sites by unauthorized personnel.
- Inspect all tools and equipment, including PPE, daily prior to use.
- Act as safety leaders.
- Implement the ZIP procedure.

3.7 Lines of Authority

PROJECT ORGANIZATION CHART



4.0 SUBCONTRACTORS AND SUPPLIERS

4.1 Identification of Subcontractors and Suppliers

All SES-TECH employees and all subcontractors working on the Oceana Salvage Yard Access Road site will be required to comply with applicable OSHA, USACE EM 385-1-1, APP, and SSHP requirements.

This APP recognizes that projects such as this require involvement of subcontractors and suppliers. All subcontractors will be evaluated and approved according to the provisions of SES-TECH Procedure EHS 1-4. This procedure involves the examination of potential subcontractors relative to prior EHS performance, including a review of incident rates, OSHA 300 logs, and OSHA violation history. SES-TECH Procedure EHS 1-4 is included in Attachment C.

4.2 Means for Controlling and Coordinating Subcontractors

Once on-site, SES-TECH will control and provide direction to the subcontractor through the project contract, site plans, site-specific orientation, daily safety briefings, and by providing on-site direction to the subcontractor supervisor regarding tasks to be performed and the manner in which they are to be performed. SES-TECH management is responsible for making sure subcontractor employees review and follow the policies, procedures, and requirements of this APP and the SSHP.

SES-TECH's SSHO will ensure subcontractor accountability and compliance with site health and safety requirements by:

- Providing the APP and SSHP with the subcontract procurement package to each subcontractor.
- Reviewing subcontractor training records for compliance and appropriate updates.
- As applicable, reviewing the subcontractor’s health and safety plan to ensure compliance with the SES-TECH SSHP.
- Providing each subcontractor employee with a site-specific safety and health training/orientation, during which the requirements of the APP and SSHP will be discussed. Included in the training will be use of the appropriate PPE.
- At conclusion of site-specific safety and health training, having each subcontractor employee sign the Field Personnel Review sheet found in Section 15.0 of the SSHP.
- Conducting daily health and safety briefings with subcontractors.
- Monitoring and assessing subcontractor compliance with the APP and SSHP by performing periodic oversight of subcontractor work areas and subcontractor employees, as well as periodic meetings with the subcontractor’s representative.
- Holding the subcontractor accountable for compliance with APP and SSHP requirements.
- When lapses in compliance occur, resolving the issue by discussing the problem with the subcontractor employee or subcontractor representative directly.
- Clearly stating the nature of the deficiency and the steps that need to be taken to correct it.
- If compliance problems continue to exist, giving the subcontractor a “stop work” order until the subcontractor’s employee is removed from the project.

Hazards not listed in this APP, but known by the subcontractor or known to be associated with a subcontractor’s specialty, must be identified and addressed prior to beginning work. SES-TECH has the authority to immediately suspend field activities when observing unsafe conditions or in the event of an imminent safety hazard or potentially dangerous situation.

4.3 Safety Responsibilities of Subcontractors and Suppliers

SES-TECH subcontractors are responsible for:

- Acknowledging receipt of this plan and the hazard communication briefing
- Providing their personnel with appropriate PPE as specified by SES-TECH and their safety plan
- Fulfilling the requirements established by this plan
- Ensuring that their employees are properly trained and are in compliance with applicable regulations
- Allocating sufficient time, materials, and equipment to safely complete activities in accordance with this APP and the SSHP
- Providing their company-specific safety and health programs and AHAs to SES-TECH, as applicable and as required

5.0 TRAINING

Prior to on-site work, workers will attend a site-specific safety and health training/orientation. Additionally, prior to on-site work, the following mandatory training is required in accordance with 29 *Code of Federal Regulations* (CFR), Part 1910.120:

- 40-hour OSHA HAZWOPER training
- Current 8-hour OSHA HAZWOPER refresher certificate

Periodic safety and health update training shall be maintained current. For example, the 8-hour OSHA HAZWOPER refresher training class shall be taken annually by employees and supervisors. Resumes for site personnel, which include Certificates of OSHA Training shall be obtained for site personnel prior to performance of work, when required.

The following sections identify other required training associated with this project.

5.1 Site-Specific Training and Orientation

The SSHO provides site-specific training/orientation to all personnel (including subcontractors) assigned to the site and will highlight all provisions contained within the APP and SSHP. This training/orientation will specifically address procedures, training and use of PPE, monitoring, site layout, identified hazards, local emergency support services, emergency response, hazard communication training, and equipment used for the hazard identification and control. Site-specific training/orientation will also allow field workers the opportunity to clarify any issue or direction they do not understand. This training/orientation also serves to reinforce their responsibilities regarding safety and health aspects for their particular activity. Additional worker training, if required for completion of field tasks, will be provided to each SES-TECH or subcontractor employee. This project requires lead awareness training as required by 29 CFR 1926.62. Although it is not a lead abatement project, this project requires removal of hazardous waste that contains high concentrations of lead.

5.2 Daily On-Site Safety Briefings

Project personnel (including subcontractors) and visitors are provided initial and daily on-site health and safety briefings by the SSHO, or qualified designee, to assist site personnel in safely conducting their work activities. This training will be conducted prior to the start of new work activities using AHAs. The briefings will include information on new operations to be conducted, PPE to be used, changes in work practices, or changes in the site's environmental conditions. The briefings will also provide a forum to facilitate conformance with safety requirements, and identify performance deficiencies related to safety during daily activities or as a result of safety inspections.

5.3 First Aid and CPR

The closest emergency care facility to the Oceana Salvage Yard Access Road site is the Sentara Virginia Beach General Hospital located at 1060 First Colonial Road in Virginia Beach, VA. A map to Sentara Virginia Beach General Hospital is included as Figure 3.

During normal site operations, two persons will be designated a full-time first aid and cardiopulmonary resuscitation (CPR) trained individual. The SSHO is trained and qualified to provide on-site first aid and CPR.

6.0 SAFETY AND HEALTH INSPECTIONS

SES-TECH will perform EHS inspections, as applicable, to assess site conditions and verify compliance with applicable laws and regulations. The SSHO will perform daily inspections of work area. The task manager or designee will perform inspections as practicable. The PESM may perform an unannounced inspection at any time.

- Informal daily inspections are performed by SSHO.
- Any deficiencies on daily inspections are noted on a Deficiencies Log as required by EM 385-1-1, Section 01.A.12d.
- PM inspections may be delegated to a qualified individual and will be performed as practicable and observations documented.
- Inspections will be tracked for deficiencies and follow-up action.
- The task manager may conduct an unannounced inspection at any time.

7.0 ACCIDENT REPORTING

Worker and subcontractor accident/incident exposure data and hours worked are reported monthly by the SSHO to the PESM. SES-TECH Procedure EHS 1-7, Event Reporting and Investigation (Attachment C), details the procedures and the forms used by SES-TECH for event investigation. When an incident occurs, the SSHO will immediately notify the PM and PESM, and the PM will notify the contract Program Manager. If the incident is an OSHA recordable injury or exceeds \$20,000 in property damages, the PM will immediately notify the Remediation Project Manager (RPM) and the Facilities Engineering and Acquisition Division (FEAD).

The current NAVFAC EMAC Contract RPM is Krista Parra. The NAS Oceana FEAD representative is Harold Bishop.

After the event report of incident is completed, the SSHO must submit a draft written SES-TECH event report within 24 hours. Within 10 days of occurrence, a completed investigation report must be submitted to the PESM. All reports are reviewed by the PM and the PESM. Within the reporting system, corrective actions and persons responsible for those corrective actions are identified. The system requires follow-up to ensure completion of corrective actions.

Reports of applicable accidents or incidents shall be made to the RPM/FEAD as soon as possible, but not more than 24 hours after occurrence. The PM or the SSHO will complete an Incident Notification as required for any OSHA recordable injury. Investigation and corrective actions shall be submitted to RPM/FEAD no later than 5 working days following the incident. Corrective actions shall be implemented as soon as reasonably possible.

The PM or the SSHO will immediately notify the RPM/FEAD if any of the following occurs:

- A fatal injury
- A permanent total disability
- A permanent partial disability
- The hospitalization of three or more people resulting from a single occurrence

- Property damage of \$20,000 or more

8.0 MEDICAL SUPPORT

SES-TECH uses a board-certified Occupational Health Physician and a network of clinics that are arranged by SES-TECH's corporate occupational medical service provider to monitor and treat injuries and provide medical clearance in accordance with OSHA 29 CFR 1910.120. All personnel assigned to the project must have a current medical certification to indicate fitness for duty, clearance to wear PPE, and identification of any work restrictions. The exam must have been performed annually or biennially depending on the decision of the corporate medical provider.

On-site medical support (in the form of first aid and CPR) is provided by the SSHO.

The closest civilian medical emergency/urgent care facility is the Sentara Virginia Beach General Hospital located at 1060 First Colonial Road in Virginia Beach, VA, which has been identified as the primary medical facility for the site. A route map to the Sentara Virginia Beach General Hospital is included as Figure 3. The SSHP provides additional information regarding on-site medical support program. Off-site medical support (nonemergency care) is provided by the I&O Medical Center, an occupational work care clinic.

Primary EMERGENCY/URGENT Care Facility:

Sentara Virginia Beach General Hospital
1060 First Colonial Road
Virginia Beach, VA 23454
(757) 395-8000

Nonemergency/Occupational Care Facility:

I&O Medical Center
1290 Diamond Springs Road
Virginia Beach, VA 23455
(757) 460-0700

The SSHP identifies the I&O Medical Center work care clinic as the principal occupational medical care facility. A map to the I&O Medical Center work care clinic is included as Figure 4.

9.0 PERSONAL PROTECTIVE EQUIPMENT

As indicated in the SSHP, the PESM conducted hazard assessments and specified the level of PPE required for each of the planned tasks. When/if a new activity is identified during the project, the SSHO or the PM will contact the PESM for task evaluation, performance of a hazard assessment, identification of appropriate PPE, and writing and/or approval of the AHA.

The SSHO will be responsible for ensuring that all personnel comply with the PPE requirements outlined in this section. Table 6-1 of SSHP specifies required PPE for each on-site activity. The CIH signature in the SSHP constitutes certification of the hazard assessment. Modifications to initial PPE selection may be made by the SSHO with approval of the PESM.

Hazard assessments were conducted by the PESM and SSHO using the AHA form. The PPE described in this section for the indicated protection levels meets American National Standard Institute standards or equivalent.

SES-TECH is not responsible for providing any PPE equipment, as described herein, to subcontractor employees. Employees of subcontractors must arrive on-site with their individually assigned PPE.

Training in the selection, use, and maintenance of PPE is covered in the following prerequisite courses:

- Site-specific safety and health training/orientation
- 40-hour OSHA HAZWOPER training
- 8-hour OSHA HAZWOPER annual refresher

If any worker demonstrates, through word or action, a lack of understanding in required training or the use and/or limitations (etc.) of PPE, that individual will receive additional site-specific safety and health training/orientation from the SSHO.

Attachment D of the APP includes the resumes of key personnel for the site. These resumes detail the representative project experience, dates of service, training certifications, and other applicable clearances and qualifications for each key site individual.

Work practices that do not meet requirements of the APP/SSHP, as observed by the SSHO, will be immediately addressed through various means such as:

- Discussion with employee
- Investigation of the situation
- Retraining (as necessary)

10.0 PLANS (PROGRAMS, PROCEDURES) REQUIRED BY THE SAFETY MANUAL (AS APPLICABLE)

SES-TECH has written programs that provide specific direction for compliance with OSHA requirements, USACE regulations, and implementation of SES-TECH policy to prevent accidents and injuries. This section describes how some of these programs are implemented specifically for this project.

10.1 Layout Plans

This project will not erect any temporary facilities. The primary function of the project is to excavate contaminated soil. The layout of the site is identified in the Site Layout Plan included as Figure 2.

10.2 Emergency Response Plans

Emergency response has been planned for injuries, explosions and fires, accidents and severe weather. Information regarding Emergency Response Plan for spills is included in the SSHP.

The Emergency Response Plan includes the following:

- Emergency response procedures will be reviewed during the site specific safety and health training/orientation.
- If deemed necessary by the PESM, an Emergency Response Drill will be performed and a critique documented.
- Evacuation route is: **To be determined by SSHO upon mobilization.**
- The rally point for the emergency evacuation of the site is: **To Be Determined by SSHO upon mobilization.**
- The SSHO will conduct a head count at the rally point to account for any staff on-site (if any).
- The evacuation route and rally point information will be kept on-site in the Support Zone and in the site vehicles.
- The SSHO is first aid and CPR trained, as is the Emergency Coordinator.
- In the event of an emergency, the SSHO will contact Emergency Medical Services or other applicable emergency services.
- Emergency Medical Services and other important emergency site contact telephone numbers are included in Table 10-1 of this APP.
- The emergency contact numbers will be kept on-site in the Support Zone and in the site vehicles.
- The SSHO will contact Emergency Response Services and verify telephone numbers at mobilization and annually.
- All emergencies shall be reported immediately to the SSHO.
- The SSHO will immediately report all emergencies to the PM.
- Effectiveness of the Emergency Response Plan will be evaluated by the PESM.
- Prior to the start of any new task, a hazard evaluation will be performed, which will include an assessment of any additional emergency response requirements not previously identified.
- Any additional emergency response requirements will be reviewed and approved by the PM and the PESM.

Additional information regarding Emergency Response Plans is included in the SSHP (Attachment A).

10.3 Emergency Response – Fire Fighting Plan

In the unlikely event of a fire or explosion, emergency response procedures will include:

- Immediately evacuating the site
- Assembling at the designated rally point
- Notifying local fire and police departments (by dialing 911)

No personnel will fight a fire beyond the incipient stage unless trained in the proper use of fire extinguishers and if the fire can be put out with a portable extinguisher in 30 seconds or less (incipient stage).

Adhering to the following precautions will prevent fires:

- Maintain good housekeeping and properly store flammable materials.
- Permit smoking only in areas designated by the SSHO.
- Perform monthly inspections of fire extinguishers.

A map of all fire extinguisher locations will be located in the site vehicles. The person responsible for the maintenance of fire prevention and/or fire suppression equipment is the site SSHO.

Additional information on fire fighting and emergency response is included in the SSHP (Attachment A).

10.4 Emergency Telephone Numbers

Table 10-1 is the list of emergency contact numbers, which will be kept on-site in the Support Zone and in the site vehicles.

Additional Emergency Response Plan information (as defined by 29 CFR 1910.120) is included in Section 12.0 of the SSHP (Attachment A).

10.5 Man Overboard/Abandon Ship

Not applicable.

10.6 Medical Support Plan

See Section 8.0 of this APP.

Table 10-1 Emergency Contact Numbers

Contact	Agency or Company	Telephone Number
Police	City of Virginia Beach	911
Fire	City of Virginia Beach	911
Ambulance	City of Virginia Beach	911
Hospital – EMERGENCY Sentara Virginia Beach General Hospital	1060 First Colonial Road Virginia Beach, VA 23454	(757) 395-8000
Work Care Clinic – NONEMERGENCY I&O Medical Center	1290 Diamond Springs Road Virginia Beach, VA 23455	(757) 460-0700
Dr. Peter Greaney	Work Care (Occupational doctor)	(800) 455-6155
Poison Control Center	National Contact	(800) 222-1222

Contact	Agency or Company	Telephone Number
National Response Center	National Contact	(800) 424-8802
Krista Parra	NAVFAC EMAC RPM	(757) 341-0395
Harold Bishop	NAS OCEANA FEAD	(757) 342-4295
John Dormi Project Manager	SES -TECH Norfolk, VA Office	Cell: (757) 685-9566
Jerrett Patterson Site Superintendent/Site Safety and Health Officer	SES -TECH Poulsbo, WA Office	Cell: (360) 434-5449
Roger Margotto, CIH, CSP Project Health and Safety Manager	SES-TECH San Diego, CA Office	Office: (619) 471-3503 Cell: (619) 988-0520

10.7 Plan for Prevention of Alcohol and Drug Abuse

All contractors and subcontractors on this project are subject to drug and alcohol testing at any time. Supervisors, managers, and the SSHO are to determine the fitness of their workers including whether their workers may be under the influence of any drugs or alcohol. This includes over-the-counter medications and prescription medications. At the beginning of the project at the initial site orientation and training, all workers are reminded of the program and policies. The policy is also described in the work rules. Workers are encouraged to confidentially list their medications on a medical information form that is provided to them by the SSHO. If a worker is involved in an accident or is injured, the worker(s) involved may be asked to be drug tested. If a supervisor observes any worker who appears to be under the influence of drugs or alcohol, the supervisor may request testing of the worker.

SES-TECH Procedure PP-14, Substance Abuse Program (Previously Drug and Alcohol Abuse), is included in Attachment C.

10.8 Site Sanitation Plan

Portable toilet facilities will be brought on-site at mobilization, will be regularly maintained for the duration of on-site activities, and will be removed at demobilization.

Workers will discard all food debris and other trash in a designated container for ultimate disposal by a licensed waste hauler to an approved waste management facility.

10.9 Access Haul Road Plan

Not applicable.

10.10 Respiratory Protection Plan

The PESM is responsible for selection and specification of PPE in accordance with the requirements of this program: EHS 5-1, Personal Protective Equipment (Attachment C); EHS 3-2, Procedures – Environmental Health and Safety Plan(s) (Attachment C); and applicable regulations.

All respiratory equipment used on SES-TECH projects shall be certified by the National Institute for Occupational Safety and Health/Mine Safety and Health Administration. The type of respiratory protection selected is based upon potential hazards at a specific site. Selection of appropriate respiratory protection is documented in the EHS plans (see PO-1, Project Management Planning, in Attachment C), and approved by a CIH.

Site personnel shall meet the medical surveillance requirements of OSHA 29 CFR 1910.134, 1910.120, and EHS 4-5, Medical Screening and Surveillance (Attachment C), for respirator use prior to engaging in any fieldwork requiring or potentially requiring the use of a respirator. Personnel with medical conditions that prevent or limit their ability to wear a respirator shall be notified in writing by the management team.

Personnel required to use respiratory protection shall be trained in the selection, use, and maintenance of the equipment. Respiratory protection training is included as part of the initial health and safety training, the 8-hour refresher course, and the site-specific training described in EHS 1-11 (Attachment C).

This project may require the use of full-face respirators with P-100 cartridges. This protection is required if dust control cannot be maintained during the removal of lead-contaminated soil.

10.11 Real-Time Air Monitoring

There is no instrument that measures total dust in real time. Respirable aerosol monitors (RAMs) do not measure total dust. The respirable fraction is not sufficient to establish exposure. Total dust control on this project is required because the nonrespirable fraction of the dust also contains lead, which can be inhaled into the respiratory tract. Although not inhaled into the lungs, the lead presents an ingestion hazard as the material is coughed out and swallowed.

Even if used, the RAM would not have the sensitivity necessary and would not be sufficient to measure the potential exposure to the high levels of lead that are present in the soil.

For on-site activities, dust control is essential. If dust is not controlled sufficiently, personnel will be required to wear a full-face air purifying respirator outfitted with P-100 cartridges.

Additional information on the Respiratory Protection Program is included in the SSHP (Attachment A).

SES-TECH Procedure EHS 5-2, Respiratory Protection, is included in Attachment C.

10.12 Health Hazard Control Plan

Health hazard control is achieved through the AHA. The AHA is a systematic way of identifying the potential health and safety hazards associated with major phases of work. The AHA identifies the methods to mitigate and eliminate exposure to chemical and biological hazards. The AHA also identifies the necessary equipment, training, and inspections required to control each potential hazard.

The AHAs are developed through task analysis. Task analysis is a detailed, systematic, step-by-step examination of a task to identify all potential loss exposures. The AHA then provides control measures required to prevent losses for each identified hazard. The control measures section includes references to applicable SES-TECH programs and procedures and should specify equipment, inspections, and training requirements.

The AHA is documented in a format that includes the following elements:

- A statement that the AHA serves as a certification of hazard assessment
- A review and approval by a CIH or other competent person
- Identification of the workplace and activity evaluated
- Identification of the person certifying the analysis has been performed
- Identification of the date of the hazard evaluation
- Identification of operations, materials, and equipment involving potential exposure to hazardous substances

At the Oceana Salvage Yard Access Road site, chemical, physical, and biological health hazards and controls are addressed in the AHAs.

AHAs are reviewed with personnel during site specific training/orientation and/or before beginning a new phase task.

10.13 Hazard Communication Program

Only materials brought onto the site are covered by the Hazard Communication Program. When any material or chemical is brought onto the site, material safety data sheets (MSDSs) will be provided to the SSHO. An MSDS file will be generated and maintained by the SSHO.

As part of initial site safety and health training/orientation, the SSHO will review the Hazard Communication Program and MSDSs with site workers and will keep MSDSs in a file in the designated site vehicle. Lead exposure is the primary chemical hazard associated with the site. All personnel will receive lead awareness training.

MSDSs for new products brought onto the site will be included in tailgate safety and health briefings.

All portable containers will be properly labeled as to content and hazards of the material in the container.

SES-TECH Procedure EHS 4-2 is used as a reference for hazard communication and training and is included in Attachment C.

Additional detailed information pertaining to the Hazard Communication Program is provided in the SSHP (Attachment A).

10.14 Process Safety Management Plan

Not applicable.

10.15 Lead Abatement Plan

Not applicable. However, the project requires the removal of soil contaminated with lead, and certain requirements of 29 CFR 1926.62 apply to ensure that workers are not exposed to lead at concentrations above the established permissible exposure limit.

10.16 Asbestos Abatement Plan

Not applicable.

10.17 Radiation Safety Program

Not applicable.

10.18 Abrasive Blasting Plan

Not applicable.

10.19 Heat/Cold Stress/Temperature Extremes

There is a potential for injuries related to heat stress/cold stress during work activities at this site. Proper training and preventive measures will aid in averting loss of worker productivity and serious illness.

There is the potential for work to be performed at the Site during temperature extremes. SES-TECH Procedure EHS 4-6 is included in Attachment C.

Additional information pertaining to heat stress/cold stress/temperature extremes is provided in the SSHP (Attachment A).

10.20 Crystalline Silica Monitoring Plan

Not applicable.

10.21 Night Operations Lighting Plan

Not applicable.

10.22 Fire Prevention Plan

Workers will not fight any fires other than incipient stage fires. The primary work area is outside along the Oceana Salvage Yard Access Road and adjacent areas. Fires on the project site that could occur would be related to the refueling trucks, vehicles, and equipment used on-site. There will be at least one 10-pound ABC dry chemical fire extinguisher located near the work area(s). A fire extinguisher is also required to be mounted on every piece of heavy equipment (10 B:C dry chemical) (EM 385-1-1 18.G.23).

The fire extinguishers are intended to be used only for fires in the incipient stage that can be reasonably extinguished with a single fire extinguisher. In no case will workers attempt to fight any fire that cannot be reasonably extinguished within 30 seconds to 1 minute. The fire extinguishers have only enough dry chemical agents to extinguish small fires. Prior to fighting any fire or during the course of fighting a fire, workers will call the City of Virginia Beach Fire Department by dialing 911.

All areas where flammable gases are stored shall be posted as FLAMMABLE, NO SMOKING. Flammable liquids will be stored in an approved flammable liquids storage cabinet. Smoking is allowed only in areas designated by the SSHO.

In the event of a fire or explosion, site personnel should summon the Virginia Beach Fire Department immediately (by dialing 911), take a head count, and implement site evacuation procedures. Site personnel should initiate fire suppression with fire extinguishers if safe to do so. Any fire must be reported to the PM and the PESM after emergency services are notified.

Additional information on fire prevention is provided in the SSHP (Attachment A).

10.23 Wild Land Fire Management Plan

Not applicable.

10.24 Hazardous Energy Control Plan

Hazardous energy for underground utilities will be controlled by implementing the SES-TECH Procedure EHS 3-15, Underground Utilities. EHS 3-15 contains information on the identification and marking of underground utilities prior to excavation activities. As part of EHS 3-15, the State of Virginia One-Call system will be contacted, and a third-party underground geophysical survey will be performed to identify and report for marking any below-grade service lines.

Additional information on control of hazardous energy is included in the SSHP (Attachment A).

SES-TECH Procedure EHS 3-15, Underground Utilities, is included in Attachment C.

10.25 Critical Lift Plan

Not applicable.

10.26 Contingency Plan for Severe Weather

In the event of severe and/or adverse weather conditions, the SSHO or designee will determine if work can continue without potentially risking the safety of workers.

Some of the items to be considered prior to determining if work should continue are:

- Treacherous weather-related working conditions (e.g., hail, rain, snow, ice, high winds)
- Limited visibility (e.g., fog)
- Potential for electrical storms

The SSHO will determine the need to cease field operations or observe daily weather reports and evacuate, if necessary, in case of severe inclement weather conditions.

10.27 Posting of Emergency Telephone Numbers

Table 10-1 is the list of emergency contact numbers, which will be kept on-site in the Site Superintendent/SSHO vehicle. Additional Emergency Response Plan information (as defined by 29 CFR 1910.120) is included in Section 12.0 of the SSHP (Attachment A).

10.28 Float Plan

Not applicable.

10.29 Site-Specific Fall Protection and Prevention Plan

Not applicable.

10.30 Demolition Plan

Not applicable.

10.31 Excavation and Trenching Plan

The control of hazards associated with excavation will be executed using SES-TECH Procedure EHS 6-3, Excavation and Trenching. Procedure EHS 6-3 contains information on the requirements governing activities in and around excavations and trenches, as well as the requirements for the selection and use of protective systems. Excavations will not exceed 4 feet in depth. Therefore, there are no trenches being constructed for this project.

Additional information on excavation and trenching is included in the SSHP (Attachment A).

SES-TECH Procedure EHS 6-3, Excavation and Trenching, is included in Attachment C.

10.32 Emergency Rescue (Tunneling)

Not applicable.

10.33 Underground Construction Fire Prevention and Protection Plan

Not applicable.

10.34 Compressed Air Plan

Not applicable.

10.35 Formwork and Shoring Erection and Removal Plan

Not applicable.

10.36 Pre-cast Concrete Plan

Not applicable.

10.37 Jacking Plan (Lift) Slab Plan

Not applicable.

10.38 Steel Erection Plan

Not applicable.

10.39 Site Safety and Health Plan

A separate SSHP, meeting the criteria of EM 385-1-1 and of OSHA 29 CFR 1910.120, is included as Attachment A.

10.40 Blasting Plan

Not applicable.

10.41 Diving Plan

Not applicable.

10.42 Confined Space

Not applicable.

11.0 SITE-SPECIFIC HAZARDS AND CONTROLS RISK MANAGEMENT PROCESSES

11.1 Activity Hazard Analysis

The AHAs for the planned activities are included in the SSHP and are also listed in Table 11-1. If any new tasks are identified or if planned activities vary from the written AHA, the SSO will develop or alter the existing AHAs with the assistance of the workers to address the specific activities. All AHAs will be reviewed by the PESH.

Table 11-1 Activity Hazard Analysis List

AHA No.	Tasks Requiring AHAs
1	Mobilization (including site preparation and erosion control installation)
2	Geophysical and Geographical Surveys
3	Clearing and Grubbing (including chain saw and chipper utilization)
4	In-situ Chemical Stabilization Treatment, Soil Excavation and Soil Management (including truck loading and waste management)
5	Post-treatment Soil Sampling, Confirmatory Soil Sampling and Barrier Fabric Placement
6	Backfill of Excavation and Regrading
7	Gravel Placement and Asphalt Cap Installation
8	Restoration (including grass seeding)
9	Demobilization (including equipment decontamination)

11.2 Contractor Risk Management Procedures

SES-TECH will meet the applicable sections of EM 385-1-1. At a minimum, the SES-TECH corporate procedures listed in Table 11-2 meet the minimum requirements and are specifically addressed in the SSHP. This database of corporate procedures is available to SES-TECH employees via the internet and hard-drive computer files. Additionally, any of these procedures can be obtained by contacting the PESM or the PM.

Table 11-2 lists the task requirement and the corresponding SES-TECH corporate procedures referred to in the APP.

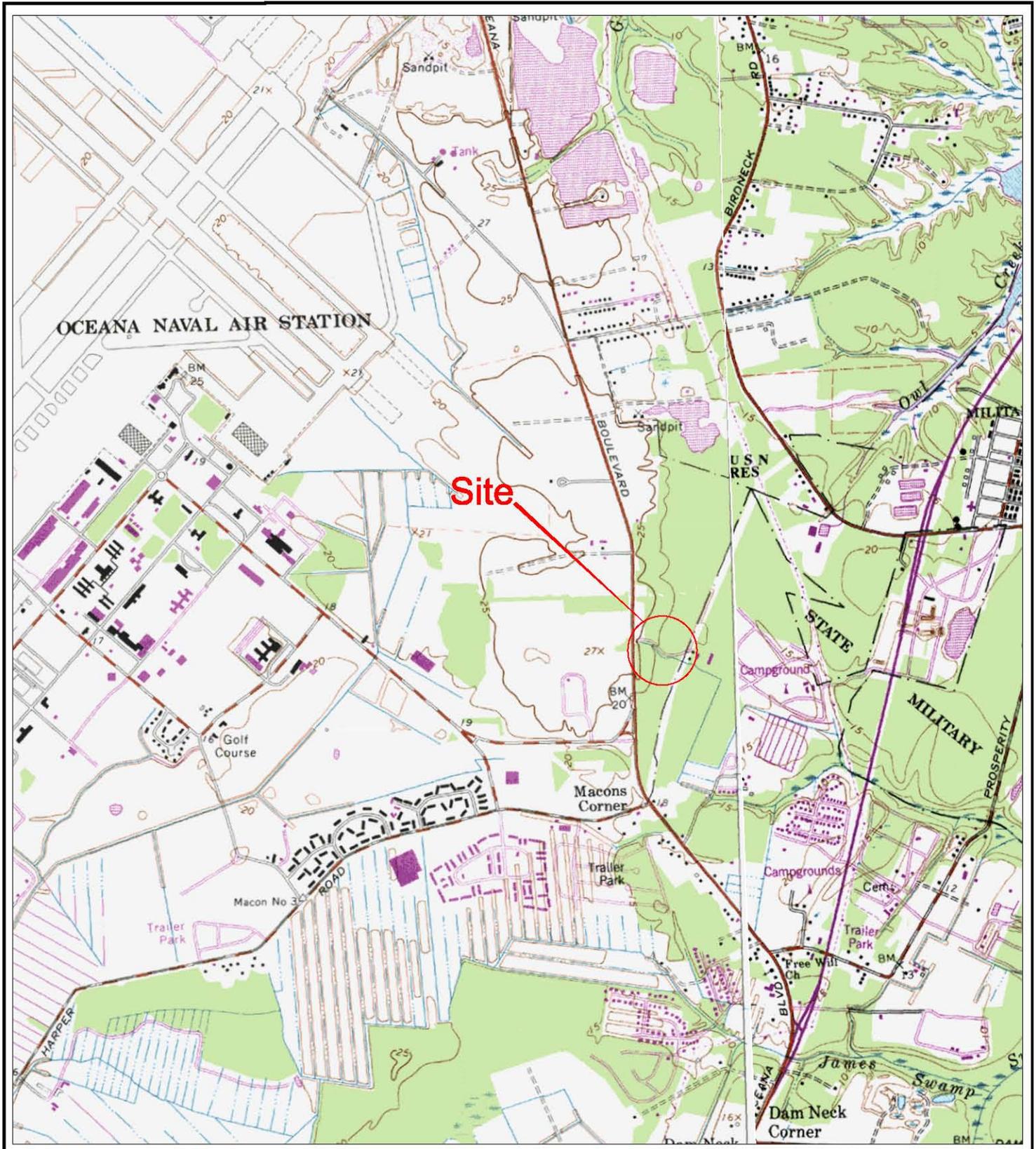
All SES-TECH corporate procedures that are referenced in this APP are included in Attachment C.

Table 11-2 SES-TECH Corporate Procedures Attached to Accident Prevention Plan

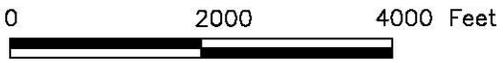
Requirement	SES-TECH Procedure
Project Management	PO-1: Project Management Planning
Control of Subcontractors	EHS 1-4: Subcontractor Selection and Management
Accident Reporting	EHS 1-7: Event Reporting and Investigation
Health Hazard Control	EHS 1-11: Training
Health Hazard Control	EHS 3-2: Procedures – Environmental Health and Safety Plan(s)
Health Hazard Control	EHS 3-15: Underground Utilities
Hazard Communication Program	EHS 4-2: Hazard Communication
Health Hazard Control	EHS 4-5: Medical Screening and Surveillance
Health Hazard Control	EHS 4-6: Temperature Extremes
Health Hazard Control	EHS 5-1: Personal Protective Equipment
Health Hazard Control	EHS 5-2: Respiratory Protection
Health Hazard Control	EHS 6-3: Excavation and Trenching
Health Hazard Control	HSG 1-1: Air Sampling Pumps
Health Hazard Control	PP-14: Substance Abuse Program

FIGURES

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Quadrangle Location Map



Source: U.S.G.S. Topographic Maps (7.5 Minute)
Princess Anne & Virginia Beach, VA Quadrangles

NAVFAC MID-ATLANTIC
Hampton Roads RAO LTM EMAC
NAS Oceana, Virginia Beach, VA
Oceana Salvage Access Road
Removal Action & Asphalt Cap

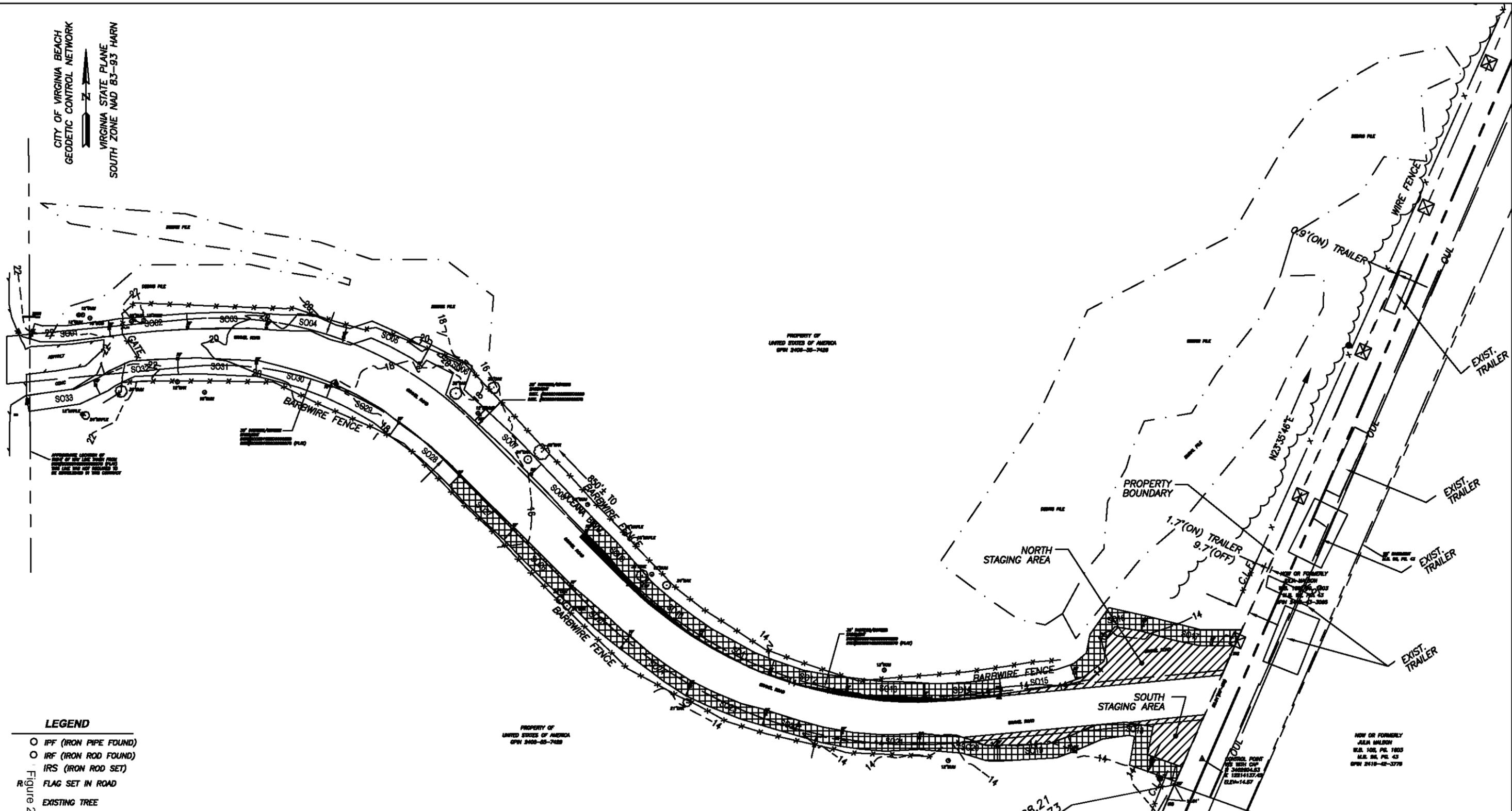
Figure 1
Site Location Map

SES-TECH Atlantic

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CITY OF VIRGINIA BEACH
 GEODETIC CONTROL NETWORK
 VIRGINIA STATE PLANE
 SOUTH ZONE NAD 83-93 HARN

OCEANA BOULEVARD
 VARIABLE WIDTH R/W



LEGEND

- IPF (IRON PIPE FOUND)
- IRF (IRON ROD FOUND)
- IRS (IRON ROD SET)
- Figure 2 FLAG SET IN ROAD
- EXISTING TREE
- TELEPHONE PEDESTAL
- PROPOSED EXCAVATION GRID
- STAGING AREA
- GRID CELL EXTENDED TO MATCH NEW ROAD
- SO19 EXCAVATION CELL I.D.
- TRANSMISSION LINE POLE

NOTES:

1. SURVEY PERFORMED BY MICHAEL SURVEYING & MAPPING P.C., 735 THIMBLE SHOALS BLVD., SUITE 130, NEWPORT NEWS, VA 23606.
2. HORIZONTAL COORDINATE INFORMATION IS BASED ON CITY OF VIRGINIA BEACH GEODETIC CONTROL NETWORK, VIRGINIA STATE PLANE COORDINATE SYSTEM, SOUTH ZONE NAD 83-93 HARN.
3. THIS PLAT IS BASED ON A CURRENT FIELD BOUNDARY SURVEY OF A PORTION OF PROPERTY LINE SHOWN.



N 3462588.21
 E 12214119.73
 TO R CORNER

NAVFAC MID-ATLANTIC Hampton Roads RAO LTM EMAC
NAS Oceana, Virginia Beach, VA Oceana Salvage Access Road Removal Action & Asphalt Cap
Figure 4 Site Layout Map
SES-TECH Atlantic

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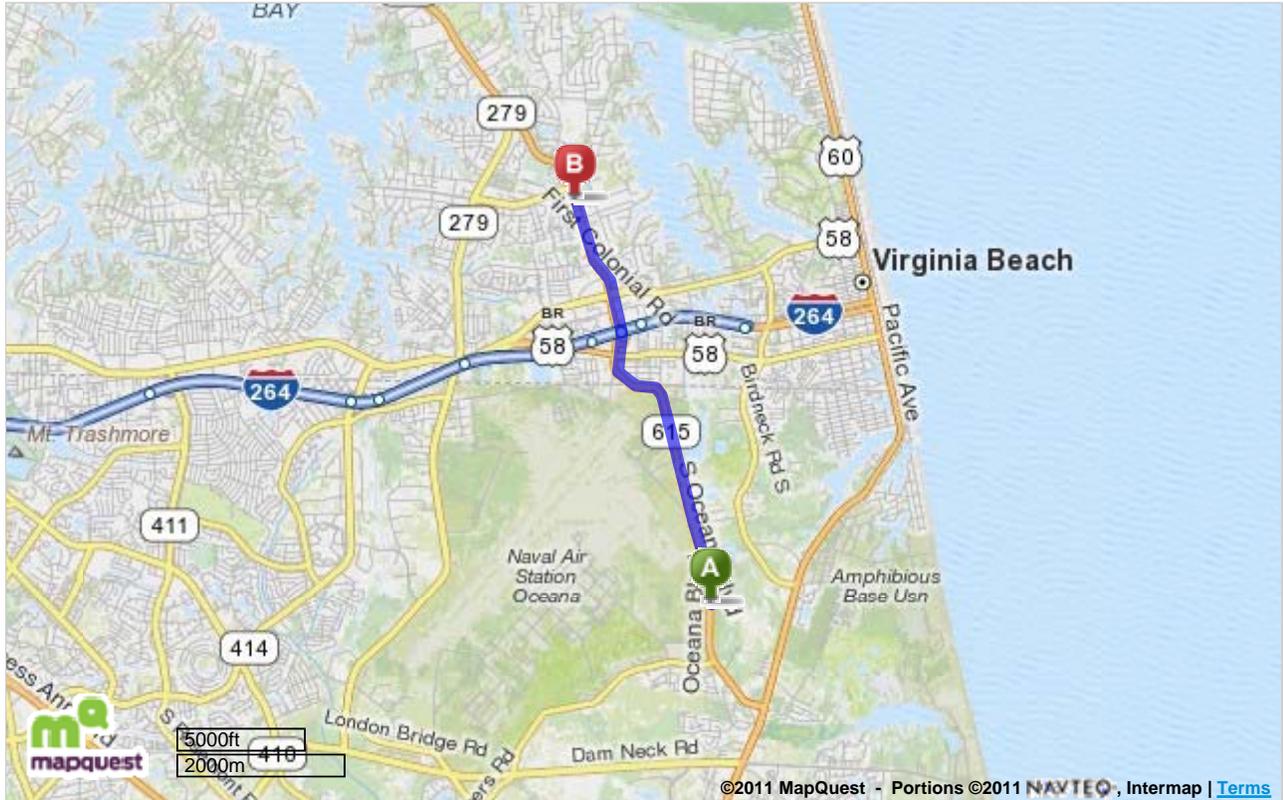
Trip to:
 1060 First Colonial Rd
 Virginia Beach, VA 23454-3002
4.32 miles
7 minutes

Notes

Figure 3 Sentara Virginia Beach General Hospital (EMERGENCY Facility) - Route Map

	1040 Oceana Blvd Virginia Beach, VA 23454-4980	Miles Per Section
	1. Start out going north on Oceana Blvd / S Oceana Blvd / VA-615 N toward Bells Rd . Continue to follow Oceana Blvd / VA-615 N .	Go 2.6 Mi
	2. Oceana Blvd / VA-615 N becomes First Colonial Rd .	Go 1.7 Mi
	3. 1060 FIRST COLONIAL RD. <i>Your destination is just past Colonial Medical Ct</i> <i>If you reach First General Pky you've gone a little too far</i>	
	1060 First Colonial Rd Virginia Beach, VA 23454-3002	4.3 mi

Total Travel Estimate: **4.32 miles - about 7 minutes**



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Trip to:
 1290 Diamond Springs Rd
 Virginia Beach, VA 23455-3701
15.20 miles
21 minutes

Notes

Figure 4 I&O Medical Center Occupational Health Clinic (Non-Emergency Facility) - Route Map

	1040 Oceana Blvd Virginia Beach, VA 23454-4980	Miles Per Section	
	1. Start out going north on Oceana Blvd / S Oceana Blvd / VA-615 N toward Bells Rd . Continue to follow Oceana Blvd / VA-615 N .	Go 2.6 Mi	
	2. Oceana Blvd / VA-615 N becomes First Colonial Rd .	Go 0.4 Mi	
		3. Merge onto I-264 W / Norfolk-Virginia Beach Expy via the ramp on the left toward Norfolk . <i>If you reach Donna Dr you've gone about 0.1 miles too far</i>	Go 8.7 Mi
	4. Take the Newton Rd exit toward I-64 W / Richmond / US-13 / Military Hwy .	Go 0.4 Mi	
	5. Take the Newtown Rd exit.	Go 0.3 Mi	
	6. Turn right onto Newtown Rd / N Newtown Rd / VA-403 . Continue to follow Newtown Rd . <i>If you are on Stoney Pt S and reach Cornwallis Ln you've gone a little too far</i>	Go 1.3 Mi	
	7. Stay straight to go onto Diamond Springs Rd .	Go 1.5 Mi	
	8. 1290 DIAMOND SPRINGS RD is on the right . <i>Your destination is just past Shell Rd</i> <i>If you are on Diamond Springs Rd and reach Ward Ave you've gone about 0.4 miles too far</i>		
	1290 Diamond Springs Rd Virginia Beach, VA 23455-3701	15.2 mi	

Attachment A

Site Safety and Health Plan

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**DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND, MID-ATLANTIC
REMEDIAL ACTION OPERATIONS (RAO)/LONG TERM MANAGEMENT (LTM),
ENVIRONMENTAL MULTIPLE AWARD CONTRACT (EMAC)
CONTRACT NO. N40085-11-D-0043
TASK ORDER NO. 0001**

**FINAL
SITE SAFETY AND HEALTH PLAN
FOR
OCEANA SALVAGE YARD ACCESS ROAD
NON-TIME-CRITICAL REMOVAL ACTION
AT
NAVAL AIR STATION OCEANA
VIRGINIA BEACH, VIRGINIA**

Issued:

March 26, 2012

Prepared for:

Department of the Navy
Naval Facilities Engineering Command, Mid-Atlantic
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**Revision:
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**Date:
March 26, 2012**

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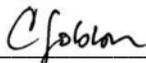
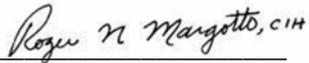
**Approved by:
R. Margotto, CIH, CSP**

**Pages Affected:
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APPROVALS

By their signature, the undersigned hereby certify that this Site Safety and Health Plan (SSHP) has been reviewed and approved for use during the Oceana Salvage Yard Access Road Non-Time-Critical Removal Action at the Naval Air Station Oceana facility located in Virginia Beach, Virginia.

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	_____ Peter McCormick PLAN APPROVAL	DATE
PROJECT MANAGER		
Signature		<u>3/20/12</u>
	_____ John Dormi PLAN APPROVAL	DATE
PLAN PREPARER		
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Signature		<u>3/20/12</u>
	_____ Roger Margotto, CIH, CSP PLAN APPROVER	DATE
SITE SAFETY AND HEALTH OFFICER		
Signature		<u>3/20/12</u>
	_____ Jerrett Patterson	DATE

SES-TECH AND THE NAVAL FACILITIES ENGINEERING COMMAND, MID-ATLANTIC (NAVFAC MIDLANT) DO NOT GUARANTEE THE HEALTH OR SAFETY OF ANY PERSON ENTERING THIS SITE. DUE TO THE NATURE OF THIS SITE AND THE ACTIVITY OCCURRING THEREON, IT IS NOT POSSIBLE TO DISCOVER, EVALUATE, AND PROVIDE PROTECTION FOR ALL POSSIBLE HAZARDS THAT MAY BE ENCOUNTERED. STRICT ADHERENCE TO THE HEALTH AND SAFETY GUIDELINES SET FORTH HEREIN WILL REDUCE, BUT NOT ELIMINATE, THE POTENTIAL FOR INJURY AT THIS SITE. THE HEALTH AND SAFETY GUIDELINES IN THIS PLAN WERE PREPARED SPECIFICALLY FOR THIS SITE AND SHOULD NOT BE USED ON ANY OTHER SITE WITHOUT PRIOR RESEARCH AND EVALUATION BY TRAINED HEALTH AND SAFETY SPECIALISTS.

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ABBREVIATIONS AND ACRONYMS

AHA	Activity Hazard Analysis
ANSI	American National Standards Institute
APP	Accident Prevention Plan
APR	Air Purifying Respirator
bgs	Below ground surface
BP	Boiling Point
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CFR	Code of Federal Regulations
CMC	Corporate Medical Consultant
CNS	Central Nervous System
CPR	Cardiopulmonary Resuscitation
CRL	Corporate Reference Library
CRZ	Contamination Reduction Zone
CSP	Certified Safety Professional
CSQ®	Client Service Quality®
DEET	N, N-Diethyl-meta-toluamide
EHS	Environmental, Health and Safety
EMAC	Environmental Multiple Award Contract
EMS	Emergency Medical Services
ESQ	Environmental, Safety and Quality
ESS	Environmental and Safety Supervisor
EZ	Exclusion Zone
FCR	Field Change Request
FEAD	Facilities Engineering and Acquisition Division
FP	Flash Point
GFCI	Ground Fault Circuit Interrupter
GI	Gastrointestinal
HAZWOPER	hour Hazardous Waste Operations and Emergency Response
HSG	Health and Safety Guidelines
LEL	Lower Explosive Limit
LOP	Level of Protection
Mg/kg	milligrams per kilogram
MIDLANT	Mid-Atlantic
MSDS	Material Safety Data Sheets
MW	Molecular Weight
N/A	Not Applicable
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
NTCRA	Non-Time Critical Removal Action
OSHA	Occupational Safety and Health Administration
PCBs	polychlorinated biphenyls
PEL	Permissible Exposure Limit
PESM	Project Environmental Safety Manager
PM	Project Manager
ppm	parts per million
PPE	Personal Protective Equipment

RAO	Remedial Action Operation
RCRA	Resource Conservation and Recovery Act
RPM	Remedial Project Manager
SES	Sealaska Environmental Services, LLC
SES-TECH	SES-TECH Atlantic
SSHO	Site Safety and Health Officer
SSHP	Site Health and Safety Plan
SVOC	Semi-volatile Organic Compound
SZ	Support Zone
TCLP	Toxicity Characteristic Leaching Procedure
TtEC	Tetra Tech EC, Inc.
UEL	Upper Exposure Limit
UL	Underwriter's Laboratories
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
VDEQ	Virginia Department of Environmental Quality
VOC	Volatile Organic Compound
VP	Vapor Pressure
ZIP [®]	Zero Incident Performance [®]
ZPP	zinc protoporphyrin

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1.0 INTRODUCTION

1.1 Purpose

The planned non-time-critical removal action (NTCRA) will be performed by SES-TECH Atlantic (SES-TECH), a joint venture between Sealaska Environmental Services, LLC (SES) and Tetra Tech EC, Inc. (TtEC) under the Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic (MIDLANT) Remedial Action Operation (RAO) Long Term Management Environmental Multiple Award Contract (EMAC).

This Site Safety and Health Plan (SSHP) addresses the appropriate practices that will be employed by workers participating in activities during the Oceana Salvage Yard Access Road NTCRA at Naval Air Station (NAS) Oceana located in Virginia Beach, Virginia. SES uses the TtEC corporate Environmental Health and Safety (EHS) Programs and procedures. This SSHP presents procedures to be followed by SES-TECH, its subcontractors, site visitors, and all other on-site personnel to avoid and, if necessary, protect against health and/or safety hazards. Activities performed under this SSHP will comply with Occupational Safety and Health Administration (OSHA) Regulations, 29 Code of Federal Regulations (CFR) Parts 1910 and 1926, United States Army Corps of Engineers (USACE) Engineer Manual (EM) 385-1-1, and the SES-TECH corporate EHS Program. A control copy of the SES-TECH EHS program is available on-line as part of the SES-TECH Corporate Reference Library (CRL). This library is accessible to SES-TECH employees via an internet connection.

This SSHP is prepared under the direction of a Certified Industrial Hygienist (CIH) (i.e., the Project Environmental Safety Manager [PESM]). Modifications to this SSHP may be made with the approval of the PESM using the Field Change Request (FCR) form found in Appendix A.

1.2 Project Background

NAS Oceana (Figure 1) has been in existence since 1940 when it was established as a small auxiliary airfield. NAS Oceana is now a 6,000-acre master jet base. The primary mission of NAS Oceana is to provide the personnel, operations, maintenance, and training facilities to ensure that fighter and attack squadrons on aircraft carriers of the U.S. Atlantic Fleet are ready for deployment.

The project site is not within the gated portion of the station, but is owned by the Navy. The Oceana Salvage Yard Access Road is located within the buffer zone of NAS Oceana, to the east of Oceana Boulevard. The access road to the Oceana Salvage Yard is on Navy property; Oceana Salvage Yard maintains an easement to continue access. Historical site information indicates that a large volume of crushed car battery casings were brought to the salvage yard in the 1960s and were used as fill material for the base of the access road.

1.3 Scope

This SSHP has been developed to address the identified health and safety concerns associated with activities at the site.

1.3.1 Project Description and Project Objectives

The overall objective of the Oceana Salvage Yard Access Road project is the removal of lead-contaminated soil from previously defined areas (grids) along both shoulders of the access road, which runs along Navy property to the property line of the Oceana Salvage Yard.

Field mobilization activities will include installing erosion and sediment controls, performing a geophysical survey for underground utility locations, and performing a grid layout survey to establish the cells designated for hazardous and nonhazardous soil removal. Clearing and grubbing will be performed prior to excavation. Excavation to a depth of 2 feet will begin with grids designated for hazardous soil starting at the eastern end of the project area and moving westward.

After hazardous soil excavation is complete, grids designated for nonhazardous soil will be excavated starting at the east and working westward. Prior to backfilling, three-point composite confirmatory samples will be collected from each of the excavated grids as well as the north and south staging areas. Eighteen inches of certified clean backfill soil will be placed on top of an orange fabric barrier installed at the bottom of each excavation. The remaining 6 inches will be backfilled with stone or topsoil, depending on the area. After backfill is complete, the existing access road will be capped using a 5-inch asphalt base course over a 6-inch aggregate base course. Restoration will consist of seeding disturbed areas. Finally, demobilization activities such as equipment decontamination and removal of supplies and equipment from the site will be performed.

1.3.2 Scheduled Tasks

The following major activities will be performed on-site during implementation of the removal action:

- Mobilization (including site preparation and installation of soil erosion controls)
- Geophysical and Geographical Surveys
- Clearing and Grubbing (including chain saw and chipper utilization)
- In-situ Chemical Stabilization Treatment, Soil Excavation and Soil Management (including truck loading and waste management)
- Confirmatory Soil Sampling and Barrier Fabric Placement
- Backfill of Excavation and Regrading
- Gravel Placement and Asphalt Cap Installation
- Restoration (including grass seeding)
- Demobilization (including equipment decontamination)

1.4 Application

This SSHP applies to all personnel involved in the scheduled tasks who wish to gain access to active work areas, including but not limited to SES-TECH employees and subcontractors, and client representatives.

The NAVFAC MIDLANT and its designated governmental management agencies are responsible for ensuring that all personnel and third party monitors comply with OSHA and USACE EM 385-1-1 applicable requirements.

SES-TECH subcontractors will develop Activity Hazard Analyses (AHAs) specific to their scope of work, which will be reviewed and approved by SES-TECH prior to the start of work.

1.4.1 Tasks

The following major activities will be performed during the on-site implementation of the removal action.

1.4.1.1 Mobilization (AHA #1)

Activities will include delivery of personnel, equipment, and materials as well as site preparation activities necessary to perform the work. Site preparation will include the placement of traffic control devices, installation of erosion and sediment control measures, and construction of decontamination pads and work zone preparation. A waste storage area will be established to stage 55-gallon steel drums (per Waste Management Plan).

1.4.1.2 Geophysical and Geographical Surveys (AHA #2)

The layout survey will include staking excavation grids and other existing site conditions.

A sub-surface geophysical utility survey will be conducted in addition to contacting the One-Call service to confirm underground utility clearance prior to any intrusive activities. Any existing underground utilities in the vicinity of excavation areas will be marked with appropriate utility color codes.

1.4.1.3 Clearing and Grubbing (AHA #3)

An excavator will be used for most of the clearing and grubbing activities. Any large trees will be cut down using a chainsaw. Cleared vegetation will be chipped and spread on-site for erosion control.

Removed root balls are assumed to be lead-contaminated and will be loaded for off-site disposal along with the excavated lead-contaminated soil.

1.4.1.4 In-situ Chemical Stabilization Treatment, Soil Excavation and Soil Management (AHA #4)

Prior to excavation, soil will be treated to chemically stabilize the lead contamination in-situ. The treatment material, Ecobond® Pb, will be spread upon the soil by hand or with a mechanical spreader and mixed into the soil with the excavator bucket.

Post-treatment soil sampling will be conducted (see Task 1.4.1.6) after the Ecobond® Pb material has been applied and mixed into the soil.

After treatment is complete and confirmed by post-treatment sample analysis, soil will be excavated from 18 designated grids and the north and south staging areas and direct loaded into lined trucks for off-site disposal. Other waste management activities such as containerization of site waste materials into drums (e.g., personal protective equipment [PPE]) will occur during the excavation work as well as during other tasks.

After excavation is complete, confirmatory sampling will be conducted (see Task 1.4.1.6).

Shoulder Area

Soils in the grid cells designated as hazardous will be excavated initially. This initial excavation will be followed by the excavation of nonhazardous grid cells. The excavation depth will be 2 feet below ground surface (bgs) within the boundaries of the predetermined grid cell. Excavated soils will be directly loaded into appropriate trucks by the excavator.

North and South Staging Areas

Excavation of lead-impacted soil in the staging area will be performed from predetermined grids from both the north and south sides of the access road.

The soil in these grids is characterized as nonhazardous. Excavation depth is 2 feet bgs within the boundaries of the predetermined grid cell. Excavated soils will be directly loaded into appropriate trucks.

1.4.1.5 Post-Treatment Soil Sampling, Confirmatory Soil Sampling and Barrier Fabric Placement (AHA #5)

After soil treatment, post-treatment sampling and analysis will be conducted to confirm that the concentrations of lead in the soil do not exceed the Resource Conservation and Recovery Act (RCRA) lead limit. Post-treatment samples consist of grab samples collected from multiple grids that are subsequently composited for sample analysis for TCLP lead.

After soil excavation, confirmatory samples (each sample will be a 3-point composite) will be collected from the bottom of each excavated grid cell and from the north and south staging areas. Samples will be sent to an approved laboratory for target analyte list lead analysis. At the completion of sampling, a protective fabric barrier with a high-visibility warning indicator will be installed at the bottom of each excavated grid cell prior to backfilling.

1.4.1.6 Backfill of Excavation and Regrading (AHA #6)

To avoid hazards associated with open, contaminated excavations, backfilling will be performed as soon as the barrier fabric is in place, before sampling results are received. Certified clean backfill will be placed and compacted using an excavator bucket and will be track-compacted with a dozer. Topsoil will be spread into place with a dozer.

1.4.1.7 Gravel Placement and Asphalt Cap Installation (AHA #7)

An aggregate base will be installed in the designated asphalt pavement areas. Asphalt will be installed over the base aggregate. After installation of an asphalt cap, appropriate stone material will be placed along the road shoulders using an excavator and/or backhoe.

1.4.1.8 Restoration (AHA #8)

Wetlands restoration consisting of seed placement, via hydro-seeding, will be completed per the Work Plan for Oceana Salvage Yard Access Road NTCRA specifications.

1.4.1.9 Demobilization (AHA #9)

Demobilization will include removal of traffic control devices, equipment and supplies, accumulated trash, and any other miscellaneous tools or temporary facilities (such as the decontamination pad). Final waste disposition will occur during demobilization.

Equipment and tools that made contact with site soils during site activities will be decontaminated via dry brushing prior to leaving the site. A misting hose or sprayer will be used to prevent dust emissions.

1.5 Summary of Major Risks

During site work, the major risks to workers are:

- Being struck by automobiles and/or trucks
- Exposure to the site chemical of concern (primarily lead)

- Contact by power tools/heavy equipment
- Slips/trips/falls

1.6 Zero Incident Performance®

Zero Incident Performance (ZIP) describes SES-TECH's approach and expectations for both safety and project execution. SES-TECH will achieve this level of performance excellence through teamwork and partnering with its client and subcontractors, and through the participation of every person on this project.

SES-TECH and the client believe that:

All incidents are preventable through proper planning, tasking, and execution of plans as written. Any goal besides Zero Incident Performance® is unacceptable and sends the message that incidents cannot be prevented.

In addition, an incident includes an event that could have resulted in one of these outcomes had the circumstances been different ("near miss").

Each person on this project is individually responsible and accountable for his/her own safety performance. Active participation by all personnel is required in order to achieve ZIP. This includes SES-TECH personnel and subcontractor personnel. If any incident does occur, it must be reported and investigated to identify root causes, take corrective actions, and communicate the lessons learned.

Subcontractors, after contract award, shall be required to attend a health and safety orientation. This meeting will involve the subcontractor's key personnel, and will cover ZIP expectations.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

This section specifies the SES-TECH project organization.

SES-TECH NAVFAC EMAC contract – Program Manager is Peter McCormick.

Personnel involved in the project include:

- Project Manager (PM) – John Dormi
- Project Environmental Safety Manager (PESM) – Roger Margotto
- Site Superintendent/Site Safety and Health Officer (SSHO) – Jerrett Patterson
- Alternate SSHO – Stavros Patselas
- Site Personnel – SES-TECH employees
- Site Personnel – SES-TECH subcontractor employees

Names and positions for key project personnel are defined below.

2.1 Project Manager

The PM for the Oceana Salvage Yard Access Road project is Mr. John Dormi, who will:

- Have overall project responsibility for project environmental, health and safety.

- Ensure implementation of this program through coordination with the responsible PESM.
- Ensure that fieldwork is scheduled with adequate personnel and equipment resources to complete the job safely.
- Ensure that field site personnel are adequately trained and qualified to work at the site.
- Investigate and approve incident/accident reports.
- Ensure the SSHP has all the required approvals before site work is conducted.
- Ensure that the PESM or SSHO is informed of project changes that will require modifications to the SSHP.
- Ensure that inspections are conducted.
- Ensure the site competent person requirements are met.

The PM for the Oceana Salvage Yard Access Road project is:

Mr. John Dormi
Sealaska Environmental Services, LLC
Twin Oaks 1
5700 Lake Wright Drive, Suite 309
Norfolk, VA 23502
Cell: (757) 685-9566
john.dormi@sealaska.com

2.2 Project Environmental Safety Manager

The PESM is a senior Environmental Safety and Quality (ESQ) staff member with experience in hazardous waste site remediation activities. The SES-TECH PESM for the Oceana Salvage Yard Access Road project is Mr. Roger Margotto, CIH, CSP. Mr. Margotto's responsibilities include the following:

- Provide for the development and approval of the SSHP.
- Serve as the primary contact to review health and safety matters that may arise.
- Approve revised or new safety protocols for field operations.
- Approve individuals who are assigned SSHO responsibilities.
- Approve SSHO to fulfill other project roles.
- Coordinate revisions of this SSHP with field personnel.
- Coordinate upgrading or downgrading of PPE with the SSHO.
- Assist in the investigation of all accidents.
- Conduct inspections for compliance with the SSHP.

The PESM for the Oceana Salvage Yard Access Road project is:

Mr. Roger Margotto, CIH, CSP
Tetra Tech EC, Inc.
1230 Columbia St., Suite 750
San Diego, CA 92101-8536
Office: (619) 471-3503
Cell: (619) 988-0520
roger.margotto@tetrattech.com

2.3 Site Safety and Health Officer

The SSHO will be present during the conduct of site operations and possesses the knowledge and experience necessary to implement all elements of the approved plans. The designated SSHO for the Oceana Salvage Yard Access Road project is Jerrett Patterson.

The SSHO qualifications for this project include a minimum 5 years of experience and the successful completion of the SES-TECH Environmental Safety Supervisor (ESS) course. This course includes completion of 30 hours of web-based training in Construction Safety and 16 hours of instructor-led training by senior EHS staff. The SSHO requirements also include the completion of 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training and annual 8-hour HAZWOPER refresher training.

The SSHO responsibilities include the following:

- Executes the means for control of subcontractors as described in Section 4.2 of the Accident Prevention Plan.
- Ensures that site personnel provide adequate and applicable training documents certifying an individual's qualification to work at the site.
- Ensures that all health and safety activities identified in this SSHP are conducted and are in compliance with this plan.
- Conducts pretask safety and health analysis.
- Conducts and documents safety briefings and site orientations (when necessary).
- Ensures that monitoring instruments are calibrated and maintains health and safety field logbooks.
- Performs air monitoring in compliance with the requirements of this SSHP.
- Directs and coordinates health and safety monitoring activities, and ensures that proper PPE is used by field teams.
- Upgrades or downgrades of PPE based on site conditions and/or real-time monitoring results.
- Identifies operational changes that will require modifications to health and safety procedures and this SSHP; ensures that any procedure modifications are approved by the PESM and documented.
- Conducts weekly and monthly inspections and provides summaries of field operations and progress to the PESM.
- Performs emergency coordinator duties and ensures that adequate emergency response preparation and procedures, as well as emergency response equipment, are maintained.

- Notifies the PESM of applicable accidents/incidents and coordinates with the PM in conducting investigations.
- Ensures that personnel have the necessary training and fit testing for the use of each type of respirator and ensures that proper documentation is available.
- Ensures that PPE is maintained and inspected in accordance with the EHS plans and program requirements.
- Evaluates the effectiveness of the respiratory protection program on the site.
- Recommends changes to the types of PPE being used, as necessary.

As necessary and as deemed appropriate by the PESM, on long-term projects, the SSHO is responsible for maintaining displays and postings such as:

- Emergency telephone numbers
- OSHA Job Safety and Health Poster
- OSHA Noise Regulation
- Department of Labor Postings (minimum wage, fair labor standards)
- Hazard Warning Signs
- Noise Hazard Warning Sign
- Do It Right[®] Poster
- Client Service Quality[®] (CSQ[®]) Poster
- SES-TECH Shared Vision[®]
- SES-TECH Mission Statement
- SES-TECH Hot Line Poster
- SES-TECH Work Rules
- SES-TECH ESQ Policy Poster
- Zero Incident Performance (ZIP) Bulletins
- Diagrams showing the location of fire extinguishers and emergency equipment
- Emergency exit, evacuation routes and staging area (rally point)

The SSHO for the Oceana Salvage Yard Access Road project is:

Jerrett Patterson
1050 NE Hostmark St, Ste. 202
Poulsbo, WA 98370
Cell: (360) 434-5449
Jerrett.patterson@tetrattech.com

2.4 Alternate Site Safety and Health Officer

The alternate SSHO is Stavros Patselas. The alternate SSHO will be present on-site during the conduct of field operations when the SSHO is not on-site and is responsible for all health and safety activities. The alternate SSHO possesses the knowledge and experience necessary to ensure that all elements of the approved SSHP are implemented and enforced on-site. The alternate SSHO will be present during the conduct of plant operations and possesses the knowledge and experience necessary to implement all elements of the approved plans.

Alternate SSHO qualifications for this project include the successful completion of the SES-TECH ESS course. This course includes completion of 30 hours of web-based training in Construction Safety and 16 hours of instructor-led training by senior EHS staff. The alternate SSHO requirements also include the completion of 40-hour HAZWOPER training and annual 8-hour HAZWOPER refresher training.

The alternate SSHO will implement the APP and the SSHP in the field. The alternate SSHO's authority and responsibilities are the same as those of the SSHO.

The alternate SSHO for the Oceana Salvage Yard Access Road project is:

Stavros Patselas
Tetra Tech EC, Inc.
820 Town Center Dr., Ste 100
Langhorne PA 19047
Cell: (267) 688-9967
Stavros.patselas@tetrattech.com

2.5 Personnel/Work Parties

Responsibilities of site personnel/work parties include the following:

- Report any unsafe or potentially hazardous conditions to the SSHO.
- Maintain knowledge of the information, instructions, and emergency response actions contained in this SSHP.
- Comply with the rules, regulations, and procedures as set forth in this SSHP and any revisions.
- Prevent admittance to work sites by unauthorized personnel.
- Inspect all tools and equipment, including PPE, daily prior to use.
- Act as safety leaders.
- Implement the ZIP procedure.

3.0 SITE HISTORY AND PROJECT DESCRIPTION

3.1 Location

NAS Oceana, located in Virginia Beach, VA, has been in existence since 1940 when it was established as a small auxiliary airfield. NAS Oceana is now a 6,000-acre master jet base. The primary mission of NAS Oceana is to provide the personnel, operations, maintenance, and training facilities to ensure that fighter and attack squadrons on aircraft carriers of the U.S. Atlantic Fleet are ready for deployment.

The project site is not within the gated portion of the station, but is owned by the Navy. The Oceana Salvage Yard Access Road is located within the buffer zone of NAS Oceana, to the east of Oceana Boulevard (see Figure 1). The access road to the Oceana Salvage Yard is located on Navy property, and Oceana Salvage maintains an easement to continue access.

3.2 Background and Site Description

Historical site information indicated that a large volume of crushed car battery casings were brought to the salvage yard in the 1960s and were used as fill material for the base of the access road.

The Oceana Salvage Yard Access Road was first investigated as part of an environmental survey of the entire salvage yard in 1997. During this investigation, several soil samples within the Oceana Salvage Yard Access Road were collected and sent for laboratory analysis. The chemicals analyzed included volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and inorganics. Lead was detected in soil from waste piles at concentrations up to 86,500 milligrams per kilogram (mg/kg).

In January 2005, the Navy completed a direct-push investigation to verify whether the access road was actually constructed on crushed car batteries. Direct-push samples were collected from 25 locations along the roadway to a depth of 4 feet bgs. Waste containing battery casings was encountered at all but one sampling location. Battery fragments were encountered between approximately 0.1 and 3 feet bgs. The average depth to the bottom of the batteries was approximately 2.5 feet with batteries extending to 3.0 feet bgs at two locations.

In 2007, the United States Environmental Protection Agency (USEPA) drafted a Draft Administrative Settlement and Order on Consent for Removal Response Action (Settlement Agreement) to implement actions to prevent exposure to contaminants potentially posing unacceptable risk to human health related to the lead contamination in soil, defined as soils with levels of lead exceeding 800 mg/kg. The impacted soil is beneath the Oceana Salvage Yard Access Road (including the improved staging areas at the east end of the access road) and the access road shoulders.

In 2010, CH2M HILL was contracted by NAVFAC Mid-Atlantic to conduct soil sampling to determine the lead concentrations along the shoulders of the Oceana Salvage Yard Access Road. The CH2M HILL sampling effort was completed to support the USEPA Settlement Agreement, which includes the access road and road shoulder areas. Specifically, the purpose of the sampling was to delineate the physical extent of lead contamination along the shoulders of the access road, which was defined in the Settlement Agreement as strips of land extending 10 feet from the edges of either side of the access road to a maximum depth of 2 feet bgs. This delineation included the shoulders of the automobile traffic portion of the access road that begins at Oceana Boulevard, continues along the easement over the Navy property, and extends up to the service building on the Oceana Salvage Yard property.

The Navy delineated areas of lead contamination, as defined in the EPA's Settlement Agreement, by establishing a sampling plan which included a grid system along the Oceana Salvage Yard Access Road. In order to properly delineate the shoulders of the access road, a total of 35 grids were established along both sides of the access road/staging areas. Each grid extended 10 feet from the edge of the access road/staging area and had a length of approximately 50 feet along the road/staging area.

Of the 35 grids delineated and sampled in 2010, 18 grids were determined by the Navy to exceed the EPA Settlement Agreement action level of 800 mg/kg. Concentrations of lead detected in the samples ranged from 18.1 mg/kg to 149,000 mg/kg. Lead concentrations detected were found above the residential soil screening level of 400 mg/kg from USEPA's Regional Screening Level Table (USEPA, 2010) and

therefore were determined to potentially pose unacceptable risks to human receptors (Oceana Salvage Yard Access Road Confirmation Sampling, Naval Air Station Oceana, Virginia Beach, Virginia, 2010.)

Even though the 2007 Draft Consent Order was not finalized, the Navy reached agreement with the USEPA and Virginia Department of Environmental Quality (VDEQ) to remediate the access road and shoulders in accordance with the draft Settlement Order.

4.0 POTENTIAL HAZARDS OF THE SITE

This section presents an assessment of the chemical, biological, and physical hazards that may be encountered during the on-site activities. Additional information pertaining to potential hazards can be found in the AHAs (Appendix B of this SSHP).

4.1 Properties of Chemical Contamination

Based on soil sampling results from previous investigations, the soil is contaminated with inorganic lead. Use of a chemical stabilizer, Ecobond® Pb may also pose some health and safety risks. PPE is addressed in Table 6.1. Use of Ecobond® Pb and risk mitigation protocols is addressed in AHA #4. Refer to Table 4-1 for physical, chemical, and health hazard information. Additional information on Ecobond® Pb is found in the SSHP.

Concentrations of lead in soil samples from the Oceana Salvage Yard Access Road ranged from 18.1 to 149,000 mg/kg. Lead concentrations in dust could possibly exceed the OSHA Permissible Exposure Limit of 50 $\mu\text{g}/\text{m}^3$. Therefore this plan has requirements for compliance with the OSHA construction industry standard 29 CFR 1926.62. As will be noted in this plan, compliance requires monitoring, medical surveillance, PPE, methods to control dust, and training.

Table 4-1 Chemical Data

Compound	CAS #	OSHA PEL	Route Of Exposure	Symptoms Of Exposure	Target Organs	Physical Data
Lead	7439-92-1	0.050 mg/m ³	Inhalation Ingestion Skin contact	Weakness Insomnia Pallor Abdomen pain Tremor Anemia Hypotension	GI Tract CNS Kidneys Blood Gingival tissue	MW: 207.2 BP: 3,164° F FP: N/A VP: 0 LEL: N/A UEL: N/A Sol: Insol
Ecobond® Pb (Inorganic Salt)	N/A	OSHA TWA over an 8 hour period: 15 mg/m ³ ACGIH TWA over an 8 hr period: 10	Eye and skin contact Inhalation Ingestion	May burn or irritate eyes and skin	Eyes Skin	MW: Not available BP: decomposes MP: 288 ° F FP: N/A VP: N/A Sol: Soluble in water

Abbreviations and Acronyms:

BP = Boiling Point
 CNS = Central Nervous System
 FP = Flash Point
 GI = Gastrointestinal
 Insol = Insoluble
 LEL = Lower Explosive Limit
 mg/m³ = milligrams per cubic meter
 MP = Melting Point
 MW = Molecular Weight
 N/A = Not Applicable
 PEL = Permissible Exposure Limit
 Sol = Solubility
 TWA: Time weighted average
 UEL = Upper Explosive Limit
 VP = Vapor Pressure (at approximately 68 °F in mm Hg)

Results of the chemical analyses for additional compounds did not report any additional contaminants in significant or elevated concentrations that would warrant remediation and do not pose a chemical hazard to site personnel.

4.2 Biological Hazards

During the course of the project, there is a potential for workers to encounter biological hazards such as animals, insects, and plants.

4.2.1 Animals

During site operations, animals such as dogs, cats, raccoons, skunks, mice, and snakes may be encountered. Workers will use discretion and avoid all contact with animals.

4.2.2 Insects

Insects, such as mosquitoes, ticks, bees, and wasps may be present during certain times of the year. Workers will be encouraged to wear repellents (e.g., DEET for ticks) when working in areas where insects are expected to be present.

4.2.2.1 Lyme Disease

Lyme disease is caused by an infection from a deer tick that is about the size of the head of a pin. After a blood feeding, the tick becomes engorged and may vomit its stomach contents into the host, a microorganism (spirochete) may be transmitted into the bloodstream. The feeding time is 24 to 48 hours. The effects of the disease vary from person to person, which often makes it difficult to diagnose. Typically, the incubation period ranges from 2 days to 2 weeks. In most cases, the infected area will resemble a red bull's eye with concentric rings. Within the same period, flu-like symptoms may develop. If left untreated, the red ringed area will eventually fade and Lyme disease may further develop into an arthritis-like condition.

The best method for stopping insect borne disease is to avoid the bite. Control measures to prevent Lyme Disease include the following:

- Avoid dense or high brush, when possible.
- Wear light-colored clothing.
- Wear light-colored Tyvek[®] or protective wear.
- Spray DEET on your skin and Permethrin on clothing and work boots.
- Tuck pant legs into socks and shirts into gloves, if possible.
- Perform a self/buddy check of neck, hairline, and body after working in areas that may contain deer ticks.
- Wear booties over work boots.
- Look for ticks upon returning from field work.
- Shower as soon as possible after performing fieldwork.

If a tick is found, remove it by pulling gently at the head with tweezers and save the tick for possible analysis for the spirochete. Report any of the above symptoms and all tick bites to the SSHO for evaluation. Employees bitten by deer ticks during the course of employment or one who finds an engorged tick on their body, will be given a medical examination. Analysis of the tick for spirochetes may be warranted. Administration of antibiotic therapy may be warranted. Either action may be taken with the concurrence of the Corporate Medical Consultant.

4.3 Physical Hazards

This section addresses physical hazards. Physical hazards are also discussed in the AHAs provided in Appendix B.

4.3.1 Heat Stress

There is a potential for heat stress and related injuries during work activities. Specific potential hazards include:

- Heat rash
- Fainting
- Heat cramps
- Heat syncope
- Heat exhaustion
- Heat stroke

Sweating does not cool the body unless the sweat evaporates. Heat rash occurs because sweat is not evaporating, causing irritation and vesicular inflammation. Standing erect and immobile in the heat allows blood to pool in the lower extremities. As a result, blood does not return to the heart to be pumped back to the brain and fainting may occur. Heat cramps are painful spasms of the muscles due to excessive water and salt loss from profuse sweating. Similarly, heat exhaustion occurs due to the large fluid and salt loss from profuse sweating. Heat exhaustion is characterized by clammy and moist skin, nausea, dizziness, headaches, and low blood pressure.

Heat stroke occurs when the body's temperature regulatory system has failed. Skin is hot, dry, red, and spotted. The affected person may be mentally confused, delirious, and convulsions may occur. A person exhibiting signs of heat stroke should be removed from the work area and moved to a shaded area immediately. The injured person should be soaked with water and fanned to promote evaporation. Medical attention must be obtained immediately.

IMPORTANT: EARLY RECOGNITION AND TREATMENT OF HEAT STROKE ARE THE ONLY MEANS OF PREVENTING BRAIN DAMAGE OR DEATH.

Early symptoms of heat stress related problems include the following:

- Decline in task performance
- Lack of coordination
- Decline in alertness
- Unsteady walk

- Excessive fatigue
- Muscle cramps
- Dizziness

Proper training and preventive measures will aid in averting loss of worker productivity and serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat-related illnesses.

To avoid heat stress, the following steps, as necessary, will be implemented at the site.

- Adjust work schedules:
 - Modify work/rest schedules according to monitoring requirements.
 - Mandate work slowdowns as needed.
- Perform work during cooler hours of the day, if possible, or at night if adequate lighting can be provided.
- Perform physiological monitoring. Refer to EHS 4-6, Temperature Extremes, Attachment C of the APP.
- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.
- Maintain worker's body fluids at normal levels. This is necessary to ensure the cardiovascular system functions adequately.

Daily fluid intake must approximately equal the amount of water lost in sweat, e.g., 8 fluid ounces (0.23 liters) of water must be ingested for approximately every 8 ounces (0.23 kilograms [kg]) of weight loss.

The normal thirst mechanism is not sensitive enough to ensure that sufficient water will be consumed to replace lost sweat. When heavy sweating occurs, encourage the worker to drink more.

The following strategies may be useful.

- Maintain water temperature at 50 to 60 degrees Fahrenheit (°F) (10 to 16.6 degrees Celsius [°C]).
- Provide small disposable cups that hold about 4 ounces (0.1 liter).
- Have workers drink 16 ounces (0.5 liters) of fluid, preferably water or dilute drinks, before beginning work.
- Urge workers to drink fluids every 15 to 20 minutes, or at each monitoring break.
- A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight.
- Train workers to recognize the symptoms of heat-related illnesses.
- Rotate personnel and alternate job functions.
- Utilize cooling vests when impermeable clothing is worn.

4.3.2 Cold Stress

In preventing cold stress, the SSHO must consider factors relating both to the worker and the environment. Training, medical screening, establishment of administrative controls, selecting proper work clothing, and wind-chill monitoring all contribute to the prevention of hypothermia and frostbite.

SES-TECH corporate procedure EHS 4-6 (Attachment C, APP) describes the Temperature Extremes Program.

The main elements of the SES-TECH Health and Safety Program related to temperature extremes consist of the following:

- PPE (e.g., hard hat liners, boot and glove liners, insulated coveralls)
- Engineering controls (e.g., heaters)
- Administrative controls (e.g., work/warm up schedule, acclimatization)
- Recognition of an injury related to cold stress (frostbite and hypothermia)
- Warm rest area
- Employee training

Some tasks may be performed in the fall and winter. Workers may be exposed to the hazards of working in cold environments. Potential hazards in cold environments include frostbite, trench foot (or immersion foot), and hypothermia.

Frostbite is both the general and medical term given to areas of cold injury. Unlike hypothermia, frostbite rarely occurs unless environmental temperatures are less than freezing and usually less than 20 °F. Frostbite injuries occur most commonly on the distal parts of the body (nose, earlobes, hands, and feet) that are subject to intense vasoconstriction.

The three general categories of frostbite are:

- **Frost Nip** – A whitened area of the skin which is slightly burning or painful.
- **Superficial Frostbite** – Waxy, white skin with a firm sensation but with some resiliency; symptomatically feels “warm” to the victim with a notable cessation of pain.
- **Deep Frostbite** – Tissue damage deeper than the skin; at times, down to the bone. The skin is cold, numb, and hard.

4.3.3 Noise

Noise is a potential hazard associated with the operation of heavy equipment and power tools. A general rule is to wear hearing protection if you cannot hear normal conversation within an arm’s length of the person talking. Hearing protection must be worn if noise levels are above the following decibel (dBA) ratings.

- 84 dBA – 8-hour time weighted average
- 100 dBA – 15 minute short-term exposure limit
- 140 dBA – instantaneous noise

4.3.4 Power Hand Tools

Workers must learn to recognize the hazards associated with the different types of tools and the safety precautions necessary to prevent injuries from those hazards. To prevent accidents resulting from the use of hand and power-operated tools, the following safe work practices will be implemented and enforced.

Broken, defective, burned, or mushroomed tools will not be used. All such tools will be reported and turned in for replacement. The proper tool and equipment will be selected and used for each task. The practice of throwing tools from one location to another or from one employee to another, or dropping them to lower levels, will be prohibited. When it is necessary to pass tools or material under the above conditions, suitable containers and/or ropes must be used.

Electric tools – Electric tools present several dangers to the user; the most serious is the possibility of electrocution. The following safe work procedures for electric tools must be implemented and enforced. Tools must:

- Have a three-wire cord with ground and be grounded
- Be double-insulated
- Be powered by a low-voltage isolation transformer

Never remove the third (grounding) prong from the plug end. Electrical tools will not be used in damp or wet locations and will always be used within their design limitations. A ground fault circuit interrupter (GFCI) must be used or the tool must be double insulated to protect the worker from electrical shock hazards. However, gloves will not be worn when there are potential entanglement hazards with reciprocating or rotating tools.

4.3.5 Fires

Personnel will make every effort possible to reduce the amount of combustible materials present and eliminate fire sources. Fire prevention and protection measures require preplanning. At least one 10-pound dry chemical ABC fire extinguisher will be located in close proximity to the work area. Fire extinguishers inside the cab of pickup trucks will be 2 ½ -pound dry chemical ABC and must be mounted or secured. Employees will follow safe work practices to include proper storage of flammable and combustible liquids. Smoking is permitted only in those areas designated specifically by the SSHO.

All areas where flammable gases are stored shall be posted as FLAMMABLE, NO SMOKING. All other flammable liquids will be stored in an approved storage cabinet unless they are intended for immediate use.

No refueling will be performed unattended (latch-on fueling hoses are prohibited). No smoking is authorized in any areas where refueling is performed.

In the event of a fire or explosion, summon the Virginia Beach Fire Department immediately (by dialing 911), take a head count, and implement site evacuation procedures. Site personnel should initiate fire suppression with fire extinguishers if safe to do so, and the SSHO shall be notified. Any fire must be reported to the PM and the PESM after notifying emergency services.

The person reporting the fire is required to provide the following information:

- His/her name
- Location of the fire and facility number, if known
- Number of injured personnel and nature of injuries, if known
- Substance(s), chemical(s), or materials involved in the fire
- Size of the fire and available fuel (estimate)
- Extent of fire
- Rate that the fire is expanding (estimate)
- Time the fire started and the time the fire was extinguished
- Any other pertinent information

The client, in coordination with the PM, will manage notifications to regulatory agencies. In addition, any fire will be reported to the PESM.

4.3.6 Fuel

On-site fueling activities will be performed on this project. Only Underwriter's Laboratories (UL) approved metal cans shall be used at the project site. All fuel storage containers will be labeled properly. A properly rated fire extinguisher will be located adjacent to all refueling trucks and any on-site fuel storage facility. Material Safety Data Sheets (MSDSs) for on-site fuels will be made available to all site personnel. When refueling, personnel will place a drip pan or spill pads underneath the fill port to catch any spillage or overflow.

4.3.7 Slips, Trips, and Falls

Slips, trips, and falls are a leading cause of injuries in this work setting, therefore, a concerted effort to identify, control, and eliminate these hazards and the measures needed to reduce or eliminate the possibility of injury will be communicated to all site personnel.

4.3.8 Manual Lifting

Manual lifting may be required. Failure to follow the proper lifting technique can result in back injuries and strains. Back injuries are a serious concern as they are the most common workplace injury, often resulting in lost or restricted time and long periods of treatment and recovery. Basic lifting and material handling techniques will be reviewed with all personnel prior to the start-up of on-site activities. Controls may include engineering controls, reducing the weight of objects that are carried, reducing the distance of carrying, or reducing loss potential by rotating workers.

SES-TECH's corporate EHS policy states that individual employees are not to lift loads greater than 50 pounds. However, this limit may be lowered based on an individual's stature and level of fitness, as determined by the SSHO.

The following guidance should be followed to lift anything, particularly heavier loads, safely:

- Make sure the path of travel is clear.

- Size up the load as to its weight, size, and shape.
- Place the feet about a foot apart and close to the object for good balance.
- Bend the knees to a comfortable position and get a good handhold.
- Using both leg and back muscles, lift the load straight up, smoothly and evenly.
- Pushing with the legs, keep the load close to the body.
- Lift the object into carrying position, avoiding twisting movements until the lift is completed.
- Turn the body with changes of foot position. Do not twist at the waist when lifting.
- Using both leg and back muscles, comfortably lower the load by bending the knees.
- When the load is securely in place, release the grip.
- Setting down the load is just as important as picking it up.

The same steps apply to team lifting, with the emphasis on coordination. All should start and finish the lift action at the same time and perform turning movements together.

4.3.9 Traffic Control Activities

The work activities planned for this project may present physical hazards that are inherent to working near motor vehicles. This exposure risk occurs during routine operation of the adjacent Oceana Salvage Yard Access Road along the limits of excavation. The Site Traffic Control Plan is detailed in the Work Plan for Oceana Salvage Yard Access Road NTCRA.

When working in these areas follow this procedure:

- Wear high-visibility traffic vest.
- Use the designated parking area for site personnel vehicle parking.
- Set up traffic cones on either side of the work area to funnel traffic away from that area.

The Oceana Salvage Yard Access Road is the means of access to the Oceana Salvage Yard. This road is adjacent to the excavation grids where excavation and other activities will occur. This access road is to remain open and passable during all site activities. SES-TECH personnel will not perform flag person duties unless they have been trained and are directed to perform the function. Traffic control will include ceasing ongoing site tasks to allow salvage yard vehicles to utilize the access road to enter/exit the Oceana Salvage Yard.

4.3.10 Underground Utilities

Striking underground utilities is a possible hazard whenever intrusive activities are conducted. All steps will be taken to locate underground utilities as per Procedure EHS 3-15, Underground Utilities (see Attachment C of the APP). This includes white lining the area of intrusive activity and calling the “One-Call” (811) number to have underground utilities located and marked. On private property, a locating service and/or a geophysical survey will be conducted.

Underground utility avoidance requires that a “competent person” be designated. “Competent person” means one who is capable of identifying existing and predictable hazards in the surroundings or working

conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

The competent person will be responsible for:

- Obtaining a copy of, and understanding the applicable regulations for the state of Virginia
- Contacting the appropriate One-Call agency or private locating service, as applicable
- Recording One-Call locate numbers
- Renewing, if necessary, One-Call locate numbers before expiration
- Ensuring that white-lining of the area of intrusive work is performed
- Ensuring that a “positive response” has been received from every utility owner/operator identified by the One-Call agency and that they have located their underground utilities and appropriately marked any potential conflicts with the areas of planned intrusive activities
- Completion of the Underground Utilities Locating and Marking Checklist and the Underground Utilities Management Checklist
- Reviewing applicable AHAs with all project personnel before work begins
- Conducting training on communication protocols to be used by the intrusive activities observer and equipment operator
- Ensuring implementation of appropriate work practices during intrusive activities
- Conducting daily inspections of the intrusive activities area to make sure that all markings are intact
- Maintaining required records
- Providing the SSHO with all required documentation on a daily basis

4.3.11 Excavation and Trenching

Excavation will be conducted in accordance with the Excavation and Trenching Program, EHS 6-3 of the SES-TECH Corporate EHS Program, which is in Attachment C of the APP. Procedures in this document incorporate the requirements of 29 CFR 1926, Subpart P – Excavations. EHS 6-3 requires the designation of a competent person by the PM and requirements for safe excavating practices. The program also includes requirements for the monitoring of potentially hazardous atmospheres, protection from water hazards, analyzing and maintaining the stability of adjacent structures, daily inspections by the competent person, soil classification, sloping and benching, protective systems, and training.

SES-TECH technical personnel will assist the competent person perform his/her their duties.

Trenches 4 feet or greater in depth will require atmospheric monitoring and ladders for safe entry/egress. The competent person will determine the need for cave-in protection. If trenches exceed 5 feet in depth, cave-in protection will be implemented in accordance with the Excavation and Trenching Program, EHS 6-3. This project requires excavations of 2 feet in depth; therefore, there are no trenches as defined by the regulations.

The competent person(s) will be responsible for the following:

- Providing day-to-day oversight of open excavations and trenches
- Conducting soil classifications
- Selecting protective systems
- Conducting daily inspections of open excavations and trenches
- Providing the SSHO with all required documentation on a daily basis

The competent persons will have an adequate combination of experience and training to classify soil types and select protective systems as outlined in EHS 6-3. Training and experience pertaining to qualification as a competent person will be documented and include the following:

- General safety practices related to working in or near open excavations
- Inspection requirements and techniques
- Classification of soils in accordance with EHS 6-3
- Uses, limitations, and specifications of protective systems in accordance with EHS 6-3

Prior to any excavation or underground work, utilities will be identified and located following EHS 3-15 of the SES-TECH EHS Program.

During any activity which disturbs the soil, dust control measures such as the use of a fine spray of water to keep dust suppressed are required to minimize exposures of workers to lead contaminated dust. Ground workers will also be required to wear PPE to minimize their exposure to the lead contaminated soil. This is an engineering control method as required by 29 CFR 1926.62(e)(1).

5.0 ACTIVITY HAZARD ANALYSIS

Creation of AHAs is a systematic way of identifying the potential health and safety hazards associated with the major phases of work on the project and the methods to avoid, mitigate, and control these hazards. The AHAs will be developed for all activities as necessary, prior to start-ups.

The following AHAs have been developed for this project:

- AHA #1 – Mobilization (including site preparation and Installation of soil erosion controls)
- AHA # 2 – Geophysical and Geographical Surveys
- AHA #3 – Clearing and Grubbing (including chain saw and chipper utilization)
- AHA #4 – In-situ Chemical Stabilization Treatment, Soil Excavation and Soil Management (including truck loading and waste management)
- AHA #5 – Post-Treatment Soil Sampling, Confirmatory Soil Sampling and Barrier Fabric Placement
- AHA #6 – Backfill of Excavation and Regrading
- AHA #7 – Gravel Placement and Asphalt Cap Installation
- AHA #8 – Restoration (including grass seeding and planting)

- AHA #9 – Demobilization (including equipment decontamination)

6.0 PERSONAL PROTECTIVE EQUIPMENT

The PPE specified in Table 6-1 represents the initial level of PPE selection for each activity required by 29 CFR 1910.132. Specific information on the selection rationale for each activity can be found in the AHAs in Appendix B.

Additional tasks not included in Table 6-1 shall be reviewed by the SSHO and PESM. Any additional PPE requirements will be incorporated into the SSHP by completing the FCR form found in Appendix A. Modifications for initial PPE selection may also be made by the SSHO in consultation with the PESM using the same form. The PPE Selection form found in Appendix C may be used to list revised PPE requirements or PPE requirements for new tasks.

6.1 Upgrade Conditions

Level D PPE or modified Level D PPE is anticipated for site work, and with PESM approval, an upgrade to Level C PPE is possible. The SSHO is responsible for on-site inspections and evaluating work conditions and deciding the appropriate level of protection (LOP) required. Any change to site conditions that may impact the level of protection required or indicate a need for upgrading respiratory protection, shall be communicated by the SSHO to the PESM. The PESM shall determine the appropriate PPE and communicate this to the SSHO.

In the event the presence of dust indicates the need for respiratory protection, work operations will be suspended, Level C respiratory protection will then be implemented, and the PESM will be contacted.

Level B PPE is not anticipated or authorized for this site unless otherwise directed and approved by PESM.

6.2 Hazard Assessment for Selection of Personal Protective Equipment

The task-specific level of PPE required for each task is described in Table 6-1. The initial levels of protection were selected by performing a hazard assessment taking into consideration the following:

- Potential site physical hazards present or suspected
- Work operations to be performed
- Potential routes of exposure
- Characteristics, capabilities, and limitations of PPE
- Hazards that the PPE presents or magnifies

The primary routes of exposure for lead are skin contact, inhalation, and ingestion.

During various activities, there is a potential for skin contact and/or inhalation of lead-contaminated soil or dust. All ground workers are required to wear disposable coveralls, boot covers or PVC steel-toe boots, and disposable gloves (nitrile or latex).

Table 6-1 Personal Protective Equipment Selection

	Task	PPE Level	Type Of Chemical Protective Coverall	Inner Glove	Outer Glove	Head	Eye/ Face	Foot	Respirator Type	Air Purifying Respirator Cartridge & Changeout Schedule	Hearing Protection
1	Mobilization	D	Work clothes	N/A	Leather Palmed Work Gloves	Hard Hat	Safety Glasses	Steel Toe Boots	None	N/A	Ear Plugs as needed
2a	Clearing & Grubbing – <u>Excavator</u> ¹	D or C <i>Dependent upon SSHO determination</i>	Work clothes	N/A	Leather Palmed Work Gloves	Hard Hat	Safety Glasses	Steel Toe Boots	None, if SSHO determines dust suppression is adequate; If SSHO determines dust suppression is not adequate, Full Face Air Purifying Respirator	N/A if dust suppression is adequate; P-100 Cartridge if Full Face Air Purifying Respirator is required. Cartridges changed if breathing is impaired or at the end of each day, whichever occurs first.	Ear Plugs as needed

	Task	PPE Level	Type Of Chemical Protective Coverall	Inner Glove	Outer Glove	Head	Eye/Face	Foot	Respirator Type	Air Purifying Respirator Cartridge & Changeout Schedule	Hearing Protection
2b	Clearing – <u>Chain Saw</u> ¹	D or C <i>Dependent upon SSHO determination</i>	Work Clothes; Leather chaps	N/A	Kevlar Gloves	Hard Hat	Safety Glasses; Face Shield	Steel Toe Boots	None, if SSHO determines dust suppression is adequate; If SSHO determines dust suppression is not adequate, Full Face Air Purifying Respirator	N/A if dust suppression is adequate; P-100 Cartridge if Full Face Air Purifying Respirator is required. Cartridges changed if breathing is impaired or at the end of each day, whichever occurs first.	Ear Plugs or Ear Muffs
2c	Clearing – <u>Chipping Brush</u> ¹	D or C <i>Dependent upon SSHO determination</i>	Work Clothes	N/A	Kevlar Gloves	Hard Hat	Safety Glasses; Face Shield	Steel Toe Boots	None, if SSHO determines dust suppression is adequate; if SSHO determines dust suppression is not adequate, Full Face Air Purifying Respirator	N/A if dust suppression is adequate; P-100 Cartridge if Full Face Air Purifying Respirator is required. Cartridges changed if breathing is impaired or at the end of each day, whichever occurs first.	Ear Plugs or Ear Muffs

Task		PPE Level	Type Of Chemical Protective Coverall	Inner Glove	Outer Glove	Head	Eye/Face	Foot	Respirator Type	Air Purifying Respirator Cartridge & Changeout Schedule	Hearing Protection
3a	In-situ Treatment, application and mixing of Ecobond® Pb	D or C <i>Dependent upon SSHO determination</i>	Work Clothes-coveralls Durafab® or KleenGard® Attached hood and elastic wrist and ankle bands may be required to cover all exposed skin if dust control is inadequate or material is handled by other than mechanical means.	Nitrile	Nitrile covered by leather palmed work glove as needed	Hard Hat	Fully Sealed (and vented) Safety Goggles	Steel Toe Boots with dust cover or PVC Boots	None if SSHO determines dust suppression is adequate; If SSHO determines dust suppression is not adequate, Full Face Air Purifying Respirator	N/A if dust suppression is adequate; P-100 Cartridge if Full Face Air Purifying Respirator is required. Cartridges changed if breathing is impaired or at the end of each shift, whichever occurs first.	Ear Plugs

Task		PPE Level	Type Of Chemical Protective Coverall	Inner Glove	Outer Glove	Head	Eye/Face	Foot	Respirator Type	Air Purifying Respirator Cartridge & Changeout Schedule	Hearing Protection
3b	Soil excavation and Soil Loading ¹	D or C <i>Dependent upon SSHO determination</i>	Work Clothes- coveralls (Durafab® or KleenGard® Attached hood may be required if dust control is inadequate	Nitrile	Nitrile covered by leather palmed work glove as needed	Hard Hat	Safety Glasses	Steel Toe Boots with dust cover or PVC Boots	None, if SSHO determines dust suppression is adequate; If SSHO determines dust suppression is not adequate, Full Face Air Purifying Respirator	N/A if dust suppression is adequate; P-100 Cartridge if Full Face Air Purifying Respirator is required. Cartridges changed if breathing is impaired or at the end of each day, whichever occurs first.	Ear Plugs
4a	Collect Soil Samples ¹	D or C <i>Dependent upon SSHO determination</i>	Tyvek	Nitrile Surgical	<u>Nitrile Surgical</u> (2 nd pr.) & Leather Palmed Work Gloves	Hard Hat	Safety Glasses	Steel Toe Boots w/Latex Over Boot or PVC boots	None, if SSHO determines dust suppression is adequate; if SSHO determines dust suppression is not adequate, use Full Face Air Purifying Respirator	N/A if dust suppression is adequate; P-100 Cartridge if Full Face Air Purifying Respirator is required. Cartridges changed if breathing is impaired or at the end of each day, whichever occurs first.	Ear Plugs as needed

Task		PPE Level	Type Of Chemical Protective Coverall	Inner Glove	Outer Glove	Head	Eye/Face	Foot	Respirator Type	Air Purifying Respirator Cartridge & Changeout Schedule	Hearing Protection
4b	Homogenize Soil Samples for consolidation into single sample ¹	D or C <i>Dependent upon SSHO determination</i>	Coveralls (Durafab® or KleenGard®)	Nitrile Surgical	<u>Nitrile Surgical</u> (2 nd pr.) & Leather Palmed Work Gloves	Hard Hat	Safety Glasses	Steel Toe Boots w/Latex Over Boot	None, if SSHO determines dust suppression is adequate; if SSHO determines dust suppression is not adequate, use Full Face Air Purifying Respirator	N/A if dust suppression is adequate; P-100 Cartridge if Full Face Air Purifying Respirator is required. Cartridges changed if breathing is impaired or at the end of each day, whichever occurs first.	Ear Plugs as needed
5	Placing fabric warning barrier ¹	D or C <i>Dependent upon SSHO determination</i>	(Durafab® or KleenGard®)	Nitrile Surgical	<u>Nitrile Surgical</u> (2 nd pr.) & Leather Palmed Work Gloves	Hard Hat	Safety Glasses	Steel Toe Boots w/Latex Over Boot	None, if SSHO determines dust suppression is adequate; If SSHO determines dust suppression is not adequate, use Full Face Air Purifying Respirator	N/A if dust suppression is adequate; P-100 Cartridge if Full Face Air Purifying Respirator is required. Cartridges changed if breathing is impaired or at the end of each day, whichever occurs first.	Ear Plugs as needed

	Task	PPE Level	Type Of Chemical Protective Coverall	Inner Glove	Outer Glove	Head	Eye/Face	Foot	Respirator Type	Air Purifying Respirator Cartridge & Changeout Schedule	Hearing Protection
6	Backfilling & Regrading	D	Work Clothes	N/A	Work Gloves	Hard Hat	Safety Glasses	Steel Toe Boots	N-95 dust mask, as needed.	N/A	Ear Plugs
7a	Aggregate Placement	D	Work Clothes	N/A	Work Gloves	Hard Hat	Safety Glasses	Steel Toe Boots	None	N/A	Ear Plugs
7b	Asphalt Cap	D	Work Clothes	N/A	Work Gloves	Hard Hat	Safety Glasses	Steel Toe Boots	None	N/A	Ear Plugs
8	Restoration – Seeding	D	Work Clothes	N/A	Work Gloves	Hard Hat	Safety Glasses	Steel Toe Boots	None	N/A	Ear Plugs as needed
9	Site Survey	D	Work Clothes	N/A	Work Gloves	Hard Hat	Safety Glasses	Steel Toe Boots	None	N/A	Ear Plugs as needed
10	Demobilization	D	Work clothes	N/A	Leather Palmed Work Gloves	Hard Hat	Safety Glasses	Steel Toe Boots	N/A	N/A	Ear Plugs as needed

¹ Tasks are likely to occur in or close to the Exclusion Zone, or tasks performance will require handling contaminated soil or materials, therefore, exposure to lead and lead-contaminated dust is possible.

Abbreviations and Acronyms:

- N/A – not applicable
- PPE – personal protective equipment
- PVC – polyvinyl chloride
- SSHO – Site Safety and Health Officer

If visible dust is present at any time during excavation activity and dust suppression techniques are not effective, Level C respiratory protection and PPE will be required of all site workers. If dust control is not maintained effectively, full-face respirators with P-100 cartridges will be worn. EHS 5-2 is the SES-TECH written Respiratory Protection Program. Workers who wear respirators must comply with all provisions of the procedure. Disposable dust masks are not acceptable. Also, if dust cannot be controlled, workers will upgrade their PPE to a coverall with attached hood to protect the head and neck from exposure to the dust. Cartridges will be changed if breathing is impaired by accumulation of dust in the cartridge, at the end of each shift, or after 10-hours whichever occurs first. If the respirator is exposed to visible dust on the cartridge, the cartridge will be changed out after leaving the exclusion zone (EZ) and a new cartridge will be installed before returning to the EZ.

Effective soil excavation techniques, such as keeping the soil slightly moist and using a fine water mist will provide adequate dust suppression to prevent potential exposure through inhalation. Strict adherence to dust suppression effectiveness, decontamination, and personal hygiene procedures will effectively eliminate skin contact and ingestion as potential routes of exposure.

(Note: Direct load truck drivers are not subject to provisions for PPE in the SSHP as the drivers will not be permitted to exit vehicles in the [EZ]).

7.0 AIR MONITORING

This section addresses the air monitoring that will be conducted, including instrumentation selection, frequency, and location of monitoring. In the preparation of this section the following discussion describes the process on how the monitoring was specified for this project.

Specified protocols regarding handling of lead contaminated soil fully considered the requirements of the lead standards (29 CFR 1926.62).

The following is the rationale used:

Some areas along the road have concentrations of lead in soil that exceeds 2,500 mg/kg. The CIH specifies this as the maximum level in soil that without effective dust control methods that workers could be exposed to levels above the OSHA action level for lead ($25 \mu\text{g}/\text{m}^3$). This level is calculated using a scenario where the dust is in excess of $10 \text{ mg}/\text{m}^3$. Since such a concentration of dust in the air is impossible to see through, it obviously impossible to work under those conditions. In fact dust levels in excess of $5 \text{ mg}/\text{m}^3$ are very difficult to work in.

This project requires effective dust control with no visible dust permitted during work activities.

In those areas where soil concentrations are above 2,500 mg/kg, the CIH has specified that selected ground workers in those areas be monitored using personal air sampling pumps to validate that they are being adequately protected by dust control measures. If not, then better dust control measures with respiratory protection of workers would be required. It is highly unlikely that with effective dust control, workers will be exposed to lead above action levels.

Initial determinations are based on the criteria specified above (calculations) and by the experience of the CIH with similar sites. The major criteria are that there is no dust in the air. If there is ineffective dust control, all work will stop and workers will be required to be placed in level C protection, personal air sampling will be performed, and workers will remain in level C protection until either dust control measures are effective (no dust in air) or air monitoring results indicate exposures are consistently below

25 $\mu\text{g}/\text{m}^3$. The effective techniques are continuing suppression of dust by using water mists and water on top of road. Also, as loads are placed into containers or dump trucks, the loader must not drop the load from height but rather by pouring just over the top of the opening in the container or dump. Operators will not use any technique that produces dust when loading containers or trucks. Covers to containers must be secure before transportation. Dump trucks must be tarped before leaving the site.

7.1 Real-Time Air Monitoring

There is no instrument that measures total dust in real time. Respirable aerosol monitors (RAMs) do not measure total dust. The respirable fraction is not sufficient to establish exposure. Even if used, the RAM would not have the sensitivity necessary to measure the potential exposure to the high levels of lead that are present in the soil.

For on-site activities, dust control is essential. If dust is not sufficiently controlled, personnel will be required to wear a full face air purifying respirator outfitted with P-100 cartridges.

The SSHO will be responsible for determining if dust suppression measures are sufficient to prevent visible dust (thus decreasing the potential for worker exposure to site contaminants). This includes any task involving soil that is contaminated with lead (CH2M HILL RI, 2010).

If the SSHO determines that visible dust is present during any activity that involves the disturbance of soil (i.e., creates potential worker exposure via inhalation to lead), the respiratory protection PPE shall be upgraded to Level C per the requirements listed in Table 7-1. The upgrade shall be documented in the site logbook.

7.2 Integrated Air Monitoring

Integrated air monitoring will be performed at the site. Personal sampling pumps will be utilized to collect samples for laboratory analysis for lead by NIOSH Method 7300. 29 CFR 1926.62 (d) specifies air monitoring requirements for lead. Samples will be collected from site workers involved in activities where exposure to lead via dust inhalation is possible. To validate the premise that dust control is adequate to protect workers:

- Personal air samples will be collected from ground workers excavating in grids SO17 through SO22. (Note: These grids were selected based on the soil analysis that indicated the highest levels of lead were in these grids.)
- Two samples will be collected from two workers in a grid selected from this range of grids or if working in more than one of these grids in an 8-hour day.
- This sampling will be repeated on another day in grids different from the grids used in the first collection but still within the range of grid numbers specified. Samples will be collected using NIOSH analytical methods as directed by the CIH. Analysis will be performed only by an AHA accredited laboratory. A quick turnaround time will be requested. All results will be forwarded to the CIH immediately upon receipt.
- Samples will also be collected for total dust using NIOSH Method 0500. The SSHO will be given complete sampling and handling instructions by the Project CIH. Guidance is also available in Health and Safety Guideline HSG 1-1 Air Sampling Pumps. The attachment form found in that guideline will be used.

Table 7-1 Real-Time Air Monitoring

Air Monitoring Instrument	Monitoring Location	Action Level	Site Action	Reason
Note: No instrument measures total dust in real time. RAMs do not measure total dust and do not have the sensitivity necessary to measure the potential exposure to the high levels of lead present in the soil at this site.	Dust Suppression Measures shall be used during all soil-disturbing activities to adequately control dust.	DUST IS ADEQUATELY CONTROLLED	Level D Respiratory Protection PPE specified in Table 6-1 is required.	Lead exposure by inhalation is not considered a health hazard if dust suppression is sufficient.
		DUST NOT ADEQUATELY CONTROLLED	Level C Respiratory Protection PPE specified in Table 6-1 is required. Consists of full-face respirator with P-100 cartridges. Contact PESM.	Potential for exposure to lead via inhalation of particulates.

Abbreviations and Acronyms:

PESM – Project Environmental Safety Manager
 PPE – personal protective equipment
 RAM – real-time aerosol monitor

7.3 Data Quality Assurance

7.3.1 Calibration

Instrument calibration will be documented and included in a dedicated Health and Safety Logbook or on separate calibration pages. The sampling pumps will be calibrated before and after each sampling event.

7.3.2 Operations

All instruments will be operated in accordance with the manufacturer's specifications. Manufacturers' literature, including an operations manual for each piece of air monitoring equipment, will be maintained on-site by the SSHO for reference.

7.3.3 Data Review

After receipt of laboratory analysis of collected air samples, the SSHO will review the monitoring and sampling data with the PESM to evaluate the potential for worker exposure and upgrades/downgrades in level of protection.

7.4 Noise Monitoring

Noise monitoring will not be conducted. All employees receive pre-employment audiograms. Hearing protection devices will be worn by workers in proximity to heavy equipment and power tools.

8.0 ZONES, PROTECTION, AND COMMUNICATION

8.1 Site Control

Portions of this project may be considered to be hazardous waste remediation, and any person working in an area where the potential for exposure to site contaminants exists will be allowed access only after providing the SSHO with evidence of proper training and medical documentation.

8.2 Site Zones

Site zones are intended to control the potential spread of contamination throughout the site and ensure that only authorized individuals are permitted into potentially hazardous areas. When working in contaminated areas, a three-zone approach will be utilized. It shall include an Exclusion Zone (EZ), Contamination Reduction Zone (CRZ), and a Support Zone (SZ).

The following shall be used for guidance in developing these preliminary zone designations.

Support Zone – The SZ is an uncontaminated area that will be the support area for most operations. The SZ provides for communications and staging for emergency response. Appropriate sanitary facilities and safety equipment will be located in this zone. Potentially contaminated personnel/materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples.

Contamination Reduction Zone – The CRZ is established between the EZ and the SZ. The CRZ contains the contamination reduction corridor and provides an area for decontamination of personnel and portable hand-held equipment, tools, and heavy equipment. A personnel decontamination area will be prepared at the EZ for personnel/soil sampling equipment. A second decon station will be used as the decon pad for dry decon of heavy equipment. Heavy gauge plastic sheeting shall serve as the material of construction for the heavy equipment dry decon pad. The CRZ will be used for EZ entry and egress in addition to access for heavy equipment and emergency support services.

Exclusion Zone – Any areas that have activities involving soil disturbance, personnel working on/near excavated soil surfaces, or the loading of soil into trucks are considered EZs. Any other locations that may involve the potential for exposure to site contaminants, hazardous materials, and/or hazardous conditions, should also be considered an EZ.

8.3 Contamination Control

8.3.1 Personnel Decontamination Station

Personnel hygiene, coupled with diligent decontamination of equipment used in soil sampling and excavation will significantly reduce the potential for exposure of off-site areas to contaminants from the site. At a minimum, all personnel will thoroughly wash their arms, face, and hands prior to eating, drinking, smoking, applying cosmetics, or any other actions that would increase the risk of hand-to-mouth transfer of contaminants.

8.3.2 Minimization of Contact with Contaminants

During completion of all site activities, personnel should attempt to minimize contact with contaminated materials. This involves a conscientious effort to keep “clean” during site activities. All personnel should minimize kneeling, splash generation, and other physical contact with contamination. This may

ultimately minimize the degree of decontamination required and the generation of waste material from site operations.

Field procedures will be developed to control visible dust during dry decontamination of heavy equipment to ensure that unprotected personnel working nearby or entering Oceana Salvage via Oceana Salvage Yard Access Road are not affected.

8.3.3 Personnel Decontamination Sequence

Consideration will be given to prevailing wind directions so that the decontamination line, the SZ, and the CRZ exit are upwind of the EZ and the first stations of the decontamination line. Personnel and equipment leaving the EZ shall be thoroughly decontaminated. The following protocol shall be used for the decontamination stations according to levels of protection (Table 8-1):

Table 8-1 Decontamination Sequence

Level D	Modified Level D	Level C
1. Equipment drop	1. Equipment drop	1. Equipment drop
2. Hand/Face wash	2. Outer boot & glove wash	2. Outer boot & glove wash
	3. Outer boot & glove rinse	3. Outer boot & glove rinse
	4. Tape removal – boot & glove	4. Tape removal – boot & glove
	5. Outer boot & glove removal/disposal	5. Outer boot & glove removal/disposal
	6. Coverall removal/disposal	6. Coverall removal/disposal
	7. Inner glove removal/disposal	7. Respirator removal
	8. Hand/Face wash	8. Inner glove removal/disposal
		9. Inner clothing removal
		10. Hand/Face wash
		11. Respiratory cleaning/sanitizing

At a minimum, all personnel will thoroughly wash their arms, face, and hands upon exiting the EZ or CRZ prior to eating, drinking, smoking, applying cosmetics, or any other actions that would increase the risk of hand-to-mouth transfer of contaminants.

The following decontamination equipment is required for work that requires a wet decontamination for modified level D and higher protection levels:

- Two small tubs (two sets of wash and rinse water), scrub brush, towels, contaminated clothing disposal bag or drum, and, respiratory protective equipment cleaning solution.
- Nonphosphate detergent (e.g., Dove[®]) and water should be sufficient for use as the decontamination solution for personnel or PPE equipment decontamination (i.e., equipment that personnel may wear).
- Alconox[®] or other nonphosphate detergent can be used for equipment decontamination (i.e., hand tools, sampling equipment).

All receptacles for contaminated protective clothing will be equipped with lids that can be closed to prevent the release of contaminants and the collection of rainfall. The decontamination liquids and clothing will be contained and disposed of according to federal, state, and local regulations.

8.3.4 Emergency Decontamination

If circumstances dictate that contaminated clothing cannot be readily removed, then remove gross contamination; wrap injured personnel with clean garments/blankets to avoid contaminating other personnel or transporting equipment.

If the injured person can be moved, he/she will be moved to the EZ boundary and de-contaminated by site personnel as described above before emergency responders handle the victim. If the person cannot be moved because of the extent of the injury (a back or neck injury), then polyethylene plastic sheeting will be laid down over the work surface and around the victim to allow a clean pathway for response personnel to access the victim. If the potential for inhalation hazards exist, such as with open excavation, this area will be covered with polyethylene to eliminate any potential inhalation hazards.

All emergency personnel are to be immediately informed of the injured person's condition and potential contaminants, and be provided with all pertinent chemical data.

8.3.5 Protection Required for Decontamination Personnel

Personnel assisting with decontamination will wear the same level of protection as those they are decontaminating, or one level below, depending on the stage of decontamination that they are assisting. Assistants who are stationed at the CRZ will be in the same level of protection as those being assisted. At stages where the outer garments are already removed and containerized, the decontamination assistants will wear the lower level of protection.

8.3.6 Soil Sampling Equipment Decontamination

Handheld equipment includes all soil sampling instruments, samples, sample mixing bowls, hand tools, and notebooks. The soil sampling tool decontamination station will consist of small tubs of water and Alconox. These items must be decontaminated or discarded as waste prior to removal from the EZ.

Decontamination shall take place on a decon pad and all liquids used in the decontamination procedure will be collected, stored, and disposed in accordance with federal, state, and local regulations.

8.3.7 Heavy Equipment Decontamination

A decon pad consisting of plastic sheeting will be utilized to collect heavy equipment dry decon spoils. Decontamination of heavy equipment will be accomplished using dry decontamination with brushes and shovels. A misting hose or sprayer will be used during dry decontamination to prevent dust emissions. It is not anticipated that pressure washing or decontamination with water will be required. Vehicles or equipment that are brought into an EZ will be treated as contaminated, and will be decontaminated prior to removal.

8.4 Communication

Cell phones are the primary mode for site communication and control:

- Cell phones may be utilized as needed when personnel are in the SZ or off-site.

- For emergency communication purposes, a cell phone is permitted in the heavy equipment.

8.5 Local Emergency Support Units

Local emergency support units are available by dialing 911. Cell phones will be utilized as appropriate for communication with emergency support units.

9.0 MEDICAL SURVEILLANCE PROCEDURES

The Corporate Medical Consultant is with WorkCare, located in Anaheim, California. Dr. Peter Greaney, the Director, is board-certified in occupational medicine and may be reached at (800) 455-6155. WorkCare uses associated doctors and clinics throughout the United States and can be contacted 24 hours a day.

9.1 Medical Surveillance Requirements

All personnel performing fieldwork, where potential exposure to contaminants exists, are required to have completed and passed a medical surveillance examination in accordance with 29 CFR 1910.120(f) and as required by 29 CFR 1926.62(j). Prior to working on-site, personnel must present, to the SSHO, a physician's medical release for work. The SSHO must confirm the medical release before an employee can work in the EZ.

The medical examination shall be taken annually, at a minimum, and upon termination of hazardous waste site work if the last examination was not taken within the previous 6 months. Additional medical testing may be required by the PESM in consultation with the corporate medical consultant and the SSHO if an over-exposure or accident occurs, if an employee exhibits symptoms of exposure, or if other site conditions warrant further medical surveillance.

Due to the presence of high levels of lead in the soil, baseline blood levels of lead shall be established for workers prior to mobilization. All site workers who will participate in on-site activities shall require additional medical protocol for blood lead and zinc protoporphyrin (ZPP.)

Blood lead and ZPP blood draw protocol shall be added to laboratory suites for all site workers at the completion of the project (or termination of employment, whichever comes first). The SSHO will coordinate with and send the names of all personnel to WorkCare so they can schedule the tests, especially for those personnel who do not need a full physical (as they are current in their annual/biennial physical exam cycle).

(Note: Truck drivers who are engaged in hauling direct load excavated soil for off-site disposal will not be subject to the 29 CFR 1910.120 medical surveillance requirements of the SSHP.)

9.2 Medical Data Sheet

A medical data sheet is provided in Appendix D. Completion of this medical data sheet is voluntary, but it is recommended to be completed by all on-site personnel and will be maintained at the site. Where possible, this medical data sheet will accompany the personnel needing medical assistance.

10.0 SAFETY CONSIDERATIONS

10.1 General Health and Safety Work Rules

A list of work rules and general safe work practices has been included from the SES-TECH procedure EHS 3-6, Attachment C of the APP. These rules have been incorporated into Appendix E of this SSHP. The work rules will be posted in a conspicuous location at the site.

11.0 WASTE DISPOSAL PROCEDURES

Discarded materials may create a sanitary hazard. Nonhazardous wastes will be managed in accordance with VDEQ regulations for solid waste.

Lead is a RCRA characteristic waste D008 at 5 parts per million (ppm) based on Toxicity Characteristic Leaching Procedure (TCLP) lead analysis; therefore, off-site disposal of hazardous wastes will be managed in accordance with RCRA and VDEQ regulations. Final classification and disposal of hazardous wastes are contingent upon analytical results and the disposal facility requirements.

All disposal facilities and transporters used for off-site disposal will be approved in accordance with SES-TECH Corporate Regulatory Compliance Procedure and will be approved by the Navy prior to use. SES-TECH will prepare all waste documentation (profiles, Bills of Lading, manifests) for Navy review and signature. SES-TECH personnel will not sign any waste documentation unless written authorization is provided by the Navy and approval is obtained from SES-TECH legal department.

See the Oceana Salvage Yard Access Road Waste Management Plan for further details and discussion of site waste management practices.

12.0 EMERGENCY RESPONSE PLAN

This section establishes procedures and provides information for use during a project emergency. Emergencies can happen unexpectedly and require an immediate response. Therefore, contingency planning and advanced training are essential.

12.1 Responsibilities

12.1.1 Project Environmental Safety Manager

The PESM is Roger Margotto, CIH, Certified Safety Professional (CSP). The PESM oversees and approves the Emergency Response/Contingency Plan and performs audits to assess whether the plan is in effect and whether all pre-emergency requirements are met. The PESM acts as a liaison to applicable regulatory agencies and notifies OSHA of reportable accidents.

12.1.2 SSHO/Emergency Coordinator

The SSHO/Emergency Coordinator is Jerrett Patterson. The Emergency Coordinator shall implement the Emergency Response/Contingency Plan whenever conditions at the site warrant such action. The SSHO/Emergency Coordinator is responsible for evacuating the site safely. The SSHO/Emergency Coordinator is required to immediately notify the PESM of any fatalities or catastrophes (three or more workers injured and hospitalized) so that the PESM can notify OSHA within the required time frame. The PESM will be notified of all OSHA recordable injuries, fires, spills, releases or equipment damage in excess of \$500 within 24 hours.

The SSHO/ Emergency Coordinator shall verify emergency phone numbers and confirm hospital routes at mobilization.

12.1.2.1 Emergency Reporting

SES-TECH corporate procedure EHS 1-7, Event Reporting and Investigation (Attachment C of the APP), details the procedures and the forms used by SES-TECH for event investigation including site emergencies. When an incident occurs, the SSHO will immediately notify the PM and PESM and the PM will notify the contract Program Manager. If the incident is an OSHA recordable injury or exceeds \$20,000 in property damages, the PM will immediately notify the Remedial Project Manager (RPM) or Facilities Engineering and Acquisition Division (FEAD).

The current NAVFAC EMAC Contract RPM (Krista Parra). The NAVFAC EMAC Contract FEAD is Harold Bishop.

After the event report of incident is completed, the SSHO must submit a draft written SES-TECH event report within 24 hours. Within 10 days of occurrence, a completed investigation report must be submitted to the PESM. All reports are reviewed by the PM and the PESM. Within the reporting system, corrective actions and persons responsible for those corrective actions are identified. The system requires follow-up to ensure completion of corrective actions.

Report of applicable accidents or incidents shall be made to the RPM/FEAD as soon as possible, but not more than 24 hours after occurrence. The PM or the SSHO will complete an Incident Report as required for any OSHA recordable injury. Investigation and corrective actions shall be submitted to RPM/FEAD no later than 5 working days following the incident. Corrective actions shall be implemented as soon as reasonably possible.

The PM or the SSHO will immediately notify the RPM/FEAD in the event of:

- A fatal injury
- A permanent total disability
- A permanent partial disability
- The hospitalization of three or more people resulting from a single occurrence
- Property damage of \$20,000 or more

12.2 Communication

Two methods of communication may be utilized during emergency situations:

- Radios will be the primary means of communication on-site and within the EZ.
- Cell phones may be utilized when personnel are in the SZ or temporarily off-site.

12.3 Local Emergency Support Units

To assist with any emergency that might occur at the site, a copy of Table 12-1, Emergency Telephone Numbers, will be kept in a readily visible location in the SZ and/or in the site vehicles.

Appendix F includes a route map from the site to the nearest hospital. This and other maps will be posted adjacent to the list of emergency telephone numbers in the SZ and also shall be placed in all on-site vehicles. **The Hospital for EMERGENCY CARE is: Sentara Virginia Beach General Hospital**

Site Address for the Oceana Salvage Yard Access Road NTCRA: 1040 Oceana Blvd.
 Virginia Beach, VA

Table 12-1 Emergency Telephone Numbers

Contact	Agency or Company	Telephone Number
Police	City of Virginia Beach	911
Fire	City of Virginia Beach	911
Ambulance	City of Virginia Beach	911
Hospital – EMERGENCY	Sentara Virginia Beach General 1060 First Colonial Road Virginia Beach, VA 23454	(757) 395-8000
Ambulance Virginia Beach Emergency Medical Services (EMS)	477 Viking Drive, Suite 130 Virginia Beach, VA 23452	Land Line: Dial 311 Mobile: (757) 385-311
Police Virginia Beach	2509 Princess Anne Road Virginia Beach, VA 23456	(757) 385-4141
Fire Department Virginia Beach	21 Municipal Center Drive	(757) 385- 4228
State Police Virginia	814 Kempsville Road, Suite 105 Norfolk, VA 23502	Norfolk/VB: (757) 455-3980
Work Care Clinic NONEMERGENCY	I&O Medical Center 1290 Diamond Springs Road Virginia Beach, VA 23455	(757) 460-0700
Dr. Peter Greaney	Work Care (Occupational Doctor)	(800) 455-6155
Poison Control Center	National Contact	(800) 222-1222
National Response Center	National Contact	(800) 424-8802
Krista Parra	NAVFAC EMAC RPM	(757) 341-0395
Harold Bishop	NAVFAC OCEANA FEAD	(757) 342-4295
John Dormi	SES-TECH – Norfolk, VA Office Project Manager	Cell: (757) 685-9566
Roger Margotto, CIH, CSP	SES-TECH – San Diego, CA PESM	Office: (619) 471-3503 Cell: (619) 988-0520
Jerrett Patterson	SES-TECH – Poulsbo, WA SSHO	Cell (360) 434-5449

Abbreviations and Acronyms:

CIH – Certified Industrial Hygienist
CSP – Certified Safety Professional
EMAC – Environmental Multiple Award Contract
EMS – Emergency Medical Services
FEAD – Facilities Engineering and Acquisitions Division
NAVFAC – Naval Facilities Engineering Command
PESM – Project Environmental Safety Manager
RPM – Remedial Project Manager
SES-TECH – Sealaska Environmental Services, LLC, and Tetra Tech EC, Inc.

12.4 Emergency Medical Treatment

The procedures and rules in this SSHP are designed to prevent employee injury. However, should an injury occur, no matter how slight, it must be immediately reported to the SSHO.

The injury notification procedures in ZIP Bulletin 108 in Appendix G shall be followed.

During the site-specific safety training/orientation, project personnel will be informed of the location of the first aid station(s). Unless they are in immediate danger, injured persons will not be moved until paramedics can attend to them. Some injuries, such as severe cuts and lacerations or burns, may require immediate treatment.

Only in nonemergency situations will an injured person be transported to the hospital by means other than an ambulance.

12.4.1 Emergency Medical Treatment

First-aid equipment will be available on-site at the following locations:

- First Aid Kit : SZ and/or Site Vehicle
- Sorbent Pads: SZ and/or Site Vehicle
- American National Standards Institute (ANSI) Z385 Approved Emergency Eye Wash: and/or Site Vehicle (Eye wash must be capable of delivering 0.4 gallon per minute for 15 minutes)

Two individuals who have current qualification/certification in first aid and cardiopulmonary resuscitation (CPR) will be on-site at all times.

12.4.2 Emergency Response

Some physical signs/symptoms that require emergency medical treatment and a call to 911 include: chest pain, difficulty breathing, uncontrolled bleeding, bone fracture, loss of consciousness, severe head injury, poisoning, shock, loss of limb, and sudden and prolonged dizziness.

In an emergency situation:

- Call 911 for initial employee evaluation and possible transportation to hospital via EMS.
- A designated SES-TECH employee shall accompany the injured worker to the hospital.
- If trained, administer first aid to minimize the injury effects.

- Call WorkCare at (800) 455-6155 for a triage call/discussion with an Occupational Health Nurse or physician.
- Mention to WorkCare representative ASAP that the call is regarding an emergency injury.
- Provide the following information to WorkCare:
 - Name of person calling
 - Contact phone number
 - Location calling from
 - Name of individual injured
 - Date and type of injury
- During WorkCare off-hours, dial the 800 number.
- A WorkCare health care representative will call you back shortly.
- Do not delay treatment while awaiting a return phone call.
- Call the PESM and PM immediately.

12.4.3 Nonemergency Response

In a nonemergency situation:

- If trained, administer first aid to minimize the injury effects.
- Call WorkCare at (800) 455-6155 for a triage call/discussion with an Occupational Health Nurse or physician. Mention ASAP that the call is regarding an injury. The Occupational Health Nurse will assist the supervisor to determine the best treatment plan. A WorkCare health care representative will call you back shortly. Do not delay treatment while awaiting a return phone call.
- Provide the following information to WorkCare:
 - Name of person calling
 - Contact phone number
 - Location calling from
 - Name of individual injured
 - Date and type of injury.
- Call the PESM and PM.
- Call the local WorkCare clinic to notify them that you are bringing an injured worker to their clinic for evaluation.
- You may transport the injured employee to the local clinic in a privately owned vehicle. A designated SES-TECH employee must accompany the injured worker to the local clinic.

The WorkCare Clinic for Nonemergency injuries at the site is:

I&O Medical Center
1290 Diamond Springs Road

Virginia Beach, VA 23455
(757) 460-0700

The map to the WorkCare Clinic can be found in Appendix F of this SSHP.

12.4.4 Emergency Site Evacuation Routes and Procedures

To mobilize the manpower resources and equipment necessary to cope with a fire or other emergency, a clear chain of authority will be established. The Emergency Coordinator will take charge of all emergency response activities and dictate the procedures that will be followed for the duration of the emergency.

The Emergency Coordinator will report immediately to the scene of the emergency, assess the seriousness of the situation, and direct whatever efforts are necessary until the emergency response units arrive. At his/her discretion, the Emergency Coordinator also may order the closure of the site for an indefinite period. All project personnel will be instructed on proper emergency response procedures and location of emergency telephone numbers during the initial site-specific safety training.

During an emergency, if additional traffic control measures are necessary, a project team member trained in these procedures and designated by the SSHO will take over these duties until local police and fire fighters arrive.

The Emergency Coordinator will remain at the site to provide any assistance requested by emergency-response squads as they arrive to deal with the situation. A map showing evacuation routes, meeting places and location of emergency equipment will be included in site-specific training/orientation and will be posted in the site vehicles.

12.4.4.1 Evacuation Route/Rally Point/Head Count Procedure

The rally point for emergency evacuation of the site is:

- **To be determined by the SSHO upon mobilization**

In the event of an emergency evacuation, a head count of individuals on-site will be performed.

12.4.5 Evacuation Drills

Due to the short duration of field activities on-site, evacuation drills may not be conducted. Emergency drills, if conducted, shall be structured to simulate potential emergency situations that may occur. The PESM may perform an unannounced simulated emergency situation at any time in order to evaluate the emergency response awareness and emergency evacuation effectiveness.

12.5 Fire Prevention and Protection

In the unlikely event of a fire or explosion, emergency response procedures will include:

- Immediate evacuation of the site
- Assembly at the designated rally point
- Notification of local fire and police departments

No personnel will fight a fire beyond the incipient stage unless trained in the proper use of fire extinguishers and if the fire can be put out with a portable extinguisher in 30 seconds or less (incipient stage).

Adhering to the following precautions will prevent fires:

- Good housekeeping and proper storage of flammable materials
- Smoking only in areas designated by SSHO
- Performing monthly inspections of fire extinguishers

The locations of all on-site fire extinguishers shall be presented in the site-specific safety training. The person responsible for the maintenance of fire prevention and/or fire suppression equipment is the SSHO.

12.6 Accident/Incident Reporting

As soon as first aid and/or emergency response needs have been met, the following parties are to be contacted by telephone:

1. Roger Margotto; PESM: Office: (619) 471-3503; Cell: (619) 988-0520
2. John Dormi; SES-TECH Project Manager: Cell: (757) 685-9566
3. Harold Bishop – NAS Oceana FEAD: (757) 342-4295
4. The employer of any injured worker: (if not a SES-TECH employee)

Electronic/written confirmations of verbal reports are to be submitted within 24 hours of event, as detailed in Section 12.1.2.1, Emergency Reporting, of this SSHP.

12.7 Adverse Weather Conditions

In the event of adverse weather conditions, the SSHO will determine if work can continue safely. Some of the issues to consider when determining if work can continue safely are:

- Hail, rain, snow, ice, high winds
- Limited visibility (fog)
- Potential for electrical storms

12.8 Spill Control and Response

All small hazardous spills/environmental releases shall be contained as close to the source as possible. Whenever possible, the MSDS should be consulted to assist in determining the best means of containment and cleanup. For small spills, absorbent materials such as sand, sawdust, or commercial absorbents should be placed directly on the substance to contain the spill and aid recovery. An area 50 to 100 feet around the spill area should be established depending on the size of the spill.

- In event of a spill, the SSHO/ Emergency Coordinator will determine the nature of the spill, ensure the safety of any individual in the area, and notify appropriate EMS/Emergency Response authorities.

- If a flammable liquid, gas, or vapor is involved, the SSHO shall remove all ignition sources and use non-sparking and/or explosive-proof equipment to contain or clean up the spill (diesel-only vehicles, air operated pumps, etc.)
- The spill shall be reported to the PM, FEAD, and RPM.
- For additional regulatory compliance support, the SES-TECH Environmental Specialist will be contacted.

12.9 Emergency Equipment

The following minimum emergency equipment shall be kept and maintained on-site:

- Industrial first aid kit
- Portable eye washes meeting the latest requirements of ANSI Z358.1
- Fire extinguishers (one per trailer/vehicle, hot work station, each piece of heavy equipment)
- Cell phones, air horn
- Absorbent material

12.10 Postings

The following information shall be developed and carried in the site vehicles:

- Emergency telephone numbers
- Diagrams showing the location of fire extinguishers and emergency equipment
- Emergency exit, evacuation routes, and staging area
- Route to the hospital

12.11 Restoration and Salvage

After an emergency, prompt restoration of utilities, fire protection equipment, medical supplies, and other equipment will reduce the possibility of further losses. Some of the items that may need to be addressed are:

- Refilling fire extinguishers
- Refilling medical supplies
- Recharging eyewash
- Replenishing spill control supplies

13.0 TRAINING

13.1 Site-Specific Health and Safety Training/Orientation

Site-specific training/orientation will address the activities, safe work procedures, air monitoring, PPE, and emergency response procedures required for the tasks performed on-site.

(Note: Truck drivers who are engaged in hauling direct load excavated soil for off-site disposal will not be subject to the site-specific training requirements this SSHP.)

13.2 On-Site Safety Briefings

Project personnel will be given health and safety briefings by the SSHO. The briefings will include providing specific direction to the work party and, if applicable, any new activity will require the development of an AHA to address hazards and controls. The daily briefing will be used as a forum to train workers involved in the activity. A copy of the on-site safety briefing sheet is included in Appendix H.

13.3 First Aid and CPR

The closest Emergency Care Facility is Sentara Virginia Beach General Hospital. Two on-site persons currently qualified/certified in first aid and CPR will be assigned to the site. The training will be consistent with the requirements of the American Red Cross Association and OSHA 29 CFR 1910.1030.

13.4 Hazard Communication

Hazard communication training will be provided and documented. This training will be included, at a minimum, during the initial site safety training/orientation. Lead awareness training is required for this project. A short power point presentation is used for this purpose.

13.5 Site Safety and Health Officer Training

The SSHO shall maintain competency through 24 hours of formal safety and health related coursework every 4 years.

13.6 Annual 8-Hour OSHA Refresher Training

Annual 8-hour OSHA HAZWOPER refresher training will be required of all hazardous waste site field personnel in order for them to maintain their OSHA HAZWOPER qualifications for field work. The training will cover a review of 29 CFR 1910.120 requirements and related company programs and procedures.

(Note: Truck drivers who haul direct load excavated soil for off-site disposal will not be subject to the 29 CFR 1910.120 training requirements of the SSHP.)

13.7 Supervisory Training

Personnel acting in a supervisory capacity shall have received 8 hours of instruction in addition to the initial 40-hour OSHA HAZWOPER training.

13.8 Lead Awareness Training

29 CFR 1926.62(l) requires that all employees receive specific training for work with lead contaminated soil and other materials. SES-TECH has a PowerPoint presentation that covers all the material as required by the regulation. Prior to beginning any work on the project, all workers must receive this training. The training session will be documented in the employees training records.

14.0 LOGS, REPORTS, AND RECORD KEEPING

The following is a summary of required health and safety logs, reports and record keeping.

14.1 Field Change Request

The FCR form, Appendix A of this SSHP, is to be completed for initiating any change to this plan. The PESM and PM or designee approval is required. The original will be kept in the project file. Approved changes will be reviewed with affected field personnel at a safety briefing. Copies will be distributed to the client representative.

14.2 Medical and Training Records

Verification of required training (40-hour, 8-hour, supervisor, site-specific training, and medical clearance for hazardous waste work) will be maintained on-site. All employee medical records will be maintained by the Corporate Medical Consultant – WorkCare.

14.3 Exposure Records

All air monitoring results will be maintained by the SSHO. At the end of the project, exposure records will be maintained according to 29 CFR 1910.1020 requirements.

14.4 Accident/Incident Reports

Incident reporting and investigation will follow SES-TECH corporate procedure EHS 1-7 (Attachment C of the APP).

14.5 OSHA Form 300

An OSHA 300 Form is maintained by SES-TECH. All OSHA recordable injuries or illnesses will be recorded on this form. At the end of the project, the original will be sent to the PESM for maintenance.

14.6 Health and Safety Logbooks

The SSHO will maintain logbooks during site work. The daily site conditions, air monitoring results, and significant events will be recorded. The original logbooks will become part of the employee exposure records file. (Health and Safety Guideline 2-2, Logbooks, found in the CRL, will be followed.)

14.7 Hazard Communication Program/MSDS

The hazard communication program will be maintained on-site. Training on program information and requirements will be provided in accordance with 29 CFR 1910.120 and 1926.59; hazard communication will be provided in accordance with 29 CFR 1910.1200; and retention of DOT markings, placards, and labels will be in accordance with 49 CFR 272.

MSDSs will be obtained for substances brought onto the site. An MSDS file will be kept on-site at the SZ and/or in the site vehicles. All chemical containers shall be properly labeled in accordance with the requirements of the applicable standards. MSDSs will become part of the project permanent file.

14.8 EHS Inspections

The SSHO will perform weekly EHS inspections to assess site conditions and verify compliance with SSHP. The PM or designee will perform inspections at their discretion. The inspection report forms are included as Appendix I.

15.0 FIELD PERSONNEL REVIEW

The Field Personnel Review Form (on the following page) serves as documentation that field personnel have read, or have been informed of, and understand the provisions of this SSHP. It is maintained on-site by the SSHO as a project record. Each person shall sign this form after site-specific training/orientation is completed.

16.0 REFERENCES

CH2M HILL, 2010. Technical Memorandum Work Plan: Oceana Salvage Yard Access Road.

Confirmation Sampling, Naval Air Station Oceana, Virginia Beach, Virginia. September.

United States Environmental Protection Agency (USEPA). 2007. Consent Order.

American Conference of Governmental Industrial Hygienists, Inc., 2011, “Threshold limit values for chemical substances and physical agents in the work environment and biological exposure indices;” American Conference of Governmental Industrial Hygienists (ACGIH), Cincinnati, Ohio.

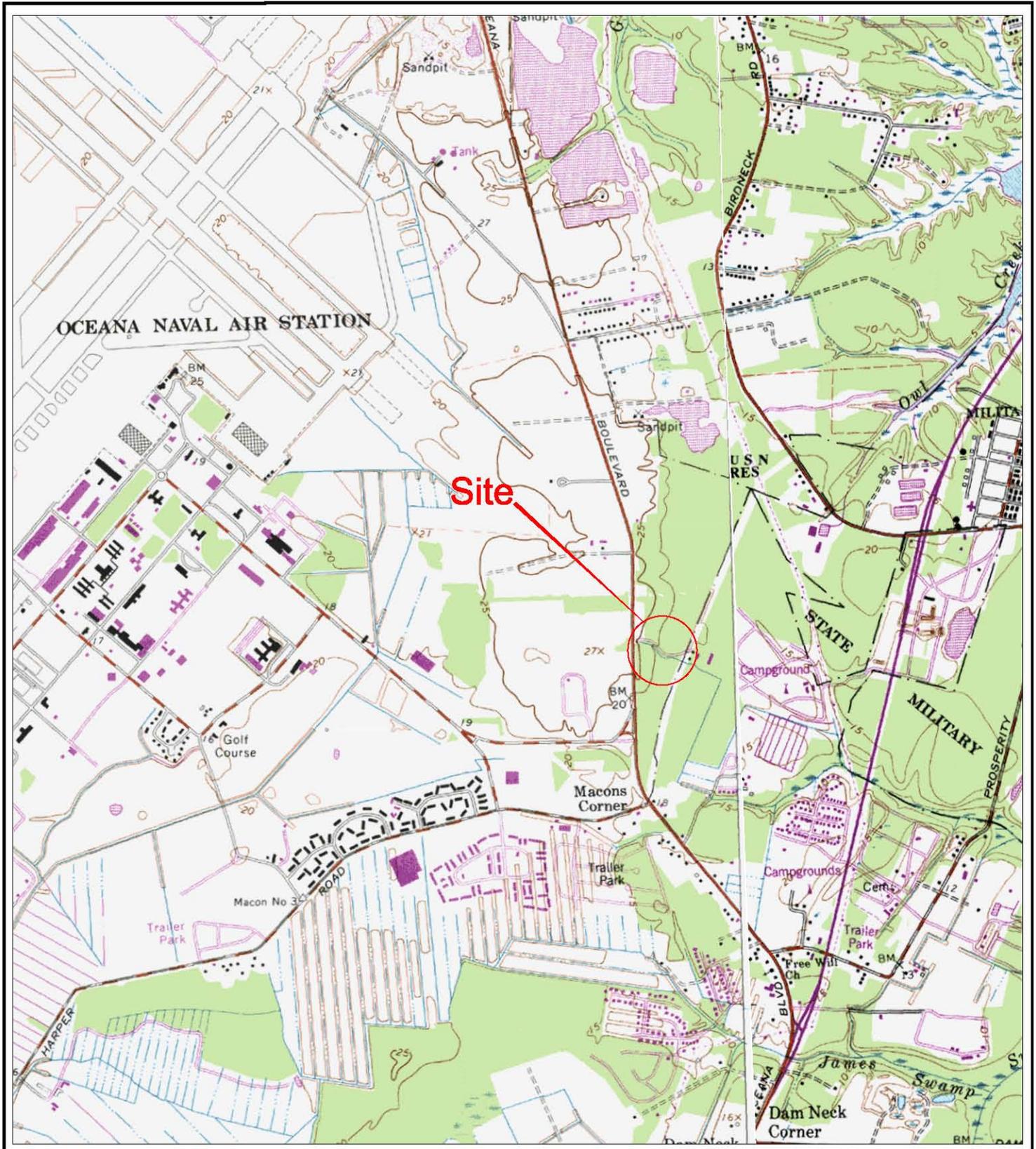
U.S. Department of Labor, Occupational Safety & Health Administration, 29 CFR 1910 - General Industry.

Tetra Tech EC, Inc., Tetra Tech EC Corporate Health and Safety Program.

U.S. Army Corps of Engineers, 2008, Safety and Health Requirements Manual; EM 385-1-1.

FIGURES

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0 2000 4000 Feet



Source: U.S.G.S. Topographic Maps (7.5 Minute)
Princess Anne & Virginia Beach, VA Quadrangles

<p>NAVFAC MID-ATLANTIC Hampton Roads RAO LTM EMAC</p>
<p>NAS Oceana, Virginia Beach, VA Oceana Salvage Access Road Removal Action & Asphalt Cap</p>
<p>Figure 1 Site Location Map</p>
<p>SES-TECH Atlantic</p>

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APPENDIX A
FIELD CHANGE REQUEST FORM

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FIELD CHANGE REQUEST

Project:	Contract No.:	Field Change No.:
----------	---------------	-------------------

To:	Dept.:	Location:	Date:
Re: <input type="checkbox"/> Drawing No.:	Rev No.:	Title:	
<input type="checkbox"/> Spec No.:	Rev No.:	Title:	
<input type="checkbox"/> Other:			

1. Description (Items involved; submit sketch if applicable):			
2. Reason for change (If from disposition of nonconformance report, list report number):			
3. Recommended Disposition: <input type="checkbox"/> Minor Change <input type="checkbox"/> Major Change Describe details:			
4. Resident Engineer (Signature):	Date:	Project Supt. Concurrence (Signature):	Date:
5. Disposition: <input type="checkbox"/> Not Approved—Give reason: <input type="checkbox"/> Considered Minor Change—Approval per recommended disposition; design documents will normally not be revised; field to maintain as-built records <input type="checkbox"/> Considered Major Change—Action will be taken as prescribed on DCN			
Lead Disc. Engr/Designee (Signature)	Date:	Project Engr/Designee (Signature)	Date:

Project Engineer signs and returns to Lead Discipline Engineer for transmittal to Resident Engineer with copies to:	
<input type="checkbox"/> Project Manager	(Name):
<input type="checkbox"/> SSHO	(Name):
<input type="checkbox"/> Project Files	(Location):
<input type="checkbox"/> Others	(Name):

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APPENDIX B
ACTIVITY HAZARD ANALYSES

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Activity Hazard Analysis (AHA) #1

Job/Task: Mobilization, including site preparation and Installation of Erosion Control	Overall Risk Assessment Code (RAC) (Use highest code)	M				
Project Location: Virginia Beach, Virginia	Risk Assessment Code (RAC) Matrix					
Project Name: Oceana Salvage Road						
Contract Number: N40085-11-D-0043	Severity	Probability				
Date Prepared: Revision Date February 2, 2012		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name/Title): Ed Casey, Safety and Health Officer	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, Program CIH	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L
Notes: (Field Notes, Review Comments, etc.) In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP/SSHP. TtEC Corporate Safety Programs and the EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.	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 is 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 is 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 the AHA. Annotate the overall highest RAC at the top of the AHA.				H = High Risk	
					M = Moderate Risk	
				L = Low Risk		

AHA #1– Job/Task: Mobilization, including Site Preparation and Installation of Erosion Control			
Job Steps	Hazards	Controls	RAC
1. Identify driver requirements prior to trailer delivery.	Lack of tractor/trailer inspections could lead to citations or tickets.	Ensure that driver has a current commercial driver's license.	L
2. Locate utilities.	Contact with above- and belowground utilities could cause injury or property damage.	Make sure all above- and below ground utilities have been identified per the Geophysical and Geographical Survey AHA #2.	M

AHA #1– Job/Task: Mobilization, including Site Preparation and Installation of Erosion Control			
Job Steps	Hazards	Controls	RAC
3. Stage truck and heavy equipment at selected sites.	Location could create a traffic hazard.	Locate staging area, Equipment Storage, and Support Zone in an area that will not obstruct traffic and ensure that flaggers are certified. Follow Oceana Salvage –Traffic Control Plan requirements.	M
4. Set up work areas	Worker exposure to extreme temperatures (Heat exhaustion/ heat stroke).	Monitor for heat stress and implement heat stress prevention in accordance with EHS Procedure 4-6, Temperature Extremes. Provide fluids and rest breaks during warm weather, and while wearing impermeable protective clothing.	M
	Eye injury.	Safety glasses (clear or tinted) are the minimum required eye protection for all work areas.	L
	Lack of communication in widely dispersed areas could lead to a delayed response in an emergency.	Ensure that each work team has a phone, or access to a phone, for emergency communication. A work team may substitute a 2-way radio for a phone, if the other radio party has access to a phone. If more than one team at a time is working, ensure that there is communication between the work teams and project management. Use the buddy system.	M
	Workers could be struck by, or against heavy equipment, or by traffic within/ adjacent the work sites.	Wear high-visibility reflective vests at all times while on site. Make eye contact with operators and drivers Understand and review posted hand signals. Use traffic barricades, signs, delineators, cones, flags, and backup spotters.	M
	Biological hazards such as snakes, insects, ticks, or spiders could cause poisoning, disease.	If deemed necessary, wear leather gloves and/ or nitrile gloves when working Use insect repellent as necessary. Before donning, drop work gloves on the ground and step across their entire surface to reduce the likelihood of bee, spider, scorpion bites/ stings.	M

AHA #1– Job/Task: Mobilization, including Site Preparation and Installation of Erosion Control			
Job Steps	Hazards	Controls	RAC
5. Installation of orange/site zone fencing, silt fencing, stockpile cover, signage, eyewash station structure, etc.	Injury from improper use of power and hand tools.	Inspect all tools for damage before each use, including electrical cords/ pneumatic hoses. Ensure double insulation on electrical tools. Train personnel in the proper use of hand tools. GFCI required for all connections to outdoor use of power tool and other electrical equipment insulation.	M
	Workers could be cut by the metal edges of signs, by the wires used to attach the signs, or by wires on the fence.	Wear leather work gloves.	L
	Electrocution during the operation of a generator lacking GFCI outlets, or use of a GFCI generator in conjunction with: Ungrounded (2 wire) extension cord or worn insulators around hot wire of cord. Non-double-insulated power tools. The generator itself lacks a GFCI outlet.	Only qualified electricians are allowed to hook up or disconnect electrical circuits. Follow lock-out/tag-out protocols. Inspect all extension cords daily for structural integrity, ground continuity, and frayed ends/ worn insulation. The extension cord must be rated for hard usage or extra hard usage (Table 400-4, NEC). Inspect the extension cord connection. Use GFCIs on all outdoor 115- to 120-volt, 20-ampere, or less, circuits. Elevate, or cover, any electric wire or flexible cord passing through the work area to protect it from damage by foot traffic, vehicles, sharp corners, projections, or pinching, such as doorways, windows (cover only in accordance with NEC requirements). Keep plugs and receptacles out of water unless they are of the approved, submersible type. Ground all electrical circuits in accordance with the NEC, or other applicable standards and regulations. If a generator is used, make sure that it is a type that does not require grounding to the earth by rod. If it requires grounding, follow manufacturer's directions. NEC 250-6 lists the exceptions for grounding portable and vehicle-mounted generators.	M

AHA #1– Job/Task: Mobilization, including Site Preparation and Installation of Erosion Control			
Job Steps	Hazards	Controls	RAC
(con't) 5. Installation of orange/site zone fencing, silt fencing, stockpile cover, signage, eyewash station structure, etc.	Worker strain from manually moving materials and equipment.	Direct personnel to use proper lifting techniques during the first tailgate meeting. Encourage the use of lifting equipment and use of a hand-truck whenever possible. Employees will not lift more than 50 pounds alone. Encourage a steady, sustainable work pace.	M
6. Place plastic liner and geotextile fabric liner for stockpile and decon areas and silt fencing.	Roll of material could fall and injure workers. Roll could roll on to worker.	Keep hands clear of sharp objects and pinch points. Pinch points include the hand or feet between the roll and the ground. Never work in front of a roll.....Always work from a side.	M
	Workers could cut themselves while cutting fencing or liner material.	Always cut away from the body. Wear leather work gloves when working with the knife. Always shield the knife after use. NEVER place the knife in any pocket on the body	M
7. Place a layer of coarse soil or small rock and slope so that all runoff is collected in sump or silt fencing is anchored in ground.	Heavy equipment may strike and injure nearby workers	Wear high-visibility reflective vests when exposed to vehicular traffic. Make eye contact with operators before approaching equipment. Understand and review posted hand signals.	M
8. Place sandbags to berm the silt fencing and liner as needed.	Strains from manually moving materials and equipment.	Personnel shall be directed to use proper lifting techniques such as keeping the back straight, lifting with the legs, limiting twisting, and getting help in moving bulky/heavy materials and equipment. Use of hand truck shall be encouraged. Employees will not lift more than 50 pounds. Sandbags will not exceed 35 pounds wet. Sandbags will not be heaved or tossed (places additional strain on back).	M

AHA #1- Job/Task: Mobilization, including Site Preparation and Installation of Erosion Control		
Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements
1. Site vehicles	<p>Drivers must have current state-issued driver's license.</p> <p>Trained and authorized personnel will operate off-road vehicles.</p> <p>Qualified operators will be identified upon assignment.</p>	<p>Receipt inspection by Equipment Supervisor and SSHO.</p> <p>A copy of the certification by the mechanic that the vehicles meet EM 385-1-1 requirements must be provided.</p> <p>Daily vehicle inspection by drivers.</p>
2. Heavy equipment, power and hand tools	<p>Qualified operators will be identified upon assignment. Only trained equipment operators may operate heavy equipment; Only Department of Motor Vehicles-licensed personnel will operate trucks.</p> <p>Specific training for power tools, hand tools, and electrical safety is required.</p>	<p>Inspect daily, and before use.</p> <p>Use the form provided in the SSHP.</p> <p>All heavy equipment must be inspected by the supervisor and the SSHO upon arrival at the site.</p> <p>A copy of the certification by the mechanic that the equipment meets EM 385-1-1 requirements must be provided.</p>
3. Hand and power tools	<p>Training in use of hand and power tools is required. Use proper hand tool for the task.</p>	<p>Daily inspection by users/operators.</p>
4. Fire extinguishers	<p>Fire extinguisher training including use/limitations.</p>	<p>At least monthly by SSHO or designee.</p>
5. First aid kits and other emergency equipment	<p>Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.</p>	<p>Initially and at least weekly thereafter or after use for restocking (29 CFR 1926.50[d][2]). First aid kits must be filled per EM 385-1-1 Table 3-1, (8 CCR 5812).</p>
6. Generator, if used	<p>Only trained personnel may operate generator. Only qualified electricians may work on electrical components of the system.</p>	<p>Daily and before use.</p> <p>Use inspection checklist provided by manufacturer.</p> <p>Operator's manual must be on-site.</p>

AHA #1- Job/Task: Mobilization, including Site Preparation and Installation of Erosion Control

Abbreviations and Acronyms:

AHA – Activity Hazard Analysis

APP – Accident Prevention Plan

CFR – Code of Federal Regulations

CIH – Certified Industrial Hygienist

CSP – Certified Safety Professional

EHS – Environmental Health and Safety

EM – Engineer Manual

GFCI – ground fault circuit interrupter

NEC – National Electrical Code

RAC – Risk Assessment Code

SSHO – Site Safety and Health Officer

SSHP – Site Safety and Health Plan

TtEC – Tetra Tech EC, Inc.

Activity Hazard Analysis (AHA) #2

Job/Task: Geophysical and Geographical Surveys	Overall Risk Assessment Code (RAC) (Use highest code)	M				
Project Location: Virginia Beach, Virginia	Risk Assessment Code (RAC) Matrix					
Project Name: Oceana Salvage Road						
Contract Number: N40085-11-D-0043	Severity	Probability				
Date Prepared: Revision Date February 2, 2012		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name/Title): Ed Casey, Safety and Health Officer	Catastrophic	E	E	H	H	M
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, Program CIH	Critical	E	H	H	M	L
	Marginal	H	M	M	L	L
Notes: (Field Notes, Review Comments, etc.) In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP/SSHP. TtEC Corporate Safety Programs and the EM 385-1-1 will also be available on site for review of specific materials and mitigation measures.	Negligible	M	L	L	L	L
	Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above)					
<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			
AHA #2 - Job/Task: Geophysical and Geographical Surveys						
Job Steps	Hazards	Controls				RAC
1) Dig Alert notification	Gas utility explosion, electrocution, wet utility rupture, fiber optic/ data/ phone line damage.	<p>Ensure that all utilities (identified by Dig Safe/Alert (811) prior to the start of field work) are marked (or declared absent by individual utility companies) across the area of the Oceana Salvage Road Excavation Cells.</p> <p>Identify all markings painted by the geophysical surveyor as well.</p> <p>Mark the Excavation Cell a distance of 10 feet or greater from all marked/ potential utility locations.</p> <p>Review base drawings and Base-Engineering Department as-built drawings. Visibly inspect areas for other potential existing utilities.</p> <p>Use a spotter to back up Site Vehicles</p>				L

AHA #2 - Job/Task: Geophysical and Geographical Surveys			
Job Steps	Hazards	Controls	RAC
2) Conduct a geophysical survey, survey of excavation and sample locations	Slips, trips, and falls.	<p>Visually inspect work areas and mark, barricade, or eliminate slip, trip, and fall hazards, if feasible.</p> <p>Use care in the work area; look for depressions and obstructions.</p> <p>Allow employees to work only on walking/working surfaces that have the strength and integrity to support employees safely.</p> <p>Look for burrows/ squirrel holes.</p> <p>Cover and mark openings 18 inches or more in diameter.</p>	M
	Struck by vehicles traffic.	<p>Wear high-visibility reflective vests.</p> <p>Post an observer, as needed, when a surveyor is using instruments (a surveyor is often focused on the task and may not be aware of nearby traffic).</p> <p>Use traffic control or barricades, if necessary, to keep traffic away from workers.</p>	L
	Exposure to spray paint and propellant while marking underground utilities and anomalies.	<p>Follow manufacturers' instructions on the use of paint.</p> <p>Review the appropriate MSDS.</p> <p>Never point paint nozzles toward another person.</p>	L
	Worker strain from manually moving materials and equipment.	<p>Direct personnel to use proper lifting techniques</p> <p>Encourage the use of mechanical lifting equipment</p> <p>Employees will not lift more than 50 pounds alone.</p> <p>Encourage a steady, sustainable work pace.</p>	M
	Workers could be struck by, or against heavy equipment, or by traffic within/ adjacent the work sites.	<p>Wear high-visibility reflective vests at all times while on site. Make eye contact with operators and drivers</p> <p>Understand and review posted hand signals.</p> <p>Use traffic barricades, signs, delineators, cones, flags, and backup spotters.</p>	M
	Biological hazards such as snakes, insects, ticks, or spiders could cause poisoning, disease.	<p>If deemed necessary, wear leather gloves and/ or nitrile gloves when working</p> <p>Use insect repellent as necessary.</p> <p>Before donning, drop work gloves on the ground and step across their entire surface to reduce the likelihood of bee, spider bites/ stings.</p>	L

AHA #2 - Job/Task: Geophysical and Geographical Surveys			
Job Steps	Hazards	Controls	RAC
(con't) 2) Conduct a geophysical survey, survey of excavation and sample locations	Worker exposure to extreme temperatures (Heat exhaustion/ heat stroke).	Monitor for heat stress and implement heat stress prevention in accordance with EHS Procedure 4-6, Temperature Extremes. Provide fluids and rest breaks during warm weather, and while wearing impermeable protective clothing.	L
	Worker exposure to extreme temperatures (Cold Stress)	Monitor for cold stress and implement prevention in accordance with EHS Procedure 4-6, Temperature Extremes.	L
	Eye injury	Safety glasses (clear or tinted) are the minimum required eye protection for all work areas.	L

AHA #2 - Job/Task: Geophysical and Geographical Surveys		
Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Site Vehicles	<p>Drivers must have current State-issued driver's license.</p> <p>Trained and authorized personnel will operate off road vehicles.</p> <p>Qualified operators will be identified upon assignment.</p>	<p>Receipt inspection by Equipment Supervisor.</p> <p>Daily vehicle inspection by drivers.</p> <p>Only Department of Motor Vehicles-licensed personnel will operate vehicles.</p>
Hand and power tools, geophysical instruments, survey instruments	<p>Training in use of hand and power tools by the SSHO or designee and review of operating manual.</p> <p>Use proper hand tool for the task.</p>	<p>Daily inspection by users/operators.</p>
First aid kits and other emergency equipment	<p>Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, by or under direction of the SSHO.</p>	<p>Initially and at least weekly thereafter or after use for restocking. (29 CFR 1926.50(d)(2))</p> <p>First aid kits must be filled per EM 385-1-1</p>
Fire Extinguishers	<p>Fire Extinguisher Training including use/limitations.</p>	<p>At least monthly by SSHO or designee.</p>

Acronyms:

- AHA – Activity Hazard Analysis
- APP- Accident Prevention Plan
- CFR – Code of Federal regulations
- CIH – Certified Industrial Hygienist
- CSP – Certified Safety Professional
- EM – Engineer Manual
- EHS – Environmental Health and Safety
- MSDS – Material Safety Data Sheet
- RAC – Risk Assessment Code
- SSHO – Site Safety and Health Officer
- SSHP – Site Safety and Health Plan
- TtEC-Tetra Tech EC, Inc.

Activity Hazard Analysis (AHA) #3

Job/Task: Clearing and Grubbing	Overall Risk Assessment Code (RAC) (Use highest code)					M
Project Location: Virginia Beach, Virginia	Risk Assessment Code (RAC) Matrix					
Project Name: Oceana Salvage Road	Severity	Probability				
Contract Number: N40085-11-D-0043		Frequent	Likely	Occasional	Seldom	Unlikely
Date Prepared: Revision Date February 2, 2012	Catastrophic	E	E	H	H	M
Prepared by (Name/Title): Ed Casey, Safety and Health Officer	Critical	E	H	H	M	L
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, Program CIH	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L
<p>Notes: (Field Notes, Review Comments, etc.)</p> <p>In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP/SSHP. TTEC Corporate Safety Programs and the EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.</p>	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 is 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 is 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 the AHA. Annotate the overall highest RAC at the top of the AHA.				H = High Risk	
					M = Moderate Risk	
L = Low Risk						

AHA #3– Job/Task: Clearing and Grubbing			
Job Steps	Hazards	Controls	RAC
1. Use heavy equipment to access or remove shrubs, trees, and debris.	Workers could be struck by or against heavy equipment.	Wear high-visibility reflective vests when exposed to vehicle traffic. Make eye contact with operators before approaching equipment. Understand and review posted hand signals. Use signs, flags, and backup spotters.	M
	Workers may fall from aerial lift.	If using an aerial lift to access trees, assure operator is trained in the use of the lift. Do not climb on or outside of basket railings. Use fall protection devices such as full body harness and lanyard attached to designated anchor point inside lift, if required for the type of lift used. Ensure lift is positioned on stable, even surface before extending.	
	Aerial lift might contact overhead utilities.	Maintain clearance from utilities, minimum 15 feet from power lines.	

AHA #3– Job/Task: Clearing and Grubbing			
Job Steps	Hazards	Controls	RAC
(con't) 1. Use heavy equipment to access or remove shrubs, trees, and debris.	Workers struck by falling shrubs, trees, or debris.	Stand away from objects as they are being uprooted or removed. Barricade area where limbs/branches will fall to prevent inadvertent entry.	
	Exposure to poisonous plants could cause skin rashes.	Wear long sleeves or protective coveralls. Be aware of the characteristics of poison oak (3 leaves, in fall, reddish in color). Avoid contact with poison oak. Although clothing may initially protect, contaminated clothing when handled could still expose the worker. Always wash hands thoroughly after working in areas with poison oak. Use protecting creams.	
2. Load and haul materials	Failure to follow waste management plan could cause waste to be rejected by disposal facility. Waste could fall off truck and strike traffic. Waste could start on fire.	Be sure materials are secured to vehicle transporting them. Cover so that materials do not fall off truck. If materials are consolidated into a truck for hauling to a disposal site, ensure that all material is compatible and acceptable for the disposal site. Do not mix chemical wastes with debris or containers containing any materials (dispose of these separately as required by the waste management plan). When handling vegetation use leather gloves.	L
	Noise could cause hearing loss.	Hearing protection is required when sound levels continuously exceed 84 dBA. Usually this will only apply to workers working in unenclosed cabs of heavy equipment or ground workers working near heavy equipment.	
3. Remove trees/shrubs root system and other underground debris.	Underground utilities	Physically verify the location and depth of existing utilities prior to starting excavation through geophysical and utility survey. Call National One Call, 811, prior to any disturbance of the ground. Scan the excavation area with electromagnetic and sonic equipment and mark ground where existing underground utilities are discovered. Protect all existing utilities during excavation. Perform excavation within 4 feet of existing utilities by hand and/or nonaggressive methods per EHS 3-15, Underground Utilities. Protect all underground utilities as soil is removed around or under the utility line.	M
	Potential underground gas pockets could be explosive.	Note any abnormal odors indicating the presence of gases. STOP WORK! Use combustible gas meter to determine if gases are flammable. If the LEL is at 10% or greater, do not continue. Contact PM and PESM.	
	Sharp objects and debris could cause cut or puncture injuries to workers.	Handle debris with leather, cut/puncture-resistant gloves.	
	Strains from manually moving materials, shrubs, trees, and debris could injure workers.	Personnel shall be directed to use proper lifting techniques such as keeping the back straight, lifting with the legs, limiting twisting, and getting help in moving bulky/heavy materials and equipment.	

AHA #3– Job/Task: Clearing and Grubbing			
Job Steps	Hazards	Controls	RAC
(Con't) 3. Remove trees/shrubs root system and other underground debris.		Use mechanical assistance whenever possible. Employees will not lift more than 50 pounds alone. Objects that are bulky with unevenly distributed weight or objects heavier than 50 pounds require more than one person. If material is lifted using chains, slings, or wire ropes, these devices must be inspected and rated for the weight of the load being lifted regardless of the height the material is raised. Follow safe rigging techniques.	
	Exposure to insects, snakes, animals could cause stings, poisoning, or disease.	Be aware that snakes often can take shelter near objects that are on the ground. Poke around or prod before moving the object with your hands. Bees, hornets, and wasps often nest in various objects as well as in shrubs and trees. Before disturbing object or area, check for insects.	
	Potential exposure to chemical hazards and dust.	Perform air monitoring as specified in the SSHP. Wear required PPE. Minimize generation of dust. Use dust control measures.	
4. Use power and hand tools	Strains could result from use of tools, such as shovels, axes, chain saws, and brush trimmers. Workers could cut themselves using tools.	Maintain steady pace when using tools and take adequate rest periods. Use appropriate tools for the task and maintain tools in good condition. Wear leather work gloves when using tools. Avoid working too close to other workers. Wear full denim or heavy pants when using trimmers.	M
	Noise from power equipment – chain saws, weed cutters, vehicles could cause hearing loss to workers.	Hearing protection is required when sound levels continuously exceed 84 dBA.	
	Struck by or against chain saw.	Follow safe work practices. Wear cutting chaps. Assure that saw interlock is operable. The saw must automatically shut off when the trigger is released. Wear required safety gear – hard hat, steel toe boots, safety glasses, and hearing protection. Only trained personnel will operate saw. At no time will saw be used at a level higher than the chest level of the operator.	
	Workers could be struck by flying debris from chain saws or brush trimmer.	Stand as far away as possible from other workers in the same area. Wear PPE. Avoid actions that cause debris to fly higher or further.	
	Loading trucks	Prohibit truck drivers from standing near trucks as they are being loaded. Prohibit truck drivers from sitting in the cab of trucks as they are being loaded, unless the truck is equipped with a cab protector (Falling Object Protective System [FOPS]).	
5. Fuel handling	Handling of fuel for chain saws, vehicles, and brush trimmer may expose workers to fuel.	Review MSDS for fuel with all workers. Workers will be instructed on fuel transfer procedures. Wear protective nitrile gloves when handling fuel.	L

AHA #3– Job/Task: Clearing and Grubbing			
Job Steps	Hazards	Controls	RAC
(con't) 5. Fuel handling	Spills can cause environmental damage.	Use procedures that prevent fuel from spilling. Fuel only in a designated area that has spill protection and control. Have spill control material available and clean up all spills immediately.	
6. Use of mowing equipment	Refueling may cause spills or fire.	Refuel lawn mowers or other equipment only in a designated area. Do not refuel any equipment that is located on a pickup truck or trailer. Refuel equipment on a level surface such as concrete. Clean up all spills immediately using readily available spill control materials. Report any spills. Do not refuel hot equipment. Allow the engine to cool. Smoking is never allowed during any fueling operation. Wear PPE and chemical protective gloves, such as nitrile gloves.	M
	Operation may cause debris to fly out from mower.	Wear proper PPE, especially safety glasses and hearing protection (most cutting equipment produces noise of at least 92 dBA). When using weed trimmers, wear leg protection or wear heavy fabric pants such as denim or canvas. Perform a foreign object and debris check prior to using any mowing or lawn cutting equipment. Ensure that other people are not within the vicinity of cutting equipment. Other people must maintain a safe clearance distance. Inspect all equipment before use, especially any cutting blades and the attachments.	
	Mower may tip while being operated, causing injury to workers.	Never ride a mower along the horizontal plane of a steep slope. Ride perpendicular to the grade when riding a mower up or downhill. Operate mower at a safe speed. Watch for pits, depressions, large rocks, and any other object that could destabilize the mower.	

AHA #3– Job/Task: Clearing and Grubbing		
Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Hand tools, power tools, site vehicles, heavy equipment, and lawn mowers.	<p>Only trained equipment operators may operate heavy equipment; only DMV-licensed personnel will operate trucks. Specific training on the use of lawn mowers, brush trimmers, chain saws and other cutting equipment is required. Specific training is required on rigging if chains, wire ropes, or slings are used to lift trees and other objects. Qualified person for rigging and lifting must be designated by PM or Superintendent. Specific training is required for the operation of aerial lifts.</p>	Inspect daily, and before use.

Abbreviations and Acronyms:

- AHA – Activity Hazard Analysis
- APP – Accident Prevention Plan
- CIH – Certified Industrial Hygienist
- CSP – Certified Safety Professional
- CTO – Contract Task Order
- dBA – decibels, A-scale
- DMV – Department of Motor Vehicles
- EHS – Environmental Health and Safety
- LEL – lower explosive level
- MSDS – material safety data sheet
- PESM – Project Environmental Safety Manager
- PM – Project Manager
- PPE – personal protective equipment
- RAC – Risk Assessment Code
- SSHO – Site Safety and Health Officer
- SSHP - Site Safety and Health Plan

Activity Hazard Analysis (AHA) #4

Job/Task: In-Situ Treatment, Soil Excavation and Soil Management (including Truck Loading and Waste Management)	Overall Risk Assessment Code (RAC) (Use highest code)	M				
Project Location: Virginia Beach, Virginia	Risk Assessment Code (RAC) Matrix					
Project Name: Oceana Salvage Road						
Contract Number: N40085-11-D-0043	Severity	Probability				
Date Prepared: Revision Date February 2, 2012		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name/Title): Ed Casey, Safety and Health Officer	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, Program CIH	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L
Notes: (Field Notes, Review Comments, etc.) This AHA is an addendum to the APP/SSHP to address additional work described in the additional work plan section 4.5.13.8 In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP/SSHP. TtEC Corporate Safety Programs and the EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.	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 is 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 is 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 the AHA. Annotate the overall highest RAC at the top of the AHA.				H = High Risk	
				M = Moderate Risk		
				L = Low Risk		
AHA #4– Job/Task: In-situ Treatment, Soil Excavation and Soil Management (including Truck Loading and Waste Management)						
Job Steps	Hazards	Controls				RAC
1) In-Situ Treatment, Excavate Soil and Load out into Trucks and Work around excavator and soil trucks.	Workers could be struck by or against heavy equipment or trucks.	Establish and follow a traffic control plan. Wear reflective high-visibility vests. Avoid equipment swing areas and designated traffic routes. Make eye contact with operators before approaching equipment or trucks. Understand and review posted hand signals. Use spotters and flaggers, as necessary, to direct trucks, as well as any nearby traffic. Ground workers need to stand a safe distance from the excavator, (especially the counterweight). Maintain eye contact with operator. Be aware of the swing radius of the excavator.				M

AHA #4– Job/Task: In-situ Treatment, Soil Excavation and Soil Management (including Truck Loading and Waste Management)

Job Steps	Hazards	Controls	RAC
(con't) 1) In-Situ Treatment, Excavate Soil and Load out into Trucks and Work around excavator and soil trucks.	Workers could be exposed to contaminated soils. Drivers could fall while trapping trucks.	Establish Exclusion Zone and Contamination Reduction Zone. Use a staggered approach to CRZ and EZ if necessary. Wear PPE specified in SSHP: Disposable coveralls, boots with boot covers (or steel-toe PVC boots), nitrile or latex gloves, safety glasses and hard hat. Avoid stirring up dust when moving in and around the excavation. Control dust generation with light water mist. If dust is visible, work must stop and workers must wear a full face respirator with P-100 cartridges. The disposable coveralls must be changed to coveralls with an attached hood. Continuously spray with a light mist of water while excavating soil to reduce visible dust. Stop operations when winds exceed 25 mph or less if dust emissions cannot be controlled. Discard outer PPE as specified in the SSHP following decontamination procedures. Place used PPE in a separate, properly labeled, container Decontaminate trucks & truck tires before they enter a paved road. Tarp or load truck in such a manner to prevent visible dust during loading. Also use a water spray mist to suppress visible dust. Workers will not climb trucks to tarp the truck. Use automatic trapping devices.	M
	Workers could get hands, feet or the body caught between equipment and the other objects or the ground.	Provide spotters for backing in trucks/ placement of loads. Ground workers will maintain safe distance from dumping truck and loaders. Dump trucks will maintain a safe distance from excavation edges when dumping. Never position arms, hands, feet between moving and stationary parts. Never use arms, hand or feet to remove stuck material in gates, doors, etc. Never place body or head into the body of a dump truck.	M
	Back Injury	Do not lift more than 50 pounds at a time (alone) Use Team Lifting Techniques Use mechanical means to lift load.	M
	Drivers of trucks could be injured by loads as they are being placed in trucks.	Prohibit truck drivers from standing near trucks as they are being loaded. Prohibit truck drivers from sitting in the cab of trucks as they are being loaded, unless the truck is equipped with a cab protector (FOPS)	M
	Noise from operating equipment.	Wear hearing protection when working on the ground in the vicinity of the excavator.	M

AHA #4– Job/Task: In-situ Treatment, Soil Excavation and Soil Management (including Truck Loading and Waste Management)

Job Steps	Hazards	Controls	RAC
(con't) 1) In-Situ Treatment, Excavate Soil and Load out into Trucks and Work around excavator and soil trucks.	<u>Contact with Ecobond® Pb</u>	Refer to the MSDS for additional information in Appendix D of the SSHP. Avoid getting in eyes, wear sealed protective goggles when handling. If eye contact occurs, flush eyes with plenty of water for 30 minutes. Avoid breathing dust, wet down with water mist. If dust is not controlled, use a Full Face Air Purifying respirator. If inhaled, get to fresh air immediately, get prompt medical attention. Avoid contact with skin and clothing, protect open wounds, wear protective coveralls when handling. If skin contact occurs, wash skin with soap and water. If ingested, first aid is not usually required, however get prompt medical attention if adverse reaction occurs. Wash thoroughly after handling. Work Clothes, coveralls (Durafab® or KleenGard®) with attached hood and elastic wrist and ankle bands may be required to cover all exposed skin if dust control is inadequate or material is handled by other than mechanical means.	M
2) Waste Management	Exposure to contaminants	Wear PPE specified in SSHP: Disposable coveralls, boots with boot covers (or steel-toe PVC boots), nitrile or latex gloves, safety glasses and hard hat. Avoid stirring up dust when moving in and around the excavation. Control dust generation with light water mist. If dust is visible, work must stop and workers must wear a full face respirator with P-100 cartridges. The disposable coveralls must be changed to coveralls with an attached hood. Continuously spray with a light mist of water while excavating soil to reduce visible dust.	M
	Employees could be struck by trucks	Provide spotters for backing in trucks/ placement of loads. Ground workers will maintain safe distance from truck and loaders. Ground workers need to stand a safe distance from equipment/trucks. Maintain eye contact with operator/driver.	M
	Back Injury	Do not lift more than 50 pounds at a time (alone). Use Team Lifting Techniques Use mechanical means to lift load.	M
	Drivers of trucks could be injured by site activities	Prohibit truck drivers from exiting truck/standing near trucks. Supervise drivers if they need to leave truck to load wastes.	M
	Noise from operating equipment.	Wear hearing protection when working on the ground in the vicinity of the excavator.	M

AHA #4– Job/Task: In-situ Treatment, Soil Excavation and Soil Management (including Truck Loading and Waste Management)		
Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Excavator, dump trucks, excavator with compactor wheel attachment.	Only qualified persons may operate equipment. Operators' manual must be reviewed and be available on-site. Only DMV-licensed personnel will operate trucks.	Daily and before use. Use inspection checklists. If compactor wheel attachment is used, ensure that the attachment is attached and inspected per the manufacturer's instructions.
Fire extinguishers	Fire extinguisher training including use/limitations.	At least monthly by SSHO or designee.
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking (29 CFR 1926.50[d][2]). First aid kits must be filled per EM 385-1-1 Table 3-1

- Abbreviations and Acronyms:**
 AHA - Activity Hazard Analysis
 APP – Accident Prevention Plan
 CFR – Code of Federal Regulations
 CIH – Certified Industrial Hygienist
 CSP – Certified Safety Professional
 DMV – Department of Motor Vehicles
 EM – Engineer Manual
 PPE – personal protection equipment
 RAC – Risk Assessment Code
 SSHO – Site Safety and Health Officer
 SSHP - Site Safety and Health Plan
 TtEC – Tetra Tech EC, Inc

Activity Hazard Analysis (AHA) #5

Job/Task: Post-Treatment Sampling, Confirmatory Soil Sampling and Barrier Fabric Placement	Overall Risk Assessment Code (RAC) (Use highest code)	M				
Project Location: Oceana NTCRA; Virginia Beach, VA	Risk Assessment Code (RAC) Matrix					
Contract Number: N40085-11-D-0043	Severity	Probability				
Date Prepared: Revision Date February 2, 2012		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name/Title): Lee Dixon, ESQ Regulatory Specialist	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, Program CIH	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L
Notes: (Field Notes, Review Comments, etc.) In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP/SSHP. TtEC Corporate Safety Programs and the EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.	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 is 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 is 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 the AHA. Annotate the overall highest RAC at the top of the AHA.				M = Moderate Risk	
				L = Low Risk		

AHA #5 – Job/Task: Post-Treatment Sampling, Confirmatory Soil Sampling and Barrier Fabric Placement

Job Steps	Hazards	Controls	RAC
1) Collect soil samples.	Entry into excavation could cause workers to fall when climbing in and out of excavation. If excavation is 4 feet or greater in depth workers could be engulfed by unprotected sides of excavation.	Use a ladder to enter and leave excavations. (This is also important for exposure control as noted in the hazard evaluation blow). Do not enter excavations that are 4 feet or greater in depth.	M
	Back Injury	Do not lift more than 50 pounds at a time (unassisted). Use Team Lifting Techniques (no more than 100-pounds maximum). Use mechanical means to lift load.	M

AHA #5 – Job/Task: Post-Treatment Sampling, Confirmatory Soil Sampling and Barrier Fabric Placement			
Job Steps	Hazards	Controls	RAC
(con't) 1) Collect soil samples.	Exposure to contaminants in dust (soil has high levels of lead).	Avoid contact with soil. Use ladder to enter or exit the excavation so hand and body contact with the soil is minimized. Wear PPE specified in SSHP: Disposable coveralls, boots with boot covers (or steel-toe PVC boots), nitrile or latex gloves, safety glasses and hard hat. Avoid stirring up dust when moving in and around the excavation. Control dust generation with light water mist. If dust is visible, work must stop and workers must wear a full face respirator with P-100 cartridges. The disposable coveralls must be changed to coveralls with and attached hood.	M
2) Place orange barrier fabric on bottom of excavation (at 2 ft. bgs).	Workers could fall into excavation.	Workers will not enter the excavation. Workers will stand back from the edge of the excavation while placing the material	M
	Workers could cut themselves when cutting the fabric.	Always cut away from the body. Use a self-retracting blade knife. Never store knife in a pocket or on the body. Lock the blade closed when complete with cutting. Always wear leather gloves when cutting.	M
	Roll of material could fall and injure workers. Roll could roll on to worker.	Keep hands clear of sharp objects and pinch points. Pinch points include the hand or feet between the roll and the ground. Never work in front of a roll, always work from a side.	M
	Exposure to contaminants in dust (soil has high levels of lead).	Avoid contact with soil and generating dust. When placing the fabric lower it slowly (perhaps by using rope attached to the fabric, and then just let the rope drop slowly into the excavation. Wear PPE specified in SSHP: Disposable coveralls, boots with boot covers (or steel-toe PVC boots), nitrile or latex gloves, safety glasses and hard hat. Control dust generation with light water mist. If dust is visible, work must stop and workers must wear a full face respirator with P-100 cartridges. The disposable coveralls must be changed to coveralls with an attached hood.	M

AHA #5 – Job/Task: Post-Treatment Sampling, Confirmatory Soil Sampling and Barrier Fabric Placement		
Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Disposable Sampling Equipment, including hand tools	No decontamination of equipment will be necessary because dedicated, disposable sampling equipment will be used. Training on use of hand tools.	Inspect hand tools for collecting samples.
Utility knife	Personnel using knives must review this AHA and be aware of the hazards of improper use and storage of the knife.	Before each use. Ensure blade retracts fully when not in use and that it can be locked in that position when not in use. Ensure blade is clean and sharp.
Fire extinguishers	Fire extinguisher training including use/limitations.	At least monthly by SSHO or designee.
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking (29 CFR 1926.50[d][2]). First aid kits must be filled per EM 385-1-1 Table 3-1.

Abbreviations and Acronyms:

- AHA - Activity Hazard Analysis
- APP – Accident Prevention Plan
- CFR – Code of Federal Regulations
- CIH – Certified Industrial Hygienist
- CSP – Certified Safety Professional
- EM – Engineer Manual
- PPE – Personal Protection Equipment
- RAC – Risk Assessment Code
- SSHO – Site Safety and Health Officer
- SSHP - Site Safety and Health Plan
- TtEC – Tetra Tech EC, Inc.

Activity Hazard Analysis (AHA) #6

Job/Task: Backfill of Excavation and Regrading	Overall Risk Assessment Code (RAC) (Use highest code)	M				
Project Location: Oceana NTCRA; Virginia Beach, VA	Risk Assessment Code (RAC) Matrix					
Contract Number: N40085-11-D-0043	Severity	Probability				
Date Prepared: Revision Date February 2, 2012		Frequent Likely Occasional Seldom Unlikely				
Prepared by (Name/Title): Lee Dixon, ESQ Regulatory Specialist	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, Program CIH	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L
Notes: (Field Notes, Review Comments, etc.) In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP/SSHP. TtEC Corporate Safety Programs and the EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.	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 is 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 is 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 the AHA. Annotate the overall highest RAC at the top of the AHA.				H = High Risk	
					M = Moderate Risk	
L = Low Risk						

AHA #6 – Job/Task: Backfill of Excavation and Regrading			
Job Steps	Hazards	Controls	RAC
1) Haul clean crushed gravel	Workers could be struck by or against heavy equipment or trucks.	Establish and follow a traffic control plan. Wear reflective high-visibility vests. Avoid equipment swing areas and designated traffic routes. Make eye contact with operators before approaching equipment or trucks. Understand and review posted hand signals. Use spotters and flaggers, as necessary, to direct trucks, as well as any nearby traffic. Ensure proper illumination in all work areas.	M
	Drivers of trucks could be injured by loads as they are being placed in trucks.	Prohibit truck drivers from standing near trucks as they are being loaded. Prohibit truck drivers from sitting in the cab of trucks as they are being loaded, unless the truck is equipped with a cab protector (FOPS).	M
	Dirt and dust can accumulate on roads used for transport of material.	Brush off trucks before they enter a paved road. Tarp or load truck in such a manner to prevent dirt and dust from getting onto paved roads. Workers will not climb trucks to tarp the truck.	M

AHA #6 – Job/Task: Backfill of Excavation and Regrading			
Job Steps	Hazards	Controls	RAC
2) Haul clean soil fill to site	Workers could be struck by or against heavy equipment or trucks.	Establish and follow a traffic control plan. Wear reflective high-visibility vests. Avoid equipment swing areas and designated traffic routes. Make eye contact with operators before approaching equipment or trucks. Understand and review posted hand signals. Use spotters and flaggers, as necessary, to direct trucks, as well as any nearby traffic. Ensure proper illumination in all work areas.	M
	Drivers of trucks could be injured by loads as they are being placed in trucks.	Prohibit truck drivers from standing near trucks as they are being loaded. Prohibit truck drivers from sitting in the cab of trucks as they are being loaded, unless the truck is equipped with a cab protector.	M
3) Dump clean soil load at excavation site.	Workers could be struck by or against heavy equipment or trucks.	Provide spotters for dumping and/or direction of placement of loads. Ground workers will maintain distance from dumping truck and loaders. Dump trucks will maintain a safe distance from excavation edges when dumping. Workers will avoid standing near edges of excavations.	M
	Workers could get hands, feet or the body caught between equipment and the other objects or the ground.	Never position arms, hands, feet between moving and stationary parts. Never use arms, hand or feet to remove stuck material in gates, doors, etc. Never place body or head into the dump of a dump truck.	M
	Workers exposed to contaminants in dust (soil has high lead content) during unloading process.	Wear PPE specified in SSHP: Disposable coveralls, boots with boot covers (or steel-toe PVC boots), nitrile or latex gloves, safety glasses and hard hat. Avoid stirring up dust when moving in and around the excavation. Control dust generation with light water mist. If dust is visible, work must stop and workers must wear a full face respirator with P-100 cartridges. The disposable coveralls must be changed to coveralls with and attached hood.	M
4) Grade clean overburden and compact remainder of excavation	Workers could be struck by or against heavy equipment or trucks.	Provide spotters for dumping and/or direction of placement of loads. Ground workers will maintain distance from dumping truck and loaders. Dump trucks will maintain a safe distance from excavation edges when dumping. Workers will avoid standing near edges of excavations.	M
	Workers exposed to dust during compaction process.	Use fine mist of water to suppress dust.	M
	Noise from operating equipment	Wear hearing protection when working on the ground in the vicinity of the excavator,	L
5) Compact using excavator bucket or dozer.	Vehicle could tip over near the edge of the excavation.	Follow manufacturer's directions for safe operation. Operate equipment only in accordance with manufacturer's specifications. Operate equipment at least 2-feet from the edge of the excavation. Wear seat belts in all equipment at all times.	M

AHA #6 – Job/Task: Backfill of Excavation and Regrading			
Job Steps	Hazards	Controls	RAC
(con't) 5) Compact using excavator bucket or dozer.	Improper installation of attachment could cause the attachment to fall off during – potentially causing injuries and property damages.	Although the excavator will not be used for hoisting, the manufacturer's requirements for attaching an attachment must be followed precisely and be inspected as required by the manufacturer. EM 385-1-1 states: 16.A.03-The employer shall comply with all manufacturer's instructions, procedures and recommendations applicable to the operational functions of equipment, including use with attachments. 16. A.10 The manufacturer's specifications and operating manuals for hydraulic equipment and attachments utilizing quick connect/disconnect systems shall be followed. After completing a switch in attachments, the equipment operator shall take the actions necessary to ensure the quick connect/disconnect system is positively engaged. When this operation is performed, nearby workers will be at least 20-feet away from the equipment (the manufacturer may recommend a greater distance.)	M
	Workers exposed to dust during compaction process.	Use fine mist of water to keep dust suppressed.	M
	Noise from operating equipment	Wear hearing protection when working on the ground in the vicinity of the excavator.	L

AHA #6 – Job/Task: Backfill of Excavation and Regrading		
Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Excavator, dump trucks, excavator with compactor wheel attachment, dozer.	Only qualified persons may operate equipment. Operator’s manual must be reviewed and be available on-site. Only DMV-licensed personnel will operate trucks.	Daily and before use. Use inspection checklists. If compactor wheel attachment is used, ensure that the attachment is attached, inspected and tested per the manufacturer’s instructions.
Fire extinguishers	Fire extinguisher training including use/limitations.	At least monthly by SSHO or designee.
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking (29 CFR 1926.50[d][2]). First aid kits must be filled per EM 385-1-1 Table 3-1.

Abbreviations and Acronyms:

- AHA - Activity Hazard Analysis
- APP – Accident Prevention Plan
- CFR – Code of Federal Regulations
- CIH – Certified Industrial Hygienist
- CSP – Certified Safety Professional
- DMV – Department of Motor Vehicles
- EM – Engineer Manual
- PPE – Personal Protection Equipment
- RAC – Risk Assessment Code
- SSHO – Site Safety and Health Officer
- SSHP - Site Safety and Health Plan
- TiEC – Tetra Tech EC, Inc.

Activity Hazard Analysis (AHA) #7

Job/Task: Gravel Placement and Asphalt Cap Installation	Overall Risk Assessment Code (RAC) (Use highest code)	M				
Project Location: Oceana NTCRA; Virginia Beach, VA	Risk Assessment Code (RAC) Matrix					
Contract Number: N40085-11-D-0043	Severity	Probability				
Date Prepared: Revision Date February 2, 2012		Frequent Likely Occasional Seldom Unlikely				
Prepared by (Name/Title): Lee Dixon, ESQ Regulatory Specialist	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, Program CIH	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L
<p>Notes: (Field Notes, Review Comments, etc.)</p> <p>In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP/SSHP. TtEC Corporate Safety Programs and the EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.</p>	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 is 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 is 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 the AHA. Annotate the overall highest RAC at the top of the AHA.				M = Moderate Risk	
				L = Low Risk		

AHA #7 – Job/Task: Gravel Placement and Asphalt Cap Installation			
Job Steps	Hazards	Controls	RAC
1) Haul clean crushed gravel	Workers could be struck by or against heavy equipment or trucks.	Establish and follow a traffic control plan. Wear reflective high-visibility vests. Avoid equipment swing areas and designated traffic routes. Make eye contact with operators before approaching equipment or trucks. Understand and review posted hand signals. Use spotters and flaggers, as necessary, to direct trucks, as well as any nearby traffic. Ensure proper illumination in all work areas.	M
	Drivers of trucks could be injured by loads as they are being placed in trucks.	Prohibit truck drivers from standing near trucks as they are being loaded. Prohibit truck drivers from sitting in the cab of trucks as they are being loaded, unless the truck is equipped with a cab protector (FOPS).	M

AHA #7 – Job/Task: Gravel Placement and Asphalt Cap Installation			
Job Steps	Hazards	Controls	RAC
2) Dump load at excavation site.	Workers could be struck by or against heavy equipment or trucks.	Provide spotters for dumping and/or direction of placement of loads. Ground workers will maintain distance from dumping truck and loaders. Dump trucks will maintain a safe distance from excavation edges when dumping. Workers will avoid standing near edges of excavations.	M
	Workers could get hands, feet or the body caught between equipment and the other objects or the ground.	Never position arms, hands, feet between moving and stationary parts. Never use arms, hand or feet to remove stuck material in gates, doors, etc. Never place body or head into the dump of a dump truck.	M
	Workers exposed to contaminants in dust (soil has high lead content) during unloading process.	Dump truck drivers will not exit cab of truck. Control dust generation by spraying excavation with light water mist. Wear PPE specified in SSHP: Disposable coveralls, boots with boot covers (or steel-toe PVC boots), nitrile or latex gloves, safety glasses and hard hat. If dust is visible, work must stop and workers must wear a full face respirator with P-100 cartridges. The disposable coveralls must be changed to coveralls with and attached hood.	M
	Dirt and dust can accumulate on roads used for transport of material	Brush off trucks before they enter a paved road. Workers will not climb trucks to tarp the truck.	M
3) Use heavy equipment; dump trucks and paving equipment working in area.	Workers could be struck by or against heavy equipment.	Wear high-visibility reflective vests. Make eye contact with operators before approaching equipment. Understand and review hand signals. Stay clear of moving equipment unless necessary. Identify and avoid pinch points.	M
	Defective equipment could cause injury to workers or damage to other equipment.	Inspect all equipment when it arrives on-site. All equipment must be certified as operable by a competent mechanic. Any equipment that does not pass inspection must not be used.	M
	Noise could cause hearing loss.	Hearing protection is required when sound levels exceed 84 dBA continuously. Usually this will only be for workers working in unenclosed cabs of heavy equipment or ground workers working near heavy equipment.	M
	Equipment could strike trees and other objects located nearby, such as fences and buildings.	Operators must drive carefully. Any time equipment is backed up, the driver will either use a spotter, or the driver must visually clear the area before backing up.	M
	Traffic in area could be affected by work.	Follow the site traffic control procedure. Obtain clearances for any traffic diversion, control, or closure.	M

AHA #7 – Job/Task: Gravel Placement and Asphalt Cap Installation			
Job Steps	Hazards	Controls	RAC
4) Handling material	Strains, sprains, other injury could occur.	Use proper lifting techniques such as keeping back straight, lifting with legs, avoiding twisting, and getting help when moving bulky/heavy materials and equipment weighing more than 50 pounds. This limit may be lowered by the SSHO after worker fitness level assessment. Maintain communication with others involved in material handling.	M
	Unloaded material could fall on workers and injure them.	Workers will stand back from any load that is being unloaded.	M
	Working with hand tools such as shovels and rakes could injure workers.	Inspect all tools before each use. Remove defective tools from service. Handle tools properly. Avoid repetitive motions for an extended period of time by rotating tasks among the workers.	M
	Contact could occur with hot equipment such as burners, hoppers, etc.	Avoid touching hot parts of equipment. Wear protective gloves.	M
5) Working with hot asphalt	Contact with hot asphalt could occur.	Wear proper personal protective equipment (head, ear, eye, foot, and hand protection). The National Asphalt Pavement Association recommends: <ol style="list-style-type: none"> 1. Chemical goggles and an 8-inch minimum-size face shield. 2. Loose clothing in good condition with collars closed and cuffs buttoned at the wrist. 3. Glove gauntlets that extend up the arm worn loosely so that they can be easily flipped off if covered with hot asphalt. 4. Boots with tops at least 6 inches high and laced without openings through which asphalt could reach skin. 5. Cuffless pants that extend over tops of boots. 	M

AHA #7 – Job/Task: Gravel Placement and Asphalt Cap Installation			
Job Steps	Hazards	Controls	RAC
(con't) 5) Working with hot asphalt		<p>Long-handled sprayers with flexible hoses should be used when emulsified asphalts are applied by hand for tack coats, or when cutback asphalt is applied by hand for prime coats.</p> <p>Remove asphalt immediately after skin contact.</p> <p>Avoid inhaling asphalt fumes.</p> <p>MSDSs must be available for the asphalt and all other materials used, such as asphalt cutback, emulsifiers, and solvents. All workers must be trained on the MSDSs.</p>	M
	Asphalt vapors are combustible when heated; cutbacks and emulsifiers may be flammable.	<p>Use a fire protection program that includes the following elements developed by the National Asphalt Pavement Association:</p> <ol style="list-style-type: none"> 1. Prohibit smoking except in designated areas. 2. Keep asphalt distributors clean and free from asphalt accumulations. Before spraying, shut off burners. 3. Keep exterior parts of distributor truck exhaust system clean to remove debris that could ignite and fall in path of the spray bar. 4. Be prepared to shut off the distributor spray bar. 5. Make sure at least two 20-pound, dry chemical, ABC fire extinguishers are available in the vicinity (within 50 feet). 	
	Elevated temperature could cause physical hazards.	Monitor ambient temperature to ensure that employees drink plenty of fluids and use work/rest cycles to avoid heat exhaustion. Monitor for heat stress as described in EHS 4-6 (pulse, body temperature).	

AHA #7 – Job/Task: Gravel Placement and Asphalt Cap Installation		
Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements
Flagging materials	Provide flagger training.	Ensure that materials comply with Traffic Control Plan specifications. Inspect signage regularly.
Trucks, pavers, rollers	Provide specific training for equipment used.	Daily and before use. All equipment must be inspected and certified by a competent mechanic by using the safety inspection checklist.
Power tools and hand tools	Must be qualified to use or operate. Ensure users' manuals have been reviewed.	Inspect before each use. The SSHO will inspect electrical cords and connections daily.

Abbreviations and Acronyms:

- AHA - Activity Hazard Analysis
- APP – Accident Prevention Plan
- CIH – Certified Industrial Hygienist
- CSP – Certified Safety Professional
- dB A – decibels, A-scale
- EHS – Environmental Health and Safety
- EM – Engineer Manual
- MSDS – material safety data sheet
- PPE - personal protective equipment
- RAC – Risk Assessment Code
- SSHO – Site Safety and Health Officer
- SSHP - Site Safety and Health Plan
- TiEC – Tetra Tech EC, Inc.

Activity Hazard Analysis (AHA) #8

Job/Task: Site Restoration	Overall Risk Assessment Code (RAC) (Use highest code)	M
Project Location: Oceana NTCRA; Virginia Beach, VA	Risk Assessment Code (RAC) Matrix	
Contract Number: N40085-11-D-0043	Severity	Probability
Date Prepared: Revision Date February 2, 2012		Frequent Likely Occasional Seldom Unlikely
Prepared by (Name/Title): Lee Dixon, ESQ Regulatory Specialist	Catastrophic	E E H H M
	Critical	E H H M L
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, Program CIH	Marginal	H M M L L
	Negligible	M L L L L
Notes: (Field Notes, Review Comments, etc.) In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP/SSHP. TtEC Corporate Safety Programs and the EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.	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 is 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 is identified as Catastrophic, Critical, Marginal, or Negligible.	
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on the AHA. Annotate the overall highest RAC at the top of the AHA.	
		E = Extremely High Risk H = High Risk M = Moderate Risk L = Low Risk

AHA #8 – Job/Task: Site Restoration			
Job Steps	Hazards	Controls	RAC
Hydroseeding			
1. Truck arrives on site-vehicle must be loaded with water and product	Failure to inspect truck on arrival at site could cause potential damages to truck or other equipment and property. Malfunctioning truck could injure workers and others.	As required by the SHSP, the Site Superintendent, the operator of the truck and the SHSS will inspect the truck upon arrival at the site. They will ensure that the operator's manual is present and reviewed by the operator. Assure that brakes work. Inspect tires and other key components. If truck does not pass inspection, do not use until repairs are made. They will ensure that they have a mechanic's certification of inspection (obtained from a vendor or other licensed mechanic). This inspection will be documented and photographs of the equipment taken if the truck is leased by TtEC.	M

AHA #8 – Job/Task: Site Restoration			
Job Steps	Hazards	Controls	RAC
(Con't) 1. Truck arrives on site-vehicle must be loaded with water and product	Slip, trip, and fall hazards.	Visually inspect truck, especially truck deck for slip, trip, and fall hazards. Truck will be inspected during daylight hours. When truck is loaded with water, slipping hazards may be created. Avoid creating this hazard and wear slip resistant boots. Refer to EHS Procedure 3-8, Fall Protection.	M
2. Load truck with water and seed.	Strains from manually moving materials and equipment.	Use proper lifting techniques, such as keeping back straight, lifting with legs, limiting twisting, and getting help when moving bulky/heavy materials and equipment. Use lifting devices whenever possible. Refer to EHS Procedure 3-1, Ergonomics. Do not lift more than 50 pounds without help. This limit may be lowered by the SSHA after assessment of worker fitness level.	M
3. Accessing hydroseeder	Worker could fall off equipment	Use equipment footholds and hand holds provided for safe access. Do not carry materials since 3-points of contact must be made while climbing	M
	Worker may not properly be tied off or secured when hydroseeding	Ensure that contractor is following their work plan on fall protection.	M
	Communication	Ensure that good communication exists between the truck driver of the hydroseeder and the person applying the seed mixture if two person operation applies.	M
4. Truck begins hydroseeding operation	Struck by or pinned against heavy equipment.	Wear high-visibility safety vests. Make eye contact with operators before approaching equipment. Understand and review posted hand signals.	M
	Truck has potential to roll over if not driven properly	Drive truck slowly. Drive truck parallel to slopes. Mark all bump and rut hazards or assure that driver is aware as to where these hazards are located. Water in truck tank causes center of gravity shifts as water moves in tank. Operator must be familiar with handling a vehicle like this.	M

AHA #8 – Job/Task: Site Restoration			
Job Steps	Hazards	Controls	RAC
(Con't) 4. Truck begins hydroseeding operation	If worker is working from deck (operating nozzle) worker could be thrown from deck as truck is driven.	Ensure that there is communication between driver of truck and operator of nozzle. Deck must be “approved” for nozzle operator to be on deck: If platform is used, ensure fall protection and guardrails meet OSHA and EM 385-1-1 requirements for fall protection. Operator must be secured to deck of truck by a tie-off and harness. Truck driver must drive slowly at speeds recommended by manufacturer to avoid any movement that could cause nozzle operator to loose footing.	M
	Nozzle of hydroseeder could injure workers or damage property if used improperly.	Never point nozzle directly at people. Use nozzle in a fashion to avoid pointing it at any one location for an extended duration. Remove from the area any property that could be damaged. Nozzle must have the ability to be immediately shut off in the event of an emergency.	M
	Noise from hydroseeding operation.	Verify that noise levels do not exceed 84 dBA. If it does, worker(s) must wear hearing protection.	L
	Exposure to hydroseeding mist containing fertilizer.	Consult with the MSDS on the constituents of the mixture. Avoid breathing mist. Wear particulate filters if mist cannot be avoided. Pay attention to wind directions to avoid material flying back into operator and nearby personnel.	L
	Grass seeds may produce allergy symptoms in some individuals	Select individuals that when exposed to grass seed will not experience allergy symptoms.	L
	Dust emissions from operation could expose workers or the environment to dust.	Drive at slow speeds to avoid generating dust. Use dust control (fine water mist).	L
5. Climbing up & down slopes to lay erosion control mat.	Inadequately trained or incapable worker could have difficulty climbing down or back up. Slipping while climbing could occur.	Ensure that worker has capability to climb sides. Worker should wear leather gloves if using rope as a climbing aid. Use of spikes attached to boots may assist worker in climbing up. Slopes greater than 1:1 (45°) will require workers to tie off and have a lifeline to restrain falls.	M
6. Placing erosion control mat.	Slips, trips, and falls from various agents are potential hazards.	Work areas will be visually inspected and pre-existing slip, trip, and fall hazards will be marked, barricaded, or eliminated as feasible. Work areas will be kept neat and orderly. Proper illumination will be maintained in work areas. Inspect each work area for ground squirrel holes, other ruts, and obstructions. Visually inspect for soft soil. Be aware that when mat is placed it could cover ruts and holes and if workers walk on mat they could trip and fall. Do not cover any holes or ruts or do not cover these with a mat until they are repaired.	M

AHA #8 – Job/Task: Site Restoration			
Job Steps	Hazards	Controls	RAC
(Con't) 6. Placing erosion control mat.	Failure to properly survey site could cause exposure to ground hazards.	Ensure that ground is free of hazards such as unstable soil on slopes of berms.	M
	Strains from manually moving tools and erosion control mat.	Use proper lifting techniques (lift with legs, limit twisting motion, gets assistance when handling bulky materials.) Do not lift more than 50 pounds without assistance. This limit may be lowered by SSHO after assessment of worker fitness level. Use mechanical means when possible. Determine if mats can be lowered by mechanical means so that workers do not have to carry them down the slopes.	M
	Workers could get hands, feet or the body caught between equipment and the other objects or the ground.	Never position arms, hands, feet between moving and stationary parts. Never use arms, hand or feet to remove stuck material in gates, doors, etc. Never place body or head into the dump of a dump truck.	M
	Skin contact may cause irritation or dermatitis	When applying mixture ensure that rubber gloves are worn along with a long sleeve shirt. Wash hands thoroughly when completed and prior to taking anything by mouth.	
	Slips, trips, and falls from various agents are potential hazards.	Work areas will be visually inspected and pre-existing slip, trip, and fall hazards will be marked, barricaded, or eliminated as feasible. Work areas will be kept neat and orderly. Proper illumination will be maintained in work areas. Inspect each work area for ground squirrel holes, other ruts, and obstructions. Visually inspect for soft soil.	M

AHA #8 – Job/Task: Site Restoration		
Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Heavy equipment (water trucks, hydroseeding unit mounted on a truck, excavator), pickup trucks	Daily and before use. Use equipment safety checklists as required by the FEAD.	Only qualified/licensed and trained personnel will operate heavy equipment. Operator's manual for each piece of equipment to be reviewed by operators and manufactures recommendations followed for safe operation. Each equipment manual maintained on site and available for review.
Equipment (power tools, hand tools, etc.)	Inspect all tools before each use following manufacturers' requirements. Discard or tag out-of-service, any tools that are damaged. Do not use power tools that have frayed cords or exposed wiring. All power tools must have a grounding plug or be double insulated.	Specific training for power tools and hand tools will be provided.
Utility knife	Personnel using knives must review this AHA and be aware of the hazards of improper use and storage of the knife.	Before each use. Ensure blade retracts fully when not in use and that it can be locked in that position when not in use. Ensure blade is clean and sharp.
Fire extinguishers	Fire extinguisher training including use/limitations.	At least monthly by SSHO or designee.
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking (29 CFR 1926.50[d][2]). First aid kits must be filled per EM 385-1-1 Table 3-1.

Abbreviations and Acronyms:

AHA - Activity Hazard Analysis
 APP – Accident Prevention Plan
 CFR – Code of Federal Regulations
 CIH – Certified Industrial Hygienist
 CSP – Certified Safety Professional
 DMV – Department of Motor Vehicles
 EM – Engineer Manual
 FEAD - Facilities Engineering and Acquisition Division
 MSDS – Material Safety Data Sheet
 OSHA – Occupational Safety and Health Administration
 PG – Professional Geologist
 PPE – Personal Protection Equipment
 PVC – Polyvinyl Chloride
 RAC – Risk Assessment Code
 SSHO – Site Safety and Health Officer
 SSHP - Site Safety and Health Plan
 TTEC – Tetra Tech EC, Inc.

Activity Hazard Analysis (AHA) #9

Job/Task: Demobilization	Overall Risk Assessment Code (RAC) (Use highest code)	M
Project Location: Oceana NTCRA; Virginia Beach, VA	Risk Assessment Code (RAC) Matrix	
Contract Number N40085-11-D-0043	Severity	Probability
Date Prepared: Revision Date February 2, 2012		Frequent Likely Occasional Seldom Unlikely
Prepared by (Name/Title): Lee Dixon, ESQ Regulatory Specialist	Catastrophic	E E H H M
	Critical	E H H M L
Reviewed by (Name/Title): Roger Margotto, CIH, CSP	Marginal	H M M L L
	Negligible	M L L L L
Notes: (Field Notes, Review Comments, etc.) In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP/SSHP. TtEC Corporate Safety Programs and the EM 385-1-1 will also be available on site for review of specific materials and mitigation measures.	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

AHA #9 – Demobilization			
Job Steps	Hazards	Controls	RAC
1. Demobilize from the site	Workers could be struck by, or against, heavy equipment.	Follow traffic rules and regulations within and around the project site. Wear seatbelts in all vehicles at all times. Drive defensively and be aware of vehicles and people around the site.	M

AHA #9 – Demobilization			
Job Steps	Hazards	Controls	RAC
(con't) 1. Demobilize from the site	Electrocutation hazards may be present.	<p>Inspect all extension cords daily for structural integrity, ground continuity, and damaged areas. Document the extension cord inspection. Use GFCIs on all outdoor 115- to 120-volt, 20 ampere or less, circuits. Cover, or elevate, all electric wire or flexible cord passing through the work area to protect it from damage by foot traffic, vehicles, sharp corners, projections, or pinching.</p> <p>Keep plugs and receptacles out of water unless they are of an approved submersible type. Ground all electrical circuits in accordance with the NEC, or other applicable regulations or standards. Temporary wiring is not allowed to pass through walls, doors, or windows (extension cords are one type of temporary wiring).</p> <p>If a generator is used, be sure that it is a type that does not require grounding. If it requires grounding, follow the manufacturer's directions. NEC 250-6 lists the exceptions for grounding portable and vehicle-mounted generators.</p> <p>Allow only qualified electricians to disconnect any hard-wired electrical circuits. Live electrical work requires a permit as specified in EM 385-1-1, Section 11.A.02.c, and follow Lock-Out/Tag-Out protocols.</p>	M
	Strains could occur from manually moving materials and equipment.	<p>Use proper lifting techniques such as keeping the back straight, lifting with legs, limiting twisting, and getting help when moving bulky/heavy materials and equipment. Use lifting devices whenever possible.</p> <p>Hand tools shall be selected to minimize the following stressors: chronic muscle contraction or steady force, extreme or awkward finger/hand/arm positions, repetitive forceful motions, excessive gripping, pinching, or pressing with hand and fingers.</p> <p>Identify and avoid pinch points. Maintain communication with others involved in material handling. Use appropriate PPE.</p> <p>Do not lift more than 50 pounds without assistance. This weight limit may be lowered based on the SSHO's assessment of the worker's fitness level. Perform stretch/flex exercises before task.</p>	M
2. Loading of Equipment	Improper material handling could expose workers to injury.	Identify and avoid pinch points. Maintain communication with others involved in material handling. Use appropriate PPE.	L

AHA #9 – Demobilization			
Job Steps	Hazards	Controls	RAC
3. Decontaminate equipment, as needed	Workers could be exposed to potentially contaminated dust and soil (soil has high levels of lead). Workers could be injured if they slip or fall.	Dry Decon backhoe and trucks prior to accessing roadways, in a paved area, to avoid creating and dropping soil onto roadways. Do not climb on backhoe/ truck tops, and avoid aggressive brushing/ brooming of soil. Wear PPE specified in SSHP: Disposable coveralls, boots with boot covers (or steel-toe PVC boots), nitrile or latex gloves, safety glasses and hard hat. Avoid stirring up dust when moving in and around the excavation. Control dust generation with light water mist. If dust is visible, work must stop and workers must wear a full face respirator with P-100 cartridges. The disposable coveralls must be changed to coveralls with and attached hood. Never point or spray personnel with a pressure washer. Avoid working on a muddy surface & wear slip resistant boots.	M
	Eye injury/skin contact with contaminated soil/dust	Wear required eye-splash protection and nitrile gloves, per SSHP. Thoroughly wash hands and arms after completing decontamination of equipment and doffing of PPE. Do not eat, smoke, and apply sunscreen lotion and other skin protection creams or lotions, etc., until hands are washed.	M
	Waste Handling	Take care when transporting waste on site. Dispose of used decontamination water in accordance with the WMP.	M
	Heat stress risks	Monitor for heat stress in accordance with EHS Procedure 4-6 "Temperature Extremes." Maintain fluid intake and take breaks as needed.	M
	Workers could be exposed to contaminated wash/ rinse water.	Wear PPE consisting of nitrile glove, polytyvek coveralls (or PVC rain suit), rubber, latex or other type of boot covers, safety glasses, face shield, and hard hats. Hard-toe boots are also required. Hard -toed PVC may be used. (Boots must meet ASTM specifications)	M
	Areas can be slippery.	Wear slip-resistant boots or boot covers.	L
4. Drum handling; decontamination water transfer	Musculoskeletal injury	If handling drums, use a drum dolly, or a drum grabber attached to a backhoe or excavator to move the drums to storage. Inspect the path that the drum must be moved over. Ensure that there are no ruts or other obstacles that can cause the drum to tip over, or be difficult to handle over the surface being traversed. Place drums in an approved storage area. When manually handling drums, avoid placing hands between the drums in order to avoid pinching the fingers. Wear leather work gloves. If drums must be manually positioned, use the "break & roll" method to move a drum. Avoid manually positioning drums if at all possible. Only one person should break & roll a drum if it must be manually moved without mechanical assistance.	M

AHA #9 – Demobilization			
Job Steps	Hazards	Controls	RAC
(con't) 4. Drum handling; decontamination water transfer		If transporting drums by pickup, use a truck that has a lift gate and move the drum onto the lift using a drum dolly. Make sure that the drum is secured and will not roll when the lift is raised Secure all drums in place on the truck.	M
		Use pumps to fill drums or tanks with decontamination water.	M
	Containers may leak and expose workers to chemical hazards.	Inspect all containers on a regular basis (weekly for non-hazardous material; daily for hazardous material). Have spill cleanup supplies and equipment readily available. The surface may become slippery. Wear work boots with good traction soles. Avoid exposure to the material, and wear appropriate PPE. Clean up all spills immediately. Notify the supervisor.	M

AHA #9 - Demobilization		
Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Vehicles – pickup trucks	Department of Motor Vehicles-licensed personnel will operate vehicles.	Inspect daily, and before use. Use the equipment safety checklist found in the SSHP.
Backhoe	Only trained equipment operators may operate a backhoe and vacuum truck. The operator’s manual is to be reviewed by all operators, and the manual maintained on site.	Initial receipt and inspection and certification by a mechanic required. Inspect upon arrival at site as specified in this AHA. Inspect daily, or before use. Use the required inspection checklist for daily equipment inspection.
Hand tools – drills, screwdrivers, hammers, pliers, etc.	Personnel must have reviewed operator’s manual and have been trained on power tools. Only qualified person will operate equipment	Inspect hand tools before each use following manufacturer’s requirements. Discard or tag out-of-service, any tools that are damaged. Do not use power tools that have frayed cords or exposed wiring. All power tools must have a grounding plug or be double insulated.
Sampling Equipment	Use of equipment must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, by or under direction of the SSHO.	Daily inspection and calibration by users/operators.

AHA #9 - Demobilization		
Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Fire extinguishers	Fire extinguisher training including use/limitations is required.	At least monthly by SSHO or designee.
First aid kits and other emergency equipment	Emergency equipment/first aid kits must be used by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking (29 CFR 1926.50[d][2]). First aid kits must be filled per EM 385-1-1 Table 3-1.

Abbreviations and Acronyms:

- AHA – Activity Hazard Analysis
- CFR – Code of Federal Regulations
- CIH – Certified Industrial Hygienist
- CSP – Certified Safety Professional
- DMV – Department of Motor Vehicles
- EM – Engineer Manual
- GFCI – Ground Fault Circuit Interrupter
- MSDS – Material Safety Data Sheet
- NEC – National Electrical Code
- OSHA – Occupational Safety and Health Administration
- PG – Professional Geologist
- PPE – Personal Protection Equipment
- PVC – Polyvinyl Chloride
- RAC – Risk Assessment Code
- SSHO – Site Safety and Health Officer
- SSHP - Site Safety and Health Plan
- TtEC – Tetra Tech EC, Inc.

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APPENDIX C
PPE SELECTION FORM

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EXAMPLE

Personal Protective Equipment Selection

TASK	HEAD	EYES/FACE	FEET	HANDS	BODY	HEARING	RESPIRATORY
• Mobilization SAMPLE FORM	HH	SG	STB	LWG	WC	EP as needed	Initial LOP: D-

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APPENDIX D
MEDICAL DATA SHEET

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SES-TECH, INC.
MEDICAL DATA SHEET
(Voluntary)

This brief data sheet should be completed by all on-site personnel and kept by the Site Supervisor or SSHO during site operations. Your health & safety is our priority. Under HIPPA you are entitled to complete privacy in regards to your medical information. The information you provide below will be used only if a medical necessity arises and shared only with those who would need to know to assist in addressing the medical and/or workers compensation event.

SITE: Oceana Salvage Yard Access Road Non-Time Critical Removal Action –Virginia Beach, VA

NAME: _____

HEIGHT: _____ WEIGHT: _____ BLOOD TYPE: (if known) _____

ADDRESS: _____

EMERGENCY CONTACT: _____
(Telephone Number): _____

DRUG or OTHER ALLERGIES: _____

DO YOU WEAR CONTACTS? _____

HAVE YOU EVER BEEN HOSPITALIZED AS A RESULT OF A KNOWN CHEMICAL EXPOSURE? _____

DATE OF EXPOSURE ___ / ___ / ___

EXPOSURE INFORMATION: _____

WHAT MEDICATIONS ARE YOU PRESENTLY USING? _____

DO YOU HAVE ANY MEDICAL RESTRICTIONS? _____

NAME, ADDRESS AND PHONE NUMBER OF PERSONAL PHYSICIAN:

This form may contain personal or sensitive information – Protect Accordingly!
Destroy when no longer needed

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APPENDIX E
WORK RULES

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GENERAL HEALTH AND SAFETY WORK RULES

1. All site personnel must attend Site Specific Training/Orientation and attend any tail gate briefing prior to start of daily work activities (at the discretion of and as directed by SSHO).
2. Any individual taking prescribed drugs shall inform the SSHO of the type of medication. The SSHO will review the matter with the PESM and the Corporate Medical Consultant (CMC), who will decide if the employee can safely work on-site while taking the medication.
3. The personal protective equipment specified by the SSHO in the EHS plan(s) shall be worn by all site personnel. This includes hard hats and safety glasses that must be worn at all times in the active work areas.
4. All personnel must sign the site log and exclusion zone log when used at the site.
5. Personnel must follow proper decontamination procedures (and shower- only if needed) at the end of the work shift.
6. Eating, drinking, chewing tobacco or gum, smoking and any other practice that may increase the possibility of hand-to-mouth contact is prohibited in the exclusion zone or the contamination reduction zone. (Exceptions may be permitted by the PESM to allow fluid intake during heat stress conditions.)
7. All lighters, matches, cigarettes and other forms of tobacco are prohibited in the Exclusion Zone.
8. All signs and demarcations shall be followed. Such signs and demarcation shall not be removed, except as authorized by the SSHO.
9. No one shall enter a permit-required confined space.
10. All personnel must follow the work-rest regimens and other practices required by the heat stress program.
11. All personnel must follow lockout/tagout procedures when working on equipment involving moving parts or hazardous energy sources.
12. No person shall operate equipment unless trained and authorized.
13. Ladders and scaffolds shall be solidly constructed, in good working condition, and inspected prior to use. No one may use defective ladders or scaffolds.
14. Fall protection or fall arrest systems must be in place when working at elevations greater than six feet for temporary working surfaces and four feet for fixed platforms.

**HEALTH AND SAFETY WORK RULES
(CONTINUED)**

15. Safety belts, harness and lanyards must be selected by the SSHO. The user must inspect the equipment prior to use. No defective personal fall protection equipment shall be used. Personal fall protection that has been shock loaded must be discarded.
16. Hand and portable power tools must be inspected prior to use. Defective tools and equipment shall not be used.
17. Ground fault interrupters shall be used for cord and plug equipment used outdoors or in damp locations. Electrical cords shall be kept out walkways and puddles unless protected and rated for the service.
18. Improper use, mishandling, or tampering with health and safety equipment and samples is prohibited.
19. Horseplay of any kind is prohibited.
20. Possession or use of alcoholic beverages, controlled substances or firearms on any site is forbidden.
21. All incidents, no matter how minor, must be reported immediately to the SSHO.
22. All personnel shall be familiar with the Site Emergency Response Plan.

The above Health and Safety Rules are not all inclusive and it is your responsibility to comply with all regulations set forth by OSHA, the SES-TECH Environmental, Health and Safety Programs, the EHS plan(s), the client, SES-TECH Project Manager and SES-TECH SSHO.

APPENDIX F

HOSPITAL ROUTE AND NONEMERGENCY CLINIC ROUTE MAPS

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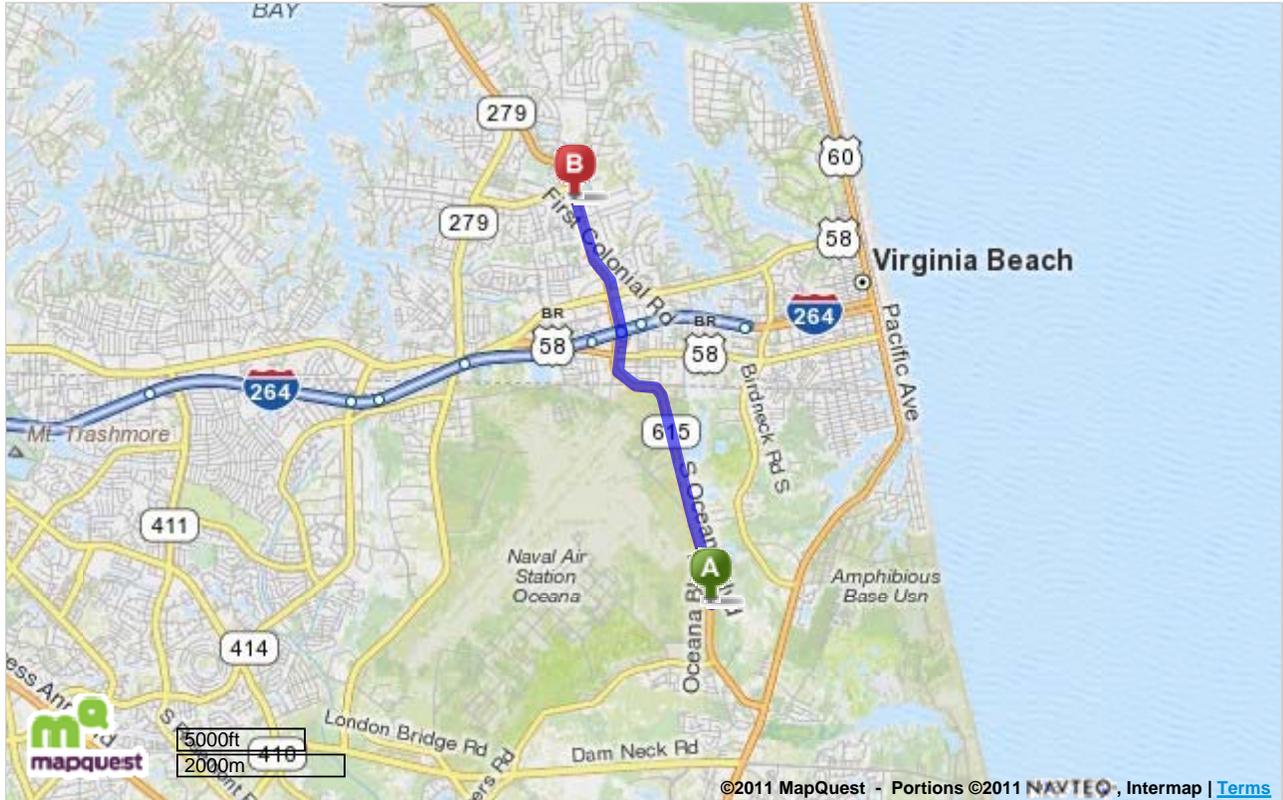
Trip to:
 1060 First Colonial Rd
 Virginia Beach, VA 23454-3002
4.32 miles
7 minutes

Notes

Sentara Virginia Beach General Hospital
 (EMERGENCY Facility) - Route Map

	1040 Oceana Blvd Virginia Beach, VA 23454-4980	Miles Per Section
	1. Start out going north on Oceana Blvd / S Oceana Blvd / VA-615 N toward Bells Rd . Continue to follow Oceana Blvd / VA-615 N .	Go 2.6 Mi
	2. Oceana Blvd / VA-615 N becomes First Colonial Rd .	Go 1.7 Mi
	3. 1060 FIRST COLONIAL RD. <i>Your destination is just past Colonial Medical Ct</i> <i>If you reach First General Pky you've gone a little too far</i>	
	1060 First Colonial Rd Virginia Beach, VA 23454-3002	4.3 mi

Total Travel Estimate: **4.32 miles - about 7 minutes**



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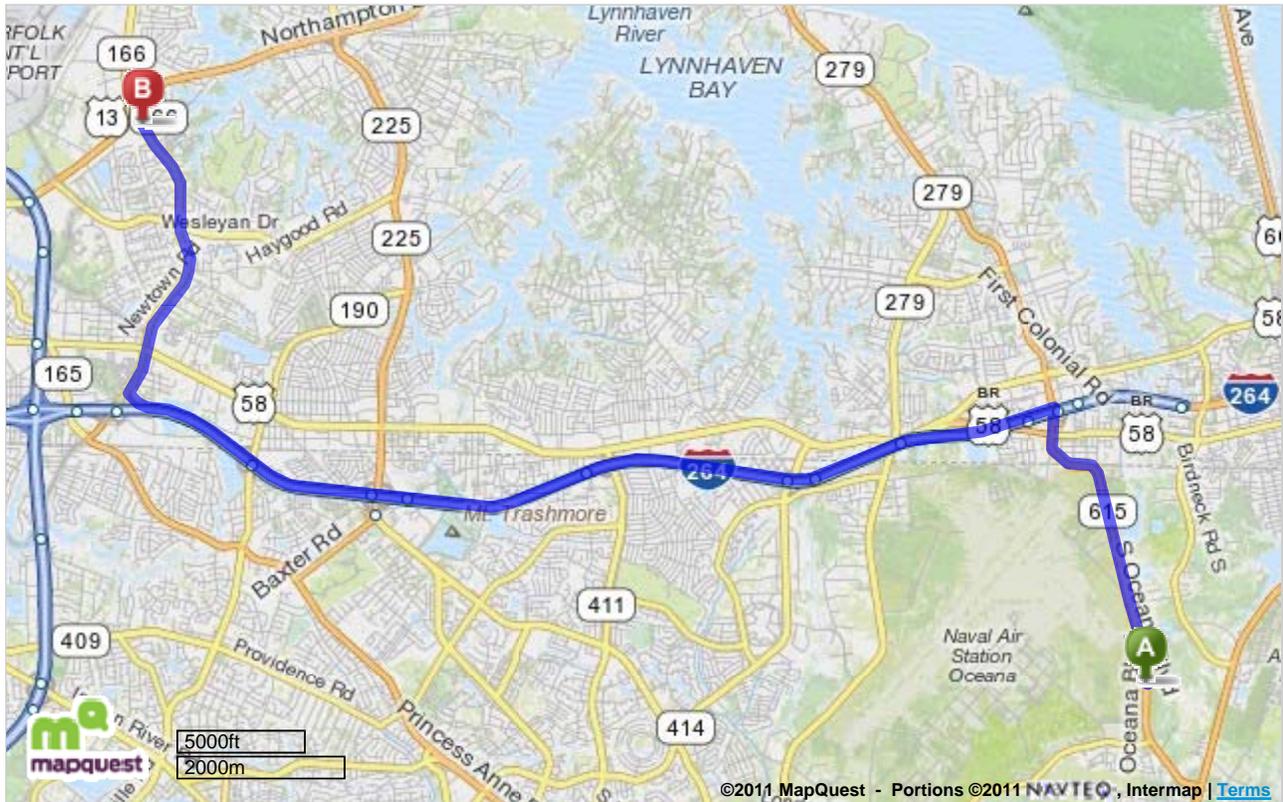
Trip to:
 1290 Diamond Springs Rd
 Virginia Beach, VA 23455-3701
15.20 miles
21 minutes

Notes

I&O Medical Center Occupational Health
 Clinic (Non-Emergency Facility) - Route Map

	1040 Oceana Blvd Virginia Beach, VA 23454-4980	Miles Per Section
	1. Start out going north on Oceana Blvd / S Oceana Blvd / VA-615 N toward Bells Rd . Continue to follow Oceana Blvd / VA-615 N .	Go 2.6 Mi
	2. Oceana Blvd / VA-615 N becomes First Colonial Rd .	Go 0.4 Mi
	3. Merge onto I-264 W / Norfolk-Virginia Beach Expy via the ramp on the left toward Norfolk . <i>If you reach Donna Dr you've gone about 0.1 miles too far</i>	Go 8.7 Mi
	4. Take the Newton Rd exit toward I-64 W / Richmond / US-13 / Military Hwy .	Go 0.4 Mi
	5. Take the Newtown Rd exit.	Go 0.3 Mi
	6. Turn right onto Newtown Rd / N Newtown Rd / VA-403 . Continue to follow Newtown Rd . <i>If you are on Stony Pt S and reach Cornwallis Ln you've gone a little too far</i>	Go 1.3 Mi
	7. Stay straight to go onto Diamond Springs Rd .	Go 1.5 Mi
	8. 1290 DIAMOND SPRINGS RD is on the right . <i>Your destination is just past Shell Rd</i> <i>If you are on Diamond Springs Rd and reach Ward Ave you've gone about 0.4 miles too far</i>	
	1290 Diamond Springs Rd Virginia Beach, VA 23455-3701	15.2 mi

Total Travel Estimate: **15.20 miles - about 21 minutes**



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APPENDIX G

IMPROVING INJURED WORKER CASE MANAGEMENT

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Issue No: 108 Improving Injured Worker Case Management

Preventing injuries is always our first priority. However, when an injury does occur, we have found that the overall severity of the injury and the amount of OSHA recordkeeping required for the injury can be greatly reduced when we implement effective case management. Injury cases are managed effectively when we consider them “life cycle” responses:

1. We are properly prepared prior to the injury to effectively respond
2. We notify and involve the right people from the moment the injury occurs. This always includes notifying our primary medical provider, WorkCare at 800-455-6155 (available 24 hrs).
3. We continue to monitor the case throughout the diagnostic and treatment process until the injured worker returns to duty or leaves the company.

This ZIP bulletin provides steps that should be taken to improve case management.

All sites are asked to review the following information with their personnel, complete the *italicized* sections for their project, and post this ZIP bulletin in conspicuous locations. Applicable information from the ZIP bulletin should be included in future changes to existing plans. Future projects should include this information in applicable Health and Safety Plans, including Incident Prevention Plans.

What Actions Should We Take Before Field Work Begins?

- Contact WorkCare at the 800-455-6155, let them know you are with SES-TECH, and obtain the name, address, and phone number for a local WorkCare-approved clinic.
- Enter this information in to the project Health and Safety Plan.
- Post all emergency phone numbers with the route/map to hospital/clinic in vehicles and in trailers.
- Ensure that all site employees are aware of the emergency phone number listing, how to make the call, and the location of the route maps. Reinforce this message during safety briefings.
- Hold and critique site emergency notification and response drills.
- Establish a personal relationship with local clinic/hospital/local emergency response organizations by calling them and visiting their location. WorkCare recommends the following:

Prior to working, make a site visit to the clinic and discuss treatment options with the physician. A discussion with the doctor would include mention of SES-TECH's desire to take advantage of all potential first aid opportunities, rather than a recordable medical treatment.. If the physician would keep that in mind when evaluating the injury that you would really appreciate it. Of course the Supervisor/Manager needs to reassure the physician that the physician is the one making the decisions, and is not meant to be an absolute directive.

WorkCare is developing an introduction letter that can be provided to physicians that will help in these communications.

- “Map” the route to the clinic and hospital by driving the route as part of site mobilization.

What Do I Do in an Emergency Situation?

- Call 911 or your local emergency responder for initial employee evaluation and transport to the hospital. **A designated SES-TECH employee should always accompany the injured worker to the hospital.**
- Administer first aid to minimize the injury effects
- Call WorkCare at 800-455-6155 for a triage call/discussion with an Occupational Health Nurse or physician. Please mention as soon as possible that the call is regarding an emergency injury. At this point, the Occupational Health Nurse/physician will assist the supervisor to determine the best treatment plan.
- Provide the following information to WorkCare:
 - Name of supervisor calling
 - Phone number
 - Location calling from
 - Name of individual injured, social security number
 - Date and type of injury
- During WorkCare off-hours, dial the 800 number and identify yourself. A WorkCare health care representative will call you back shortly. **Do not delay treatment while awaiting a return phone call.**
- Call your PESH (*fill in his/her name and phone number*)
- Call your Project Manager (*fill in his/her name and phone number*)
- Call your Program Manager (*fill in his/her name and phone number*)

What Do I Do in a Non-Emergency Situation?

- Administer first aid as soon as possible to minimize the injury effects
- Call WorkCare at 800-455-6155 for a triage call/discussion with an Occupational Health Nurse or physician. Please mention as soon as possible that the call is regarding an injury. At this point, the Occupational Health Nurse/physician will assist the supervisor to determine the best treatment plan.
- Provide the following information to WorkCare:
 - Name of supervisor calling
 - Phone number
 - Location calling from
 - Name of individual injured, social security number
 - Date and type of injury
- During WorkCare off-hours, dial the 800 number and identify yourself. A WorkCare health care representative will call you back shortly. **Do not delay treatment while awaiting a return phone call.**
- Call your PESH (*fill in his/her name and phone number*)
- Call your Project Manager (*fill in his/her name and phone number*)
- Call your Program Manager (*fill in his/her name and phone number*)
- Call your local Workcare clinic (*fill in their phone number*) to notify them that you are bringing an injured worker to their clinic for evaluation.
- You may transport the injured employee to the local clinic in a privately owned vehicle. **A designated SES-TECH employee must accompany the injured worker to the local clinic.**
- Encourage the clinic, with WorkCare support, to consider first aid measures first.

What is Considered an Emergency?

When deciding which of the two medical facilities (discussed above) to use for medical treatment, draw upon your first aid training/handbooks, past experience, or advice from a PESM or from a licensed health care professional; using your best judgment may prove most valuable.

Some physical signs/symptoms that require emergency medical treatment and a call to 911/ambulance service is provided.

- Chest pain
- Difficulty breathing
- Uncontrolled bleeding
- Bone fracture
- Loss of consciousness
- Severe head injury
- Poisoning
- Shock
- Loss of limb
- Sudden and prolonged dizziness

What Actions Do I Take after an Injury?

- Obtain treatment and medical release records for the injured worker and forward to WorkCare.
- Contact PESM who will contact workers
- Seek ways to ensure the worker can work, including alternate work. Prompt return to work is crucial for successful case management.
- Regularly follow-up with WorkCare.

Near Miss and Quality Incident Reports are great ways to contribute to our ESQ Programs. Communicating our Lessons Learned can result in the continuous improvement necessary for achieving ZERO INCIDENT PERFORMANCESM and Client Service Quality[®] and generating Very Satisfied Clients!

“Working Toward Zero Incident Performance Through Planning, Tasking, and Error-Free Execution”

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APPENDIX H
SAFETY BRIEFING SHEET

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DAILY BRIEFING SIGN-IN SHEET

Date: _____ Project Name/Number/Location: Oceana Salvage Yard NTCRA

Shift/Department: _____ Person Conducting Briefing: _____

1. AWARENESS (e.g., special EHS concerns, pollution prevention, recent incidents, etc.):

2. OTHER ISSUES (EHS Plan changes, attendee comments, etc.):

3. ATTENDEES (Print Name):

1.	21.
2.	22.
3.	23.
4.	24.
5.	25.
6.	26.
7.	27.
8.	28.
9.	29.
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20.	40.

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APPENDIX I

WEEKLY AND MONTHLY HEALTH AND SAFETY REPORT FORMS

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WEEKLY HEALTH AND SAFETY REPORT

Project Name: _____																														
Location: _____																														
SITE INFORMATION Week Ending _____ Hours Worked : Craft: _____ PS: _____ Subs: _____ Level of Protection For the Week: B __ C __ D __	INJURIES AND ILLNESSES Yes _____ No _____ Describe: _____ _____ _____ _____																													
MAJOR ACTIVITIES CONDUCTED THIS WEEK: (Drum handling, sampling, excavation, abatement/T&D, etc.) _____ _____																														
SIGNIFICANT EVENTS THIS WEEK: (regulatory visits, equipment malfunctions, process start-up or shutdown): _____ _____																														
FUTURE ISSUES: (schedule, manpower allocation, monitoring equipment, other resources needed) _____ _____ _____																														
SITE AUDIT/INSPECTIONS CONDUCTED Yes _____ No _____ (describe outstanding findings and attach results) _____ _____ _____																														
HIPO ACTIVITIES <table style="width: 100%; border: none;"> <tr> <td style="width: 35%;">Hot Work</td> <td style="width: 15%;">Yes _____</td> <td style="width: 15%;">No _____</td> <td style="width: 35%;">Dates: _____</td> </tr> <tr> <td>Lockout/Tagout</td> <td>Yes _____</td> <td>No _____</td> <td>Dates: _____</td> </tr> <tr> <td>Confined Space Entry</td> <td>Yes _____</td> <td>No _____</td> <td>Dates: _____</td> </tr> <tr> <td>Soils Analysis Classification</td> <td>Yes _____</td> <td>No _____</td> <td>Dates: _____</td> </tr> <tr> <td>Excavation Daily Check List</td> <td>Yes _____</td> <td>No _____</td> <td>Dates: _____</td> </tr> <tr> <td>Crane On-Site</td> <td>Yes _____</td> <td>No _____</td> <td>Dates: _____</td> </tr> <tr> <td>Critical Lift Plan Performed</td> <td>Yes _____</td> <td>No _____</td> <td>Dates: _____</td> </tr> </table>			Hot Work	Yes _____	No _____	Dates: _____	Lockout/Tagout	Yes _____	No _____	Dates: _____	Confined Space Entry	Yes _____	No _____	Dates: _____	Soils Analysis Classification	Yes _____	No _____	Dates: _____	Excavation Daily Check List	Yes _____	No _____	Dates: _____	Crane On-Site	Yes _____	No _____	Dates: _____	Critical Lift Plan Performed	Yes _____	No _____	Dates: _____
Hot Work	Yes _____	No _____	Dates: _____																											
Lockout/Tagout	Yes _____	No _____	Dates: _____																											
Confined Space Entry	Yes _____	No _____	Dates: _____																											
Soils Analysis Classification	Yes _____	No _____	Dates: _____																											
Excavation Daily Check List	Yes _____	No _____	Dates: _____																											
Crane On-Site	Yes _____	No _____	Dates: _____																											
Critical Lift Plan Performed	Yes _____	No _____	Dates: _____																											

AIR MONITORING:

Real Time

Major Activity	Location(s)	Worker Occupation	FID/PID Range	CGI/O2 Range	PDM Range	Other

PERSONAL AIR MONITORING

Analyte	Activity Monitored	Occupation	Location	Result	Type of Sample*

SUBCONTRACTORS ON SITE

Company Name	Task or Function	Return to Site Next Week (Y/N)

Health and Safety Officer - Signature

Date

EHS WEEKLY/MONTHLY CHECKLIST AND ACTION ITEM REPORT

Inspection Type: Weekly Monthly

Project/Location:	Inspector/s:	Time/Date:
TOPIC	OBSERVATIONS	FINDING (Y/N)

Work Conditions		
1. Housekeeping		
2. Walking/Working Surfaces		
3. Aisles and Passageways		
4. Platforms/Scaffolding		
5. Ladders		
6. Stairs, Guardrails, Toe-boards		
7. Exits/Egress		
8. Roadways		
9. Ventilation		
10. Lighting		
11. Noise Exposure		
12. Ergonomics (EHS 3-1, Attachment B)		
13. Site Perimeter and Control Zones Identified		
Equipment		
14. Hand/Portable Tool Condition, Storage and Use		
15. Machine, Conditions/Guarding		
16. Mobile/Heavy Equipment a. Physical inspection of equipment b. Review of daily inspection reports c. Review of equipment deficiency corrections logs/records		
Material Handling Equipment		
17. Hoisting and Rigging		
18. Lifting Aids Used When Possible		
19. Proper Lifting Techniques Used		
Electrical Safety		
20. Power Cords		
21. GFCI		
22. Generators		
23. Breaker Box Access/Clearance		

EHS WEEKLY/MONTHLY CHECKLIST AND ACTION ITEM REPORT

Inspection Type: Weekly Monthly

Project/Location:	Inspector/s:	Time/Date:
TOPIC	OBSERVATIONS	FINDING (Y/N)

Hazardous Materials		
24. Hazardous Chemical List Current		
25. MSDS		
26. Labeling		
27. Signs/Postings/Color Coding		
28. Proper Storage and Segregation of Hazardous Materials		
29. Compressed Gas Storage and Use		
Emergency Systems		
30. Emergency phone numbers posted		
31. Evacuation routes, rally points shown on site map		
32. Fire extinguishers inspected monthly		
33. Eyewashes and showers periodically inspected, units flushed, and fluids periodically changed		
34. First Aid Kits/Stations		
35. Emergency Rescue Equipment		
Protective Equipment		
36. PPE used, stored, and maintained in accordance with EHS plan		
37. Respirator use, storage, and maintenance		
Hazardous Waste Storage Area(s)/Satellite Accumulation Area		
38. Designated, secured area with "Hazardous Waste" signage. For SAA area is marked "SAA". (SAA)		
39. Containers:		
a. DOT-spec. containers (for wastes to go off-site only)		
b. Intact/in good condition		
c. Waste compatible with containers (e.g., no evidence of corrosion, softening, bulging) (SAA)		
d. Marked "Hazardous Waste"/		

EHS WEEKLY/MONTHLY CHECKLIST AND ACTION ITEM REPORT

Inspection Type: Weekly Monthly

Project/Location:	Inspector/s:	Time/Date:
TOPIC	OBSERVATIONS	FINDING (Y/N)

visible Accumulation Date. <i>For SAA, marked "Hazardous Waste"</i>		
e. Securely closed and stored to prevent rupture/leaking, except when add/remove waste. (SAA)		
f. For SAA only, Stored "at the point of generation" and meets quantity limits (Federal: 55 gal; check state requirements).		
40. Reactive/ignitable wastes stored at least fifty (50) feet from property.		
41. Liquid wastes within secondary containment (BMP, check WMP to determine state requirements).		
42. Incompatible wastes separated by a dike, wall, berm or other device.		
43. Stored for less than 90 days. <i>(CERCLA projects may have storage variance).¹</i>		
44. Container tracking log accurately reflects containers stored. (SAA)		
45. Area maintained in an orderly fashion and complies with state/EHS plan requirements. (e.g. good housekeeping, adequate aisle space)		
Hazardous Waste Tank Storage Area		
46. Daily written inspection is being conducted and is maintained on site. Inspections include: a. Overfill/spill control b. Aboveground points of tank; monitoring/leak detection c. Surrounding area Cathodic protection systems are inspected bimonthly (& 6 months after installation)		
Waste/Stockpiles		

¹ If stored on-site 75 or more days, TSDF/transporter has been selected (EHS 1-4), pick-up date scheduled and PM/PESM are aware of 90-day limit.

EHS WEEKLY/MONTHLY CHECKLIST AND ACTION ITEM REPORT

Inspection Type: Weekly Monthly

Project/Location:	Inspector/s:	Time/Date:
TOPIC	OBSERVATIONS	FINDING (Y/N)

47. Refer to: a. Attachment C – Hazardous Waste Less Than 90 Days For Hazardous Waste Stockpiles; b. Attachment C – Solid Waste For State Regulated/Non-Hazardous Stockpiles; and/or c. Attachment C – PCB for PCB Stockpiles, if applicable		
TSCA PCB Wastes		
48. Inspected every 30 days at a minimum. Refer to PESH PCB Checklist		
Point Source Discharges		
49. Permit conditions are being met.		
50. Monitoring equipment is fully operational.		
51. Equipment calibrations and maintenance is up-to-date.		
52. Discharge sampling performed at required intervals.		
53. Review monitoring results (<i>Report permit exceedences per EHS 1-7</i>)		
54. DMR and Plant Logs properly completed, signed, and submitted (if required).		
55. Fugitive Dust – Appropriate BMPs are instituted for fugitive dust emissions.		
Stormwater and other NPDES Discharge Activities		
56. SWPPP reflects current activities and has been updated as necessary.		
57. BMPs in SWPPP/Soil Plan implemented.		
58. Visual observations indicate stormwater meets water quality criteria.		
59. Stormwater BMP inspections conducted and documented as		

EHS WEEKLY/MONTHLY CHECKLIST AND ACTION ITEM REPORT

Inspection Type: Weekly Monthly

Project/Location:	Inspector/s:	Time/Date:
TOPIC	OBSERVATIONS	FINDING (Y/N)

Review previous week's/month's Action Item Report. Carry forward action items that have not been implemented. Note outstanding action items with an (F) in the "Action Item" column on this report. Note an (F) in the "Date Completed" column on previous week's/month's Action Item Report.

Project:

Area of Inspection:

Inspection Type: Weekly Monthly

Date of Inspection:

ACTION ITEM	RESPONSIBLE PARTY	SCHEDULE	DATE COMPLETED
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			

Reviewed by: _____

Site Superintendent

_____ Date

cc: *Project Manager (monthly only)*

PESM (monthly only)

Attachment B

SES-TECH Corporate Safety and Health Policies

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Environmental Safety and Quality Policy



Tetra Tech EC, Inc. (TtEC) is committed to ensuring the health, safety, and well being of our employees and the communities in which we work, enhancing and protecting the environment, and providing quality services to our clients. Our Environmental, Safety and Quality (ESQ) Policy provides the framework and underlying principles for our Environmental Management System and is an integral part of how we conduct business.

All TtEC associates have the right to work in a safe and healthful workplace as well as the responsibility to help create and work in a safe and environmentally protective manner:

- We will complete our work successfully, with a great deal of attention to health and safety by:
 - Incorporating pollution prevention and loss prevention principles into our work process.
 - Employing well-trained personnel who understand and have the knowledge to fulfill their ESQ responsibilities.
- We will fully comply with all laws and regulations pertaining to our business, as well as, company policies and procedures
- We will commit ourselves to complying with the terms of our contracts and to meeting the four project objectives—knowing scope, budget, schedule, and level of quality.
- We will provide the level of quality our internal and external clients expect and pay for and use its attainment as our measure of success.
- We will safely and properly plan our work and work our plan.
- We will communicate and document the execution of our work.
- We will gather data and make decisions inclusively and involve employees and others affected by ESQ decisions inclusively.
- We will dedicate ourselves to continuous improvement by:
 - Establishing and periodically updating ESQ improvement objectives and targets.
 - Recognizing outstanding employee and project ESQ performance.

These commitments are defined in, and are fundamental to, our Client Service Quality[®], Do It Right[®], and Shared Vision[®], Zero Incident Performance[®] operating philosophies.



TETRA TECH EC, INC.

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Corporate Health and Safety Program Procedures List

PO-1:	Project Management Planning
EHS 1-4:	Subcontractor Selection and Management
EHS 1-7:	Incident Reporting and Investigation
EHS 1-11:	Training
EHS 3-2:	EHS Plans
EHS 3-15:	Underground Utilities
EHS 4-2:	Hazard Communication and Training
EHS 4-5:	Medical Surveillance
EHS 4-6:	Temperature Extremes
EHS 5-1;	Personal Protective Equipment
EHS 5-2	Respiratory Protection
EHS 6-3:	Excavation and Trenching
PP-14:	Substance Abuse Program

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Zero Incident Performance®



We value the safety and well being of all associates. We work on the premise that all accidents are preventable. Our goal of Zero Incident Performance® is supported by the integration of safety concepts, principles and practices into each work effort and project phase.

Zero Incident Performance®
zip

Do it safe... Do it right



TETRA TECH EC, INC.

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Zero Incident Performance[®] Pledge

*As a member of the Tetra Tech EC, Inc. Team,
I am dedicated to the goal of Zero Incident Performance:*

- **I believe that all incidents are preventable.**
- **I believe that Zero Incident Performance is achievable through proper planning, tasking, and execution of plans and procedures as written.**
- **I believe that the investigation of “near misses” provides an opportunity for improvement before a loss occurs.**
- **I will make every effort to understand how to properly perform each task that I am assigned.**
- **I will perform each task in a safe and environmentally protective manner with the appropriate level of quality.**
- **I will help to fix things that are wrong.**
- **I will immediately report all incidents including “near misses” to my supervisor.**



TETRA TECH EC, INC.

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Attachment C

SES-TECH Corporate Procedures Referenced in APP

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Corporate Health and Safety Program Procedures List

- PO-1: Project Management Planning
- EHS 1-4: Subcontractor Selection and Management
- EHS 1-7: Incident Reporting and Investigation
- EHS 1-11: Training
- EHS 3-2: EHS Plans
- EHS 3-15: Underground Utilities
- EHS 4-2: Hazard Communication and Training
- EHS 4-5: Medical Surveillance
- EHS 4-6: Temperature Extremes
- EHS 5-1: Personal Protective Equipment
- EHS 5-2: Respiratory Protection
- EHS 6-3: Excavation and Trenching
- PP-14: Substance Abuse Program

PO-1 : Project Management Planning

Last Revision By: Kennedy Lugo on

04/29/2011

Created By: Nicole Bush on 07/09/2009

Purpose:	The purpose of this procedure is to define the minimum requirements for project management planning to meet the four project objectives of: Scope, Schedule, Budget, and Level of Quality. This procedure also defines the minimum qualifications to be a Project Manager and summarizes the requirements for transferring a project to a new Project Manager.		
Version Date:	04/28/2011 - Revised	Original Issue Date:	09/01/95
Category:	Company Procedures	Sections:	Project Initiation/Operations
Sub Category:	Project Initiation/Operations	Document Type:	Procedure
Keyword Index:	Operational Control, Work Plans	Document Owner:	John DeFeis
Approved By:			

▼ **Table of Contents**

See Below

▼ **1.0 PURPOSE**

The purpose of this procedure is to define the minimum requirements for project management planning to meet the four project objectives of:

- Scope
- Schedule
- Budget
- Level of Quality

This procedure also defines the minimum qualifications to be a Project Manager and summarizes the requirements for transferring a project to a new Project Manager.

▼ **2.0 SCOPE**

This procedure applies to all Tetra Tech EC, Inc. (TtEC) projects.

▼ **3.0 MINIMUM REQUIREMENTS**▼ **3.1 Responsibilities**▼ **3.1.1 Project Managers**

The Project Manager is responsible for overall management of a project and for ensuring that the four project objectives are met in a manner consistent with our Environmental Safety and Quality (ESQ) requirements.

The Project Manager is responsible for planning and implementing the project based on the TtEC Mission Statement, philosophies, and policies and this procedure. The Project Manager must ensure that appropriate personnel are included in the preparation and review of contract documents and work plans, approving work plans, and obtaining client approval when required.

▼ **3.1.2 Project Manager's Supervisor**

The Project Manager's direct operational supervisor (e.g. Consulting and Engineering [C&E] Operations Manager for C&E projects; or Director of Commercial Remediation or Major Program Manager for remediation

projects) shall determine the adequacy of the peer review requirements of planning documents, including work plans. The Project Manager's Supervisor shall also ensure that the Project Manager meets the minimum qualifications or for approving variations from the minimum qualifications. In addition, the Project Manager's Supervisor shall approve the transfer of project responsibility to a new Project Manager.

For C&E projects, the Operations Manager is responsible for:

- a. Approving the use of the Streamlined Work Plan Form (Attachment 1)
- b. Risk ranking C&E projects and providing an appropriate level of project oversight.

▼ 3.1.3 All Employees

Each employee is expected to request permission to vary from minimum requirements whenever minimum requirements do not fit the implementation of our Operating Philosophies. Permission to vary must be obtained from the Discipline Lead and documented using the Quality Rule (Corporate Reference Library [CRL] Philosophies Section). Project-related deviations must be covered at the first project review following the authorization to deviate.

▼ 3.2 Minimum Qualifications of Project Managers

Project Managers shall have the following minimum qualifications, education, and experience:

- a. Loss Control Study Course (current enrollment is acceptable provided it is completed within 3 months of enrollment).
- b. Complete Project Management Training Level 101 - PM 101
- c. Project Management Training 201 Level (PM-201) training.
- d. Previous technical and management experience appropriate to the scope of work to be performed.
- e. Technical training and/or experience in compliance with contract requirements.

The Project Manager's direct operational supervisor may establish additional requirements or approve variance from the minimum requirements. The rationale for the variance shall be documented in the project file.

▼ 3.3 Minimum Project Requirements

All projects shall complete the following activities and include the documentation in the project file:

- a. Task Initiation Procedure (TIP)/Risk Management Plan (RMP) (CRL Procedure PO-2)
- b. Fully executed contract.
- c. Project charge number
- d. Contract Notice Checklist (CRL Procedure PO-5).
- e. Project Readiness Review Meeting (Attachment 2)
- f. Client Kickoff Meeting (Attachment 3)
- g. Peer-reviewed work plan or Streamlined Project Work Plan Form (Attachment 1) [and subsequent revisions](#).

Project documentation is maintained in accordance with CRL Procedure PO-8.

▼ 3.4 Variances from TtEC Procedures

Variances from TtEC procedures, such as might be required to conform to a client's program in accordance with contract requirements, will be implemented and documented using the Quality Rule (CRL Philosophies Section) or the specific requirements of that procedure - if stated.

▼ 3.5 Transfer of Project Management Responsibilities

If a change of the Project Manager is required during the execution of the project, the new Project Manager will discuss each item on the Transfer of Project Manager Checklist (Attachment 4) with his direct operational supervisor. This discussion will establish the baseline for the new Project Manager's performance. The

completed checklist will document this discussion and should be retained in the project file.

The Project Manager's direct operational supervisor is responsible for approving the transfer of project responsibility to a new Project Manager.

▼ 4.0 GUIDANCE

Further guidance on project management planning and implementation can be found in the Project Management Training Introductory Module Manual (PM-101), Project Management Training 201 Level Manual (PM-201), Project Management Training 301 Level Manual (PM-301), and project operations guidance documents located on the CRL.

▼ 4.1. Guidance for Minimum Requirements for Project Managers

The Project Manager's direct operational supervisor may approve variances from the minimum qualification requirements. Some factors that may be considered include:

- a. Level of education, years of experience, or completion of similar training courses.
- b. Availability of PM-201 training courses.
- c. Experience and training of support staff.
- d. Level of required supervisory involvement based on Situational Leadership II, Diagnosing Development Level.

▼ 4.2 Guidance for Minimum Project Requirements

Additional guidance for each of the project minimum requirements items can be found in CRL under the Work Practices, Guidance Document PG-3, Project Management-Implementation.

A graded approach to low-risk C&E projects (see Attachment 5) may be applied to meet the minimum requirements of this procedure as determined by the Operations Manager. The Operations Manager may:

- a. Provide guidance to the Project Manager on the application of the graded approach and document the graded approach level.
- b. Approve the Streamlined Work Plan Form and Project Planner (Attachments 1 and 6).

The Project Planner (Attachment 6) is a reference tool that can be used to document the assignment of responsibility and status of achieving the minimum requirements of this procedure. The Project Planner also lists the procedures needed for implementation (those procedures that are the responsibility of the Project Manager) and some of the discipline procedures for reference. The Planner highlights some of the specific criteria for each requirement and guidance to achieving them.

▼ 4.3 Definitions

Risk Management Plan - The RMP defines the project risks and the mitigating actions to control that risk. The RMP is developed through the TIP form, which is described in CRL Procedure PO-2. Any changes in the project scope or conditions need to be reviewed relative to those used to develop the TIP/RMP to determine whether revisions are needed and additional approval is required.

Fully Executed Contract - A fully executed contract is one that has been signed by both the client and TTEC. All contracts require legal review to identify variances from acceptable terms and conditions and to establish the bases of the RMP. This review process is an integral part of the TIP (CRL Procedure PO-2). If a client makes any changes to a contract, prior to signing that contract, the Legal Department should review the entire final contract to ensure that the agreed changes were properly made and no other changes appear.

Project Charge Number - Establishing the project charge number prior to starting work reduces the need for time charge adjustments and the possibility of disclosure statement breeches and helps to ensure that all the appropriate project planning and documentation are done. The process for establishing a project charge number is defined in CRL Procedure AF-2, Billing and Project Initiation. The Service Cost Engineers (SCEs) or other Project Services staff can initiate this process for the Project Manager.

Contract Notice Checklist - A document that identifies the contractual notice requirements for funding limitations, change notices, claims, disputes, time extensions, delays, releases/spill or violation of permits, etc.

Project Readiness Review (PRR) Meeting - The purpose of the PRR meeting is to provide the key project staff with the information necessary to efficiently initiate and execute the project. An example of a PRR agenda and checklist is provided in Attachment 2. The PRR meeting should be scaled to the size of the job. For a large project, a formal meeting may be appropriate. For a small project, the PRR may be as simple as a documented phone call/s. Use of Attachment 2, Sample Project Readiness Review Checklist, ensures that all 11 project management planning elements have been considered. Additional discussion is presented in Guidance Document PG-3, Project Management-Implementation, Section 4.2.8.

Client Kickoff Meeting - The client kickoff meeting should be conducted with the client and the key project staff and done prior to the finalization of the Work Plans. It is crucial to the success of the project to obtain concurrence or "buy-in" on our interpretation of the scope of work, procedures, and anticipated quality of deliverables and service. The Client Kickoff meeting should be scaled to the size of the job. An example of a Client Kickoff meeting agenda is provided in Attachment 3. Additional discussion is presented in Guidance Document PG-3, Project Management-Implementation, Section 4.2.9.

Peer-Reviewed Work Plans - Work Plans should adequately address each of the 11 project management planning elements (discussed in the PM-200 training and PG-3, Project Management-Implementation). This can range from a full, stand-alone document to a simple statement on the Project Planner (Attachment 6) depending on the complexity of the project.

11 Project Planning Elements - Fundamental planning elements must be considered and defined during the planning phases of a project. The detail and level of effort in developing these fundamental plans will in large part be determined by the magnitude and complexity of the project. Additional discussion is presented in Guidance Document PG-3, Project Management-Implementation, Section 4.3.

▼ **4.4 Transfer of Project Management Responsibilities**

During the execution of a project, it may become necessary to change Project Managers. The transfer of responsibility from the incumbent Project Manager to the new Project Manager needs to be planned and conducted in a formal manner. The new Project Manager needs to assess the status of the project relative to its four project objectives and establish the baseline for accepting the transfer of responsibility. The new Project Manager's direct operational supervisor will review the project status and discuss the formal transfer of responsibility using the Transfer of Project Manager Checklist (Attachment 4). This form will also be used to document this discussion.

The new Project Manager shall conduct an assessment within a reasonable time period (typically 2 weeks but possibly longer for very large or complex projects) and identify any issues/concerns with the existing budget. For design/build projects, this assessment shall be conducted by meeting with the Project Engineer and the Lead Estimator. If no issues/concerns are identified, it is then assumed that the new Project Manager concurs with the existing four project objectives.

▼ **5.0 REFERENCES**

Please Describe Reference Here	Place Link In This Column
1. Code of Ethical Conduct	
2. ESQ Policy	
3. Corporate Organizational Charts	
4. PG-3, Project Management Implementation	
5. PO-2, Task Initiation (TIP)	
6. PO-5, Contract Notice Checklist	
7. PO-8, Document Control	
8. TtEC Mission Statement	

6.0 ATTACHMENTS

Please Provide a Description of the Attachment	Place Attachments Here
1. Streamlined Project Work Plan Form	 PO-1, Attachment 1, August 2008.doc
2. Sample Project Readiness Review Agenda and Checklist	 PO-1, Attachment 2 January 2011.doc
3. Sample Client Kickoff Agenda	 PO-1, Attachment 3 March '05.doc
4. Transfer of Project Manager Checklist	 PO-1, NEW Attachment 4.doc
5. Risk Ranking of C&E Projects and Graded Approach for Implementation of PO-1	 PO-1, NEW Attachment 5.doc
6. TtECProject Planner	 PO-1, NEW Attachment 6.doc
7.	
8.	
9.	

Tetra Tech EC, Inc.

NOTICE OF OWNERSHIP AND CONDITIONS OF USE

This document is the property of Tetra Tech EC, Inc. (TtEC) and is to be used only for the duration and connection with the performance of work for TtEC. Written deviations to this document may be authorized when appropriate in accordance with the Quality Rule. This document is not to be construed as an employment contract or any binding obligation of TtEC. This document may be modified or rescinded at any time with or without prior notice at the sole discretion of TtEC. Hard copies of this document may not contain the most current information. The current version of this document can be found on the TtEC online Corporate Reference Library.
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2000, 2001, 2002, 2003, 2004

Tetra Tech EC, Inc.

Proprietary Information

1. PROJECT IDENTIFICATION

Project Name:	
Client:	
Charge Number:	

STREAMLINED PROJECT WORK PLAN FORM

Our commitment at Tetra Tech EC, Inc. is to plan and implement every project in a manner that is consistent with our Mission Statement, ESQ policy, Code of Ethical Conduct, and the operating philosophies of Client Service Quality[®], Do It Right[®], and Shared Vision[®].

Complete this form, [have it reviewed and approved, distribute among project personnel](#), and place in the project file.

Background and Location (add pages if required):

2. SCOPE, TASK DESCRIPTIONS, [AND ROLES, RESPONSIBILITIES & AUTHORITIES](#) (add pages if required):

Task 1:

Task 2:

Task 3:

3. IMPLEMENTATION PLAN/SCHEDULE/WBS (add pages if required):

Activity	Completion Date	WBS

4. OTHER MANAGEMENT APPROACHES (attach completed Project Planner or reference other stand-alone plans):

Attachments include:

5. REFERENCE RELEVANT PROCEDURES ([CRL, Regulatory, Statutory, Client, and/or Program or Project-specific](#))

(add pages if required or attach completed Project Planner):

Project Planner is attached: Yes No

Relevant procedures include:

6. APPROVALS

Name of Project Manager:	Signature of Project Manager:	Date:
Name of Peer Reviewer:	Signature of Peer Reviewer:	Date:

Tetra Tech EC, Inc.	
Procedure Number: PO-1, Project Management Planning, Attachment 2	Form Version Date: January 2011
Project Name/Number:	Insert Project Name/Number Here
Date Project PRR Conducted:	Insert Date of PRR Here

Sample Project Readiness Review Agenda and Checklist

- 1. Identify and Introduce All Team Members and Roles**
- 2. Four Project Objectives and Project Planning Elements**
 - a. Scope
 - i. Work Plan
 - ii. Risk Management Plan
 - iii. EHS Plan
 - iv. Procurement, as applicable
 - b. Level of Quality
 - i. Quality goals, objectives and measures
 - ii. QA/QC Plan
 - iii. Status and Monitoring Plan
 - iv. Communications Plan
 - v. Documentation Plan
 - vi. Obtaining, distribution and incorporation of client documents into plans
 - c. Schedule
 - i. Key Dates
 - ii. Project Controls
 - d. Budget
 - i. Cash Management Process
 - ii. Staffing Plan
 - iii. Task hours/dollars for each discipline/participant
- 3. Contract Management**
 - a. Change Management and forecasting
 - b. Team to identify all changes to PM

Tetra Tech EC, Inc.	
Procedure Number: PO-1, Project Management Planning, Attachment 2	Form Version Date: January 2011
Project Name/Number:	Insert Project Name/Number Here
Date Project PRR Conducted:	Insert Date of PRR Here

Sample Project Readiness Review Checklist		
	Task	Assigned To
1.0	Introduce Team and Roles	
2.0	Project Objectives and Project Planning Elements	
2.a	Scope	
	2.a.i Work Plan	
	a. Go over key issues, including Identify project-specific training programs	
	b. Plan for project technical closeout	
	2.a.ii Risk Management Plan	
	a. Identify project risks	
	b. Review RMP and mitigations	
	c. Discuss how the team will Monitor Project Risk	
	d. Update TIP as necessary for any modifications	
	e. Review Regulatory Compliance Plan	
	f. Review Waste Management Plan (as appropriate)	
	2.a.iii EHS Plan	
	a. Develop project H&S Plan	
	b. Discuss the benefit of incident reports including near miss reports	
	c. Establish H&S training programs, as applicable	
	d. Identify and plan for project staff H&S certification documentation requirements and renewals	
	e. Coordinate medical monitoring, as appropriate	
	f. Plan for H&S file closeout	
	2.a.iv Procurement	
	a. Develop procurement plan	
	b. Develop and manage property control plan	
	c. Develop Small Business Subcontracting Plan	
	d. Plan for the review the form and periodicity for subcontractor invoices	
	Plan for subcontractor closeout	
2.b	Level of Quality	
	2.b.i Quality Goals, Objectives and Measures	
	2.b.ii QA/QC Plan	
	a. Develop project QA/QC plan	
	b. Schedule project audits, technical reviews, and project reviews	
	c. Arrange/facilitate project audits and reviews	
	2.b.iii Status and Monitoring Plan	
	a. Develop Status and Monitoring Plan	
	b. Plan to track key project drivers that can cause change in budget or schedule	
	c. Others, as identified (identify below) for staffing	

Tetra Tech EC, Inc.	
Procedure Number: PO-1, Project Management Planning, Attachment 2	Form Version Date: January 2011
Project Name/Number:	Insert Project Name/Number Here
Date Project PRR Conducted:	Insert Date of PRR Here

Sample Project Readiness Review Checklist			
	Task	Assigned To	Date Due
	needs		
	2.b.iv Communications Plan		
	a. Establish communications requirements in Communications Plan		
	b. Prepare "Notice" requirements memoranda		
	c. Develop partnering process, as applicable		
	2.b.v Documentation Plan		
	a. Create Documentation Plan		
	b. Develop formats for correspondence, minutes, work plans, etc. to maintain project identification and traceability.		
	c. Establish project filing system & location Identify hard-copy and electronic record location/path and custodian (ftp sites or office/project servers)		
	d. Establish routing of project documentation Identify electronic document/record access Identify electronic read/write access Identify project document distribution lists		
	e. Plan for project file closeout Identify project record retention periods Identify final project record disposal		
	2.b.vi Obtaining, distribution and incorporation of client documents into plans		
	2.c Schedule		
	i. Develop/maintain project schedule		
	ii. Develop Project controls Plan		
	2.d Budget		
	i. Develop the cash management plan		
	ii. Discuss Invoice formatting and processing requirements		
	iii. Develop a plan to monitor accounts receivables		
	iv. Develop a plan to assist and participate in Award Fee presentations (for CPAF projects)		
	v. Develop plan to review draft invoices		
	3.0 Contract Management		
	i. Discuss a summary contract review		
	ii. Discuss the Contract Notice Checklist, including contacts		
	iii. Develop a plan to Monitor contract compliance		
	iv. Establish contract filing system		
	v. Develop a plan to Identify contract changes		
	vi. Develop a plan to manage change modifications and claims documentation		
	vii. Coordinate contract closeout		
	3.a Change Management		

Tetra Tech EC, Inc.	
Procedure Number: PO-1, Project Management Planning, Attachment 2	Form Version Date: January 2011
Project Name/Number:	Insert Project Name/Number Here
Date Project PRR Conducted:	Insert Date of PRR Here

Sample Project Readiness Review Checklist			
	Task	Assigned To	Date Due
	i. Discuss how the team will Identify changes, provide client notifications		
3.b	Team to Identify All Changes to PM		

Project Name/Number: [Insert Project Name/Number Here](#)

SAMPLE CLIENT KICKOFF AGENDA

1. Introduce Team Members and Roles

- a. Organization charts for both TtEC and the client's organization
- b. List of telephone numbers for key project members

2. Four Project Objectives & Project Planning Elements

- a. Scope of Work
 - i. Work Plan
 - ii. Risk Management Plan & Mitigations
 - iii. EHS Plan
 - iv. Procurement, if applicable
- b. Schedule
 - i. Project Controls
 - ii. Critical path schedule
 - iii. List of key dates (meetings, intermediate deadlines, deliverable dates, etc.)
- c. Level of Quality
 - i. Client expectations and criteria for successful project outcome
 - ii. QA/QC Plan
 - iii. Quality goals, objectives & measures
 - iv. Status & Monitoring Plan
 - v. Communication Plan
 - 1. Frequency and type of communications/contact/distribution
 - 2. Confidentiality requirements
 - vi. Documentation Plan
- d. Budget
 - i. Cash Management Process
 - 1. Project cost and potential cash flow
 - 2. Invoice format and back-up documentation
 - ii. Staffing Plan
 - iii. Task hours

3. Contract Management

- a. Change Management
- b. Change Order Process
- c. PM to advise the client that **Project Team will provide client** early notification of any potential changes.

TRANSFER OF PROJECT MANAGER CHECKLIST

The new Project Manager shall discuss with the incumbent Project Manager the following elements and check each item to indicate that the item has been fully reviewed. Each planning element is discussed in Procedure PG-3, Project Management, Implementation. Boxes may be double-clicked for electronic completion.

PROJECT IDENTIFICATION

Project Name:	
Client:	
Charge Number:	

CLIENT/CONTRACT

- Who are the client points of contact? Who is the decision maker? How are they organized?
- What are the client "hot buttons," key issues, and goals?
- What are client notification requirements?
- What is the period of performance and contract ceiling?
- What regulatory agencies are involved? What is their focus/concern?

WORK PLAN

- What are the elements of the scope of work?
- What procedures and guidelines are in place (Attachment 6 of PO-1)?
- What are the technology/performance Issues and how are they accounted?
- Is there a Construction Plan? Does the plan align with the four project objectives, engineering requirements, and procurement? Does it have a fully integrated mobilization plan that will get us off to a good start in the field?
- Who is the Site Superintendent?

ENVIRONMENTAL, HEALTH AND SAFETY (EHS)

- What are the EHS issues and how are they accounted for?
- What plan (EHS Plan or Incident Prevention Plan) controls fieldwork?
- How are EHS Policy commitments communicated to subcontractors and craft labor?
- How are relevant company-wide significant environmental aspects and objectives and incorporated into the work (RMP)?
- Who are the PESM and Site ESS?

RISK AWARENESS AND MANAGEMENT

- What is included in the TIP/RMP and how are mitigation measures incorporated into the work?
- Does the current version of the TIP/RMP align with existing conditions?

STATUS AND MONITORING

- What are the critical items/issues?
- Who is responsible for monitoring the critical items/issues?
- How often are the critical items/issues tracked?
- Is a written monitoring plan in place?

PROJECT CONTROLS

- What is the Work Breakdown Structure and charge number system?
- What is the baseline and current budget?
New PM shall conduct an assessment as described in Section 3.5 and identify any issues/concerns with the existing budget to their direct operational supervisor. If no issues/concerns are identified, it is then assumed that the new PM concurs with the existing budget.
- What is the baseline and current schedule?
- What change orders are pending and at what step of the six steps of change management are they?
- What is the forecasted estimate at completion? Does it align with the contract, the four project objectives (specifically "level of quality") and Client expectations?
- What tracking tools are used to monitor project costs, profit and schedule?
- Who does the monitoring and how frequently?
- What are the critical deliverables and dates?

PROCUREMENT

- What is the subcontracting strategy? Does it support our Corporate contribution goals? What team member subcontracts are in place?
- Will other services or vendors be needed?
- What are the long-lead items?
- Is this a federal government prime contract?
- What are the small business subcontracting goals?
- Is there a written Procurement Plan? Does plan correspond to and support the project schedule?

QUALITY

- What is your *Shared Vision* with your client and team regarding level of quality?
- Have you and the Client discussed contractual interpretations? How were they resolved? Are there any pending interpretations requiring resolution?
- Are internal reviews planned and budgeted?
- Is a written plan in place? Has it been peer reviewed? Does it support the current work plan?
- What are the quality control processes and procedures?

STAFFING/RESOURCE MANAGEMENT

- Have team member assignments been fulfilled?
- Have profiles and skill sets been identified for open positions?
- Are staffing commitments current and have they been communicated and agreed to with appropriate resource managers?
- Does staff have required training?
- What supplemental, or client-specific, training is needed?
- Have staff been made aware of their individual and project objectives? Has tasking and objectives been confirmed with individuals and do they align with project objectives?
- Is a written plan in place?

CASH MANAGEMENT

- Who reviews and analyzes project cost reports?
- When are invoices generated?
- Who reviews the invoice?

- Who submits the invoice?
- When will the invoice be submitted to the client?
- What is the Client's review/approval process?
- Whom do you contact if an invoice payment is late?
- When will subcontractors and vendors invoices be approved for payment?
- Who will ensure do-not-bills do not exceed approved amounts?
- How are project profit objectives monitored?

COMMUNICATIONS

- Have clear lines of communication been identified and documented between the client and the project team?
- How are meetings documented?
- How frequently are contacts planned?
- Is a written plan in place?

DOCUMENT CONTROL

- Does the project follow the document control requirement for large or small projects described in Procedure PO-6?
- Where is the project/master control file located?
- How are personal and working files managed?
- Are documents formatted in a specific manner?
- Is a written plan in place?

APPROVALS

New Project Manager:	Signature of New Project Manager:	Date:
Remediation V.P. or Designee:	Signature of V.P. or Designee:	Date:
Operations Manager	Signature of Operations Manager:	Date:

Risk Ranking of C&E Projects and Graded Approach for the Implementation of PO-1

To assist in the identification of C&E projects with high loss potential and in improving project performance, all C&E projects will be "Risk Ranked" by the responsible Operations Manager at the time of award.

The Operations Manager is to assess the risk of performance failure on a new or existing project and assign a risk ranking according to the Level 1 through Level 3 definitions provided below. Personnel competency, as described in Section 3.2 of this procedure should be considered when assigning risk level. Performance failure is defined as any error in project execution that degrades, or threatens to degrade, the baseline client relationship or planned financial performance of a project.

Depending on the Level assigned, specific actions may be required. The risk ranking may change several times during the period of performance as the project encounters different risk elements.

Level 1—High Loss Imminent. Risk of project performance failure is severe as a result of (a) project errors that have occurred in project's current or recent history and the Operations Manager has reason to suspect reoccurrence and/or (b) Project Manager/Operations Manager perceive very high risk of loss in future work scope.

Operations Manager Action: Requires frequent status and monitoring by Operations Manager. The Operations Manager and Project Manager, using three-tier planning, must identify specific risk issues and ensure a coherent strategy is in place and active at all times to reduce/minimize/eliminate losses due to performance failure. (Reference the Project Planner; Item H.4, Status and Monitoring [see Attachment 6]). The Operations Manager, Project Manager, and Director of Operations discuss Level 1 projects during monthly conference calls. Level 1 projects must be on Executive Project Review schedule.

Level 2—High Loss Potential. Project performance failure risk is high, but Operations Manager is satisfied that adequate prevention plans are in place to mitigate. However, success may require near-flawless execution by all involved. Project has high likelihood to move off track with resultant Client relationship, financial, health and safety, or other significant loss.

Operations Manager Action: Requires frequent status and monitoring by Operations Manager. The Operations Manager and Project Manager, using three-tier planning, must identify risk issues and ensure a coherent strategy is in place and active at all times to reduce/minimize/eliminate losses due to performance failure. (RMP must address perceived risks and reference the Project Planner Item H.4, Status and Monitoring [see Attachment 6]). Operations Manager and Director of Operations discuss Level 2 projects during monthly conference calls.

Level 3—Average Loss Potential. Project performance failure deemed no more than what is normally expected for work scope. Operations Manager has high degree of confidence in project team based on factors such as experience level, familiarity with work type, Client history, etc.

Operations Manager Action: Requires Operations Manager to ensure required project reviews are conducted. No additional action beyond implementation of routine work processes necessary.

Tetra Tech EC, Inc.

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TtEC Project Planner

Project Name:	Project Manager Name:	Approved By:	
Project Charge No.:	Prepared By:	Revision Dates:	
Client Contract No.:	Reviewed By:		
Project Element and References	Criteria	Assigned Responsibility	Status

A. Task Initiation Procedure (TIP)/Risk Management Plan (RMP)

PO-2 Task Initiation (TIP)*	<ul style="list-style-type: none"> The TIP/RMP is required prior to proposal submittal. The RMP must address significant environmental risks in addition to other risks identified in the TIP. The development of the TIP/RMP includes involving the appropriate disciplines (Construction, ESQ, Science, Engineering, Estimating). <p><i>Guidance: Plan ahead (minimum 48 hours) for preview and committee review.</i></p>		<p>Date TIP/RMP Approved:</p> <p>Date TIP Submittal to Legal:</p>
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B. Contract

PO-4 Work Authorization Levels PO-3 Contracting Policies and Procedures BD-10 Organizational Conflict of Interest PG-2 Project Management, Proposals and Contracts PG-5 Support Services, Contracts	<ul style="list-style-type: none"> The Legal Department must review the prime contract and any subsequent changes. Subcontracted services for other Tetra Tech companies requires an Inter-corporate Agreement Attachments 12(a) through 12(c) found in CRL Procedure PO-3. The contract must be signed before work can begin. The prime contract and any subsequent changes must be signed by a person with the appropriate signature authority. Review for conflicts of interest before accepting/bidding new contracts or task orders. <p><i>Guidance: Using the standard terms in Procedure PO-3 attachments will reduce or eliminate Legal Department review and/or negotiation steps and if agreed to will result in very favorable contracts.</i></p>		<p>Date Contract Submitted to Legal Department:</p> <p>Date Contract Signed:</p>
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* CRL procedures marked with an asterisk are identified as implementing procedures of TtEC's ISO 14001 Environmental Management System (EMS)

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Project Element and References	Criteria	Assigned Responsibility	Status
C. Project Charge Number			
AF-2 Billing and Project Initiation PG-3 Project Management–Implementation PG-5 Support Services, et al.	<ul style="list-style-type: none"> The TIP and completed contract are prerequisites for opening a charge number. The Project Initiation Form (AF-2) is used to establish a project charge number. <p><i>Guidance: Set up charge numbering system as appropriate to project complexity. Use Work Breakdown Structure (WBS) to help plan the charge numbering system.</i></p>		Project Charge Number:
D. Contract Notice Checklist			
PO-5 Contract Notice Checklists	<ul style="list-style-type: none"> The checklist must be completed prior to Project Readiness Review (PRR) Meeting. The checklist must identify each notice requirement, conditions for notice, notice recipient, special language, and contract clause citing notice requirement. At a minimum, the Project Manager must indicate how and under what circumstances the client must be notified of changes in scope, schedule, budget, or level of quality beyond original proposal or contract. These may be contained in Contract Notice Checklist. <p><i>Guidance: The checklist must be distributed to project personnel and made available to management upon request.</i></p>		Date Reviewed with Project Team:
E. Project Readiness Review (PRR)			
PG-3 Project Management–Implementation	<ul style="list-style-type: none"> An internal project team meeting is required prior to starting work. (See Agenda and Checklist in Attachment 2) The meeting minutes must be maintained in the project file. <p><i>Guidance: On small projects, the PRR may coincide with the Client Kickoff Meeting and may consist of a documented conference call.</i></p> <p><i>CRL Procedure PO-6 provides further description of the PRR objectives and discussion topics.</i></p> <p><i>Attachment 2, Sample Project Readiness Review Meeting Checklist, may also be used as a guide.</i></p>		Date of Meeting:

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Project Element and References	Criteria	Assigned Responsibility	Status
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F. Client Kickoff Meeting			
PG-3 Project Management–Implementation	<ul style="list-style-type: none"> • As appropriate, a Client Kickoff Meeting is scheduled as the initial project meeting with client and project team. (See Agenda in Attachment 3) • The meeting minutes must be maintained in the project file. <p><i>Guidance: Both the PRR and Client Kickoff Meetings are intended to occur prior to the finalization of project work plans.</i></p>		Date of Meeting:
G. Project Planning			
G-1. Work Plan			
PG-3 Project Management–Implementation PO-7 Document Review Procedure CP-4 Preparation and Control of Work Plans	<ul style="list-style-type: none"> • Primary components of the work plan are: <ol style="list-style-type: none"> 1. Description of the project background and location 2. Scope of work with task descriptions 3. Roles and responsibilities 4. Implementation plan and schedule 5. WBS 6. Management approach for the planning elements. Documented peer review per PO 3-9 and/or CP-4 as applicable • Project work plans must identify a revision date* • Scheduled conference calls, progress reports, status/monitoring reports, and telephone reports must be shown on project calendar and all records of the meetings or reports maintained in project file. Each planning element shall reference additional TtEC procedures as applicable. <p><i>Guidance: Every project requires a work plan (G.1) and RMP (Items A and G.3). An EHS Plan (G.2) is required for all field projects and site visits. Unless specified in the contract, the Project Manager determines whether the other planning elements (G.4 through G.11) are addressed in the work plan or through stand-alone plans.</i></p> <p><i>A simplified work plan (such as Streamlined Project Work Plan Form [Attachment 1] or equivalent) may be used as appropriate. Specific references to the proposal may be sufficient for planning elements. Client acceptance of the work plan may be required by contract.</i></p>		Date of Completed Work Plan:

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Project Element and References	Criteria	Assigned Responsibility	Status
G-1. Work Plan (Cont.)			
	<p><i>If a stand-alone plan is not developed for items G.4 through G.11, the Status column of this Project Planner must be used to describe how the intent of this element is being addressed. These plans must be present, as deemed appropriate by Project Manager or designee, in a (1) work plan, (2) stand-alone plan, or the (3) Project Planner (this document).</i></p> <p><i>Ensure that all quality goals, objectives, and measures are appropriately reflected in each of the relevant planning elements developed for the project, not just in the QA Plan.</i></p> <p><i>Search and review the Zero Incident Performance® (ZIP) Bulletins, Flash Reports, and Lessons Learned in the Lotus Notes database to identify documents applicable to the project.</i></p>		
G-2. Environmental Health and Safety (EHS)			
C-2 Audits* EHS 3-2 Procedures, EHS Plans EHS 3-3 Inspections* EHS 1-6 Meetings* EHS 1-7 Incident Reporting and Investigation* EHS 2-1 Emergency Preparedness*	<ul style="list-style-type: none"> EHS Plans (Health and Safety Plan, Incident Prevention Plan (IPP), or other) are required for all field projects and must be approved by EHS personnel. These plans must address the significant EHS risks specified in the RMP. Site visitors are subject to the provisions of these plans. Field projects must have PESM inspection planning. 		Date of Completed EHS Plan:
G-3. Risk Management Plan (RMP)			
PO-2 Task Initiation* PG-3 Project Management–Implementation	<ul style="list-style-type: none"> Each significant risk (contractual, environmental, health and safety, performance, technology, financial, etc.) that is identified in the RMP must be addressed in the work plan and/or the appropriate stand-alone plans. For each significant risk, the plan(s) shall identify the mitigation and monitoring requirements. The TIP and RMP must be reviewed and updated as necessary if scope changes or new risks are identified. All plans must be revised as necessary. 		Plan(s) That Address Significant RMP Risks:

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Project Element and References	Criteria	Assigned Responsibility	Status
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G-4. Status and Monitoring			
PG-3	Project Management–Implementation	<ul style="list-style-type: none"> • The contract notice requirements (see planning element D) must be addressed. 	Date of Status and Monitoring Plan:
	<ul style="list-style-type: none"> • The critical drivers that could disrupt or change the scope, schedule, budget, or level of quality, including safety and/or compliance of the project, must be identified. • For any critical activities or drivers, including those contained in the TIP/RMP, a monitoring plan should be identified and a three-tier planning approach to management identified. A three-tier plan consists of (1) assigning responsibility to track the driver, (2) assigning oversight responsibility, and (3) establishing the driver as an inspection/audit point. <p><i>Guidance: Project Controls personnel or Service Cost Engineers are available to assist with development of a status and monitoring approach.</i></p>		

Project Element and References	Criteria	Assigned Responsibility	Status
G-5. Project Controls			
PG-3 Project Management– Implementation PG-5 Project Management, Support Services, et al.	<ul style="list-style-type: none"> • As the complexity of a project increases, the PM may need to engage the support of the Project Controls Discipline Lead or local designee to assist in the preparation of a plan to address critical project performance elements. • Details of plan should be commensurate with risks in RMP and project complexity. • Track budget, schedule, and quality performance. • Identify frequency of required reports and critical deliverable dates. • Identify individual for monitoring critical performance issues/items and the monitoring frequency. • At a minimum, the Project Manager should indicate how and under what circumstances Project Controls would be notified of changes in scope, schedule, budget, or level of quality beyond original proposal or contract. <p><i>Guidance: Project Controls personnel or Service Cost Engineers are available to assist with development of a status and monitoring approach.</i></p> <p><i>In plan, indicate which tracking tools will be used to monitor costs, profit, and schedule.</i></p>		Date of Project Controls Plan:

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Project Element and References	Criteria	Assigned Responsibility	Status
G-6. Procurement			
PO-10 Contract Administration and Procurements PD-400-2 Small Business Program EHS 1-4 Subcontractor Selection and Management PG-3 Project Management–Implementation	<ul style="list-style-type: none"> • A Purchasing Agent is needed for subcontracts and procurements. • Government contracts typically require a Small Business Plan. This Procurement Plan should address small business goals. • Subcontractors need to meet minimum requirements (safety, performance, insurance, and financial viability qualifications) • Fully executed subcontracts must be completed prior to vendors start of work <p><i>Guidance: Project-specific procurement considerations should include:</i></p> <ul style="list-style-type: none"> • <i>Procurement Specialists should be used in the planning process (during proposal) to avoid delays</i> • <i>Government subcontracts should be competed; commercial client contracts are competed as appropriate.</i> • <i>Preferred sources and suppliers should be pre-qualified for quick response or mobilization.</i> 		Date of Procurement Plan:

Project Element and References	Criteria	Assigned Responsibility	Status
G-7. Quality Assurance/Quality Control			
PG-3 Project Management–Implementation QP-1 Preparation, Review and Approval of QA/QC Plans C-2 Audits*	<ul style="list-style-type: none"> • QA/QC plans should indicate how TtEC and client will measure project quality. • The minimum level of quality for all projects is defined as adherence to policies and procedures. • Specific Engineering, Scientific, Construction, and ESQ procedures applicable to the project should be identified in the work plan and/or stand-alone plans. • When the project scope requires a project-specific QA/QC plan, confer with the QA/QC Discipline Leads. <i>Guidance: Project-specific QA/QC considerations should include:</i> <ul style="list-style-type: none"> • <i>Specific data to be collected and procedures to be used.</i> • <i>Specialized training requirements.</i> • <i>Specialized subcontractor qualification requirements.</i> • <i>Scheduled inspections and/or audits/surveillances.</i> • <i>Documentation generated.</i> 		Date of QA/QC Plan(s):
G-8. Staffing/Resources			
PG-3 Project Management–Implementation AAP-1 Construction Craft 16-Step Affirmative Action Plan AAP-2 Individuals with Disabilities and Veterans Affirmative Action Plan PP-18 Employee Reporting, Hotline and Non-Retaliation*	<ul style="list-style-type: none"> • Resource Managers and/or Discipline Leads ensure staffing commitments. • Projects with more than 10 craft laborers require an EEO/Affirmative Action Plan. Consult with Discipline Leads as appropriate to project scope and complexity. • If a construction project with a craft labor component of ≥ 10 craft employees with project duration > 30 days, or any project with craft employees assigned with a project duration ≥ 3 months or more, a 16-step Affirmative Action Plan and Individuals with Disabilities and Veterans Affirmative Action Plan must be implemented. 		Date of Staff Plan:

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Project Element and References	Criteria	Assigned Responsibility	Status
G-9. Cash Management			
PG-3 Project Management–Implementation PG-5 Support Services, et al. PC-6 Cash Flow	<p>Ensure proper cash management occurs on the project:</p> <ul style="list-style-type: none"> • Complete and return draft invoices in 1 day. • Invoice immediately upon finalizing invoice. • Understand client review/approval process • Know who the client contact is for late payments—projects WILL accrue interest expense for delayed payments. • Improve cash flow (e.g., paid when paid, early payment, partial invoice payments, establish billing milestones on lump sum projects, etc.). • DO NOT allow invoices to remain inactive. • Indicate how project profit objectives and cost reports will be monitored and reviewed. 		Date of Cash Management Plan:
G-10. Communication			
PG-3 Project Management–Implementation	<ul style="list-style-type: none"> • Clear lines of communication should be identified and documented with the client and project team. Determine frequency of contacts. • At a minimum, the Project Manager must indicate the circumstances and method that the client is to be notified of changes in scope, schedule, budget, or level of quality beyond original proposal or contract. The Contract Notice Checklist is an element of the Communication Plan. • Project decisions should be inclusive (consult client, ESQ, Procurement, Discipline Leads, Resource Leads, Project Controls/SCE, subcontractors, etc.). • Communications plan must meet the requirements of contract and/or proposal. • All team members should be notified if the four project objectives change. 		Date of Communications Plan:

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Project Element and References	Criteria	Assigned Responsibility	Status
G-11. Document Control			
PO-8 Document Control* PP-19 Confidential Business and Client Information PP-21 Standards of Conduct for Work in Non-company Facilities PG-3 Project Management–Implementation	<ul style="list-style-type: none"> • Setting up and maintaining a complete and current project file system is required. • The project file must contain completed contract, approved current TIP with RMP, work plan, peer review forms, Project Calendar, Client Kickoff Meeting and PRR notes. <p><i>Guidance: Ensure proper document control occurs on the project:</i></p> <ul style="list-style-type: none"> • <i>Maintain log and file project-related correspondence.</i> • <i>Maintain a current file index.</i> • <i>Identify records for archiving.</i> • <i>Ensure document checkout is performed.</i> • <i>Indicate in plan location of master controlled project file.</i> • <i>Purge and archive files at project close out.</i> • <i>Ensure client and confidential business information is properly protected.</i> • <i>Indicate how electronic files will be maintained and controlled.</i> 		Date of Document Control Plan:

EHS 1-4 : Subcontractor Selection and Management

**Last Revision By: Kennedy Lugo on
01/14/2011**

Created By: Lisa Kaminski on 01/04/2011

Purpose:	The purpose of this procedure is to provide criteria and instruction for the selection and management of Tetra Tech EC, Inc. (TtEC) subcontractors and Teaming Partners to prevent or minimize environmental, health, and safety losses from subcontractor activities.		
Version Date:	01/04/2011 - Revised	Original Issue Date:	02/01/95
Category:	Company Procedures	Sections:	ESQ - Environmental Health & Safety Programs
Sub Category:	Departmental/Discipline	Document Type:	Procedure
Keyword Index:	Field Activities/Environmental H&S, Field Activities/Environmental H&S, EHS Compliance/Waste Management, Field Activities/Science, Operational Control, Training, Monitoring	Document Owner:	Grey Coppi
Approved By:			

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See Below

▼
1.0 PURPOSE

The purpose of this procedure is to provide criteria and instruction for the selection and management of Tetra Tech EC, Inc. (TtEC) subcontractors and Teaming Partners to prevent or minimize environmental, health, and safety losses from subcontractor activities.

▼
2.0 SCOPE

This program applies to all TtEC subcontractors and lower tiered subcontractors who perform high loss potential (HIPO) fieldwork or who are selected or contracted by TtEC to manage, transport or dispose of waste. For work occurring outside of the United States, see the Health and Safety Policy for U.S. Based Employees Working in Foreign Countries.

Clients who select and contract directly with a waste management subcontractor where TtEC is not involved are not subject to this procedure.

▼
3.0 MINIMUM REQUIREMENTS

3.1 Responsibilities

3.1.1 Line Management

Program and Project Managers shall ensure that this procedure is implemented. They shall identify on the Purchase Requisition if the subcontractor^{GC} being solicited is performing HIPO work or involves waste management, thus invoking this procedure.

3.1.2 Environmental, Health and Safety Personnel

The PESM or designee shall perform reviews and approve subcontractor and waste management reviews, including conditional approvals of waivers.

3.1.3 Procurement

Procurement shall ensure that procurement packages contain the appropriate attachments from this procedure and that reviews and approvals per this procedure are obtained prior to contract award. Procurement shall also ensure that copies of the subcontractor EHS prequalification packages and approvals are maintained in the contract file.

3.1.4 Subcontractors and Lower Tier Subcontractors

When lower tier subcontractors are used, TtEC Subcontractors shall provide the requirements of^{RG} this procedure to the lower tier subcontractor and either certify that lower tier subcontractors also meet these criteria, or obtain TtEC's express, written waiver approval by the responsible Vice President and PESM.

3.2 HIPO Subcontractors

Subcontractors performing HIPO Field Work shall be identified by the Program or Project Manager.

3.2.1 Special Provisions

All TtEC subcontracts for which HIPO field work is performed shall contain the conditions found in Attachment A - Special Provisions - Environmental, Health and Safety Programs, also posted in Tetra Linx, the automated procurement software. Legal and the applicable Vice President shall approve any modification to Attachment A. Procurement shall ensure inclusion of Attachment A in relevant subcontracts.

3.2.2 Notification

The following information shall be provided as applicable by the Project Manager, or designee, to the procurement agent for inclusion in applicable subcontractor Requests for Proposals.

- a. Description of site characteristics, contaminants and anticipated health and safety hazards.
- b. Copy of the EHS Plan(s), when available,
- c. Client EHS requirements, if applicable,
- d. Training, certification, and/or medical requirements,
- e. Identification of specific EHS laws and regulations, if the work is covered by special OSHA regulations such as asbestos, lead, or process safety management, and
- f. Significant site - or project-specific EHS requirements that may impact budget estimation or bid amounts.

Prospective subcontractors will be required to submit information on their EHS program to TtEC as part of the TtEC Subcontractor Profile (Attachment B) if the information is more than one year old, or at the discretion of the PESM.

3.2.3 Evaluation and Approval

The Director, EHS Services, PESM, or designee shall evaluate the subcontractor using the criteria specified in the Field Subcontractor Profile Review Form, EHS Program Areas (Attachment C). Approval shall be documented using the Subcontractor Profile Evaluation Form, EHS Program Areas (Attachment D).

Subcontractor approvals are granted on an annual basis or a conditional basis. Annual evaluations may be waived IF the subcontractor has been continuously on a project site AND inclusion in weekly EHS inspections

per EHS 3-3, EHS Inspections, has been documented. [Annual updates to existing subcontractor evaluations may be limited solely to a review of loss data within the past 12 months.](#)

Any exceptions to TtEC Special Provisions (Attachment A) shall be approved by legal and/or the responsible Vice President. Subcontractors that do not meet the following criteria may only be used if conditionally approved by the Vice President responsible for the project and the PESM.

- a. EMR of one or less
- b. OSHA recordable incident rates, lost workday rates, and lost time case rates that are consistent with or less than the average rates for the industry classification.
- c. No OSHA citations or environmental compliance violations in the last five years

Subcontractors using lower tier subcontractors to perform HIPO field work shall be required to certify that their subcontractors have been selected using an equivalent qualification process and that they meet TtEC's criteria for EMRs, incident rates and OSHA and environmental violations or seek waiver (See Section 3.1.4).

3.2.4 On-Site Implementation

All subcontractors are required to follow TtEC EHS policies, procedures, and work rules as specified in the TtEC contract standard Terms and Conditions, Job Site Conditions and Job Site Regulations.

3.2.5 Inspections and Audits

Subcontractor operations shall be included in regular site inspections per EHS 3-3, Inspections, and may be included in other EHS Audits.

3.2.6 Post-Project Review

At the end of each project, the Procurement Agent will coordinate with the Project Manager to ensure that subcontractor EHS performance is documented on the Vendor Performance Evaluation System Form.

3.3 Waste Management Subcontractors

3.3.1 Notification

In order to prequalify to perform work for TtEC, the prospective subcontractors shall submit information on the environmental compliance history by completing the Waste Management Subcontractor Qualifications and Data Questionnaire (Attachment E). Procurement will evaluate past performance from a business perspective and EHS will evaluate past performance from a technical perspective.

3.3.2 Evaluation and Approval

The PESM or designee shall perform a desk audit to determine the environmental compliance status of the subcontractor. The desk audit will include agency interviews, review of permit documentation, as applicable, verification of technical capabilities, submittal of FOIA requests, and confirmation of compliance with USEPA's CERCLA Off-Site Rule. The PESM or designee shall complete the Waste Management Subcontractor Review Form (Attachment F).

Subcontractors who select or contract with lower tier waste management subcontractors shall comply with the same evaluation process and submit completed information to the PESM or designee for review and approval.

3.3.3 Approval Updates

Updates of the environmental compliance status of waste management and transporter subcontractors shall be conducted as follows:

1. **Wastes from CERCLA/Superfund Sites.** For wastes which contain CERCLA hazardous substances, the

EPA Off-Site Coordinator shall be contacted for each new project to confirm the facility's Off-Site Rule compliance, prior to initiating shipment of each new waste stream, or if more than 6 months has passed from the approval date for waste streams with prior approval. The Waste Management Subcontractor Review Form (Attachment F) shall be revised to document this review.

2. Waste from Non-CERCLA Sites and Transporters. Each subcontractor shall be reviewed at least every 12 months. The Manager, EHS Services, assigned PESH or designee shall revise/update the Waste Management Subcontractor Form and have it reviewed and approved by the Manager, EHS Services.

3.4 Records

Records subcontractor approval or disapproval status shall be maintained by the Director, EHS Services pursuant to TtEC procedure EHS 1-9, Recordkeeping. Procurement shall maintain files regarding approval status.

3.5 Client-Specified Waste Management Subcontractors

When a client directs TtEC to contract and use a waste management or transporter subcontractor that has not been pre-qualified by TtEC, the Project Manager shall obtain^{RG} written documentation, acceptable to the Legal Department directing TtEC to use the subcontractor. The evaluation of the subcontractor's environmental compliance status, contract, financial, insurance, and business factors shall be conducted. This documentation shall be maintained in the procurement file.

3.6 Inspection and Audits

On-site audits of waste management facilities shall be conducted on a case-by-case basis. Transporters shall be subject to on-site vehicle inspections upon arrival at the site.

3.7 Training

Procurement shall ensure that all Procurement Department personnel understand the requirements of this program. Operation's Management shall ensure that Line Managers understand the requirements of this program. ESQ Management shall ensure that appropriate ESQ staff understand the requirements of this program.

4.0 GUIDELINES

4.1 Definitions

4.1.1 High Loss Potential (HIPO) Field Work

This section shall contain optional guidance information to successfully execute the procedure or guideline.

HIPO Field Work is field work covered by 29 CFR 1910.120, field construction activities, and other activities as identified by the Program or Project Manager based on information in the TIP.

Defining HIPO work often requires an evaluation. The Program or Project Manager can obtain assistance in evaluating and determining if an activity is HIPO by contacting their PESH, ESS, Site Managers, Superintendents, or other Construction and Safety Professionals. While activities such as fence installation, grounds maintenance, site grading, paving, concrete work, surveying, utility locates, sampling, and shallow excavations may initially appear as low incident potential work, several factors need to be considered before making a final determination. Evaluation criteria should include:

- a. location where the work is performed and the existing hazards associated with the site; for instance, digging a 2-foot trench in an undeveloped area vs. digging a 2-foot trench next to the drydock of an active Shipyard pose different hazards.
- b. terrain where the work is being performed, including slopes, grades, and soil conditions; for instance, paving a parking lot versus paving an access road up a steep hillside to access a wind generation site.

- c. potential for encountering underground utilities or other buried hazards such as ordnance and munitions; for instance, installing a fence around a flat construction site vs. installing a fence around a former bombing range.
- d. the inherent dangers or risks associated with the types of subcontractors performing the work; if the proposed subcontractors in your work area have a history of poor safety performance, you may want to invoke EHS 1-4 to help you screen out these contractors or better identify their weaknesses, helping you better plan for the work.
- e. client requirements may restrict subcontractors with poor safety records from working on their site, therefore, EHS 1-4 should be followed to determine the safety performance of potential subcontractors.

Note: OSHA also identifies subcontractors that warrant additional prequalification evaluation. The OSHA criteria used for Voluntary Protection Program evaluation is - any subcontractor working more than 1,000 hours in any quarter.

Examples of Non-HIPO Work Generally Include:

- f. Landscaping (without use of heavy equipment)
- g. Concrete Flatwork (on grade)
- h. Minor equipment servicing and repairs
- i. Interior painting

Examples of Work That is Typically Considered HIPO Include:

- j. Mass Concrete, Concrete Walls and Suspended Slabs
- k. Site Grading
- l. Clearing & Grubbing, Chain Saw Work
- m. Demolition
- n. Critical Lifts, Work Involving Cranes
- o. Work around energized electrical lines
- p. Piping hot taps
- q. Structural steel erection
- r. Roofing & siding installation
- s. Drilling
- t. Explosives handling
- u. UXO work
- v. Electrical
- w. Lock out tagout/line breaking
- x. Confined space entry

y. Welding or torch cutting

4.1.2 Procurement

Procurement refers to the functional elements of the Procurement and Contracting Department directly reporting to the Vice-President, Project Management Services.

4.1.3 Subcontractor

A subcontractor is a person or business entity who signs a subcontract, (or purchase order, master ordering agreement, task order, etc.) to perform work for TtEC, the prime contractor. A subcontractor may also be called seller, vendor, or contractor.

4.1.4 Waste

Waste is defined as any material to be disposed, discharged, or recycled, including hazardous and non-hazardous (e.g., soil, groundwater, decon fluids, PPE, disposable equipment, laboratory wastes from on-site testing, used oil, scrap metal, debris, and wastewater). Non-hazardous waste under this procedure does not include office or trailer waste, sanitary waste, non-contaminated excavation soils intended for reuse, or recycled office or trailer waste such as paper and printer cartridges.

4.1.5 Waste Management Subcontractor

A subcontractor who performs waste transportation and treatment, storage, disposal, recycling, wastewater treatment, or operates other waste management facilities.

4.2 Waste Management Subcontractor General Guidelines

Waste management subcontractors holding Master Ordering Agreements are the preferred companies for waste management services. Other waste management subcontractors may be approved on a case-by-case basis using approved qualification criteria. Whenever feasible, the waste management subcontractor should provide waste characterization, transportation and disposal services so that the entire waste management process is under the control of one responsible party.

5.0 REFERENCES

Please Describe Your Reference Here	Place Your Link In This Column
1. C-2, Audits	
2. EHS 1-9, Recordkeeping	
3. EHS 3-2, Procedures - Environmental, Health & Safety Plans	
4. EHS 3-3, Inspections	
5. OSHA (U.S. Department of Labor, Occupational Safety & Health Administration), OSHA CSP 03-01-002 - TED 8.4 - Voluntary Protection Programs (VPP): Policies and Procedures Manual	
6. PO-2, Task Initiation (TIP)	
7. TtEC Policy - Health and Safety Policy for U.S. Based Employees	

Working in Foreign Countries	
8.	
9.	

▼
6.0 ATTACHMENTS

Please Provide a Description of the Attachment	Place Your Attachments Here
A. Special Provisions - Environmental, Health and Safety Programs	 EHS 1-4 Attachment A 12-10.doc
B. Subcontractor Profile - EHS Program Areas	 EHS 1-4 Attachment B 12-31-10.doc
C. Subcontractor Profile Evaluation Criteria - EHS Program Areas	 EHS 1-4 Attachment C.12-10.doc
D. Field Subcontractor Profile Review Form - EHS Program Areas	 EHS 1-4 Attachment D-12-10.doc
E. Waste Management Subcontractor Qualifications and Data Questionnaire	 EHS 1-4, Attachment E, 12-10.doc
F. Waste Management Subcontractor Review Form	 EHS 1-4, Attachment F, 12-10.doc

Tetra Tech EC, Inc.

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Tetra Tech EC, Inc.

Proprietary Information

EHS 1-4 ATTACHMENT A



TETRA TECH EC, INC.

SPECIAL PROVISIONS – ENVIRONMENTAL HEALTH AND SAFETY PROGRAMS

Subcontractor

Subcontract No. _____

Subcontractor hereby agrees to:

1. Comply with all federal, state, and local laws and regulations as well as all site rules and plans adopted by Tetra Tech EC, Inc. (TtEC) and its clients, pertaining to safety and health, pollution control, water supply, fire protection, sanitation facilities, waste disposal, emergency response notification and other related items.
2. Require their Site Manager to be available for all health and safety (HS) meetings.
3. Provide training and certification of training for all of their employees to perform site work safely and in accordance with OSHA and other applicable regulations and site procedures. Training for employees working on hazardous waste sites will meet the requirements of 29 CFR 1910.120, including initial, on-the-job, refresher, and supervisor training, as necessary. Training for employees who perform hazardous materials functions related to transportation must meet the requirements of 49 CFR 172, Subpart G, and employees who manage or otherwise handle hazardous waste will meet 40 CFR 264.16 or 265.16 training requirements. The PESM will determine the adequacy of subcontractor training programs, if required.
4. Provide or arrange for adequate first-aid facilities, persons qualified in first aid, and emergency transportation services. The SM shall be determine the adequacy of these arrangements and facilities.
5. Ensure that employees working on hazardous waste sites and other regulated areas are medically qualified and certified by a physician as capable of wearing personal protective equipment.
6. Report all site incidents that result in, or could have resulted in employee injury or illness, fire, explosion, spill, environmental release, permit exceedence or property damage immediately to the TtEC site representative. Such incidents will be investigated by the subcontractor to determine the causes and corrective actions. Copies of the investigation reports will be provided to TtEC and maintained on site.
7. Comply with the requirements of the TtEC Environmental Health and Safety (EHS) Plan(s) for the site work or develop and implement a Site EHS Plan in accordance with TtEC requirements.
8. Practice good housekeeping at all times. Waste, debris, and garbage shall be removed daily or placed in appropriate waste containers. All materials, tools, and equipment shall be stored in a safe, orderly and environmentally compliant fashion.

EHS 1-4 ATTACHMENT A

SPECIAL PROVISIONS – ENVIRONMENTAL HEALTH AND SAFETY PROGRAMS

9. Provide appropriate personal protective equipment and training to employees in its selection, use, maintenance and care. Personal protective equipment will be used when required by regulation or site rules. All personal protective equipment shall meet appropriate ANSI or NIOSH standards.
10. Cooperate fully with all other site subcontractors in their respective EHS programs.
11. Furnish all information concerning safety of its operations on the project as required by the TtEC Project Manager.
12. Implement hazardous work procedures for hot work, confined space entry, lockout/tagout, line breaking and excavations that are at least as effective as TtEC's. Subcontractor shall comply with all TtEC hazardous work permit requirements. The PESM will determine the effectiveness of the subcontractor's program.
13. Conduct no site work unless a TtEC representative is present or prior approval is obtained.
14. Address all deficiencies noted by TtEC and its client related to health, safety and environmental compliance.
15. Cooperate fully with any TtEC or regulatory agency inspections or audits. Immediately notify TtEC regarding the nature and scope of any inspection, and update TtEC on inspection activities each day. Copies of all notices, citations and inspection reports will be provided to TtEC.
16. Ensure lower tier subcontractors and waste management transporters, disposal, management, and treatment facilities, are selected and managed to prevent EHS losses from those activities.

Qualifications for Lower-Tier Subcontractors: Subcontractor is responsible for Environmental Health and Safety qualification of lower-tier subcontractors who will be performing field services covered under 29 CFR 1910.120, or construction services. Onsite lower-tier subcontractors must have an EMR of 1 or less, and OSHA recordable incidence rates, lost workday rates and lost time case rates, that are consistent with or less than the average rates for the industry classification. Additionally, lower-tier subcontractors should not have any OSHA citations or environmental compliance violations in the past 5 years. In the event that the lower-tier subcontractors selected by Subcontractor do have either OSHA citations or environmental compliance violations in the past five years, or an EMR or incident rates that exceed the criteria, Subcontractor must specifically bring such information to TtEC's attention and seek TtEC's express, written waiver of such requirements prior to the award of the subcontract. This information shall be submitted to TtEC prior to, and as a condition of, award of the subcontract. Such waiver does not create an approval of the lower-tier subcontractor by TtEC, nor does it change the subcontractors complete responsibility for the lower-tier subcontractor's performance.

The following lower tier subcontractor, _____, does not meet the requirements in the area of _____; applicable documentation is attached.

Subcontractor Profile - Environmental Health and Safety Program Areas

Company Name:		Primary SIC Code(s):			
Project Name/Location:		Primary NAICS Code(s):			
Loss History COMPANIES PROVIDING ANNUAL UPDATE ONLY USE ONLY SHADED AREAS ON THIS FORM	Current Year	Last Year	Previous Year	Previous Year	
1. Experience Modification Rate <i>(Attach verification – see Page 2)</i>					
2. Total Employee Hours Worked by Calendar Year					
3. Total Number of Recordable Injuries and Illnesses <i>(OSHA 300 - Columns G+H+I+J)</i> <i>(Attach OSHA 300 form for each year listed)</i>					
4. Total Recordable Incidence Rates [[Row 3 x 200,000] / Row 2] (See Page 2)					
5. Number of Cases that Involved Days Away From Work (OSHA 300 - Column H)					
6. Days Away Incidence Rates [Row 5 x 200,000 / Row 2] (See Page 2)					
7. Number of cases, Remained at Work, but Transferred or Restricted (OSHA 300 - Column I)					
8. DART Incidence Rate [[Row 5 + Row 7] x 200,000 / Row 2] (See Page 2)					
Total Number of Fatalities (Column G on OSHA 300) (See Page 2)					
OSHA Form 300 Record Keeping:					
• Have you employed more than 10 employees during the last 3 years?			<input type="checkbox"/> Yes	<input type="checkbox"/> No	
• If yes, have you maintained OSHA 300 Forms as required by Federal Law?			<input type="checkbox"/> Yes	<input type="checkbox"/> No	

Subcontractor Profile - Environmental Health and Safety Program Areas

Required EMR Documentation:

Experience Modification Rates:

This may be in the form of a memo on worker compensation insurance provider's letterhead, NCCI certificate, or other appropriate document.

EMR Corrective Action Plan:

If any EMR rate listed is greater than 1.0, you must attach a Corrective Action Plan. The Corrective Action Plan must explain why the EMR(s) are greater than 1.0, and descriptions of the corrective action(s) that have been implemented to reduce the EMR to 1.0 or less.

Incidence Rates:

The incidence rates that you insert into the table on Page 1 will be compared to the U.S. Bureau of Labor Statistics tabulated Incidence Rates for the most recent year available. The Incidence Rates used will be that of the NAICS Code which most closely represents the nature of the work to be performed by your firm on the subject project.

If any Incidence Rate listed in the table on Page 1 is greater than the appropriate National Average, you must attach a Corrective Action Plan. The Corrective Action Plan must explain in detail why the Incidence Rates are above the National Averages, as well as descriptions of the corrective action(s) that have been implemented to reduce the Incidence Rates, and a demonstration of the effectiveness of the corrective actions to date.

Fatalities:

If any fatalities are indicated on the table on Page 1, then a detailed explanation of the fatality must be provided. In addition, you must attach a Corrective Action Plan. The Corrective Action Plan must contain detailed descriptions of the corrective action(s) that have been implemented to prevent recurrence of similar incidents in the future, and a demonstration of the effectiveness of the corrective actions to date.

Subcontractor Profile - Environmental Health and Safety Program Areas

Substance Abuse Programs	
Does your company have a substance abuse program which includes pre-employment, "for cause", and post accident employee drug and alcohol testing?	<input type="checkbox"/> Yes <input type="checkbox"/> No
If not, will you implement a program for work subcontracted to your company?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Does your company have a program in place that complies with the Federal Drug-Free Workplace Act?	<input type="checkbox"/> Yes <input type="checkbox"/> No
If not, will you implement a Drug-Free Workplace Program that complies with Federal requirements (DFAR Clause 252.223-7004) for work subcontracted to your company?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Environmental Health and Safety Program Elements (check all that apply)	
<p><i>Written Health and Safety Programs</i></p> <p><i>(Attach a listing of the written programs or a copy of the table of contents for the programs)</i></p>	<input type="checkbox"/> Management Commitment and Policy regarding health and safety <input type="checkbox"/> Company Health and Safety Program Manual <input type="checkbox"/> Safe Operating Procedures for high hazard operations <input type="checkbox"/> Written Respiratory Protection Program <input type="checkbox"/> Written Hearing Conservation Program <input type="checkbox"/> Written Hazard Communication Program <input type="checkbox"/> Written Bloodborne Pathogen Program <input type="checkbox"/> Written Medical Surveillance Program <input type="checkbox"/> Written Lockout/Tagout procedures <input type="checkbox"/> Written Confined Space Entry procedures
Worksite Evaluation and Analysis	<input type="checkbox"/> Formalized methods to identify and control high hazard operations <input type="checkbox"/> Job or Task Hazard Analysis developed for hazardous operations <input type="checkbox"/> Formalized accident/incident reporting and investigation process <input type="checkbox"/> Documented "lessons learned" program
Safety Committees and Meetings	<input type="checkbox"/> Active company or organization health and safety committee <input type="checkbox"/> Active site health and safety committee <input type="checkbox"/> Employee and labor inclusion in site committee <input type="checkbox"/> Daily "toolbox" site safety meeting requirement <input type="checkbox"/> Weekly site safety meeting requirement <input type="checkbox"/> Monthly site safety meeting requirement <input type="checkbox"/> All employees required to attend site safety meetings <input type="checkbox"/> Subcontractors required to attend safety meetings
Environmental Health and Safety Inspections/Audits	<input type="checkbox"/> Line management participation in site EHS inspections/audits Frequency _____ <input type="checkbox"/> EHS specialist participation in site EHS inspections Frequency _____ <input type="checkbox"/> Requirement for independent audits of site EHS program By whom? _____ <input type="checkbox"/> Written documentation of EHS inspection/audit findings <input type="checkbox"/> Written documentation of EHS inspection/audit corrective actions
Environmental Health and Safety Training and Awareness Programs	<input type="checkbox"/> Safety training and orientation for new hires <input type="checkbox"/> Safety training and orientation for line management <input type="checkbox"/> Safety training and orientation for site supervisors/foremen <input type="checkbox"/> Safety training and orientation for subcontractors <input type="checkbox"/> Periodic employee/supervisor safety training <input type="checkbox"/> DOT Hazardous Materials (49 CFR 772, Subpart G) trained workers <input type="checkbox"/> Hazardous Waste (29 CFR 1910.120) trained workers <input type="checkbox"/> RCRA facility (40 CFR 264.16 or 265.16) trained workers
Environmental Programs	<input type="checkbox"/> Policy statement for environmental compliance or management <input type="checkbox"/> Written program for environmental compliance or management <input type="checkbox"/> Procedures for prevention and reporting of spills or releases <input type="checkbox"/> Procedures for reporting permit exceedences <input type="checkbox"/> Procedures for review/approval of waste management and/or transporter vendors or subcontractors

Subcontractor Profile - Environmental Health and Safety Program Areas

<i>Environmental Health and Safety Compliance History</i>	
<p>The following compliance questions relate to your company and operations over <u>the past 5-year period</u>. The term company is inclusive of all operations nationwide, all associated subsidiaries, companies and operating divisions and all company names currently and previously used. (Tetra Tech will check various available databases to verify the information provided on this form).</p>	
<p>Has OSHA (Federal or State) issued any citation(s) to your company?</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<p>Has OSHA (Federal or State) issued any citation(s) to subcontractors working on projects or sites managed by your company?</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<p>Are there any past or pending Environmental Enforcement Actions or environmental compliance violations for your company?</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<p>For projects, subcontractors, or sites managed or operated by your company, are there any past or pending Environmental Enforcement Actions or Environmental Compliance Violations for any other related organization? <i>(Note: Related organizations would include subcontractors, site owners, other companies, subsidiaries, or government organizations. This question is limited to the time period when your company was in management or operational control of the project or site.)</i></p>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<p><i>If yes to any question above, attach a copy of the Violation, Citation, or Enforcement Action; provide a description, including an explanation of the circumstances and resolution(s) with the agency. Please provide a discussion of what corrective action(s) have been implemented to prevent recurrence, and a discussion of the effectiveness of these corrective actions to date.</i></p>	
<p>I certify that the foregoing environmental health and safety compliance history is true and correct, and that I am a duly authorized representative of the company.</p>	
<p>_____</p> <p>Printed Name</p>	<p>_____</p> <p>Title</p>
<p>_____</p> <p>Signature</p>	<p>_____</p> <p>Date</p>

Company contact for additional health, safety and environmental program information:

Printed Name	Title
Phone Number	Fax Number

Summary of Required Documentation and Submittals:

- Insurance provider documentation of EMR for current and past three years.
- OSHA 300 Forms for current and past three years.
- Description/Explanation and Corrective Action Plan(s) If any of the following are true; EMR(s) greater than 1.0, Incidence Rate(s) above National Average, previous fatality.
- Table of contents from Health and Safety and/or Environmental Compliance Program Manual(s). (Tetra Tech reserves the right to request a copy of the entire document)
- In the event of a previous OSHA citation or Environmental Enforcement Action, a description of the circumstances of the violation, and a Corrective Action Plan which describes measures taken to prevent recurrence of the condition/action which resulted in the citation/enforcement action.
- Documentation of a Substance Abuse Program which includes pre-employment, "for cause", and post-accident drug and alcohol testing, and a Drug-Free Workplace Program which complies with Federal requirements (DFAR Clause 252.223-7004). Proof of negative drug screen results will also be required for each employee who will be working on the project site before the commencement of site work.

EHS 1-4 ATTACHMENT C



TETRA TECH EC, INC.

SUBCONTRACTOR PROFILE EVALUATION CRITERIA ENVIRONMENTAL HEALTH AND SAFETY PROGRAM AREAS

Six environmental health and safety (EHS) program areas are evaluated to initially qualify a subcontractor to perform work for Tetra Tech EC, Inc. EHS information provided on the Subcontractor Profile is used as the basis of the evaluation.

1. Loss History

Each Experience Modification Rates (EMR) listed must be substantiated with a letter from the subcontractor's insurance carrier or a letter from the subcontractor stating why an EMR is not established. Both the average of the EMR listed **and** the most recent EMR should be less than or equal to 1.0. For years where an EMR is not established, the EMR is assumed to be 1.0.

Three injury/illness incidence rates (total recordable, lost workday, and lost time) will be compared to the Bureau of Labor Statistics national averages for the NAICS/SIC code most appropriate to work the subcontractor is anticipated to perform. Subcontractor incidence rates in the current and previous 3 years must be below the national averages for each of the three incidence rate categories. Incidence rates listed must be substantiated by OSHA 300 forms for the subcontractor unless they are exempt from the form requirement. Smaller companies (less than 200,000 workhours/year) may be prequalified by the ESQ support staff member at higher rates if the total number of cases over the time period are judged reasonable. Prequalification of a subcontractor with high loss averages (EMR >1 or incidence rates above the industry averages) requires an acceptable corrective action plan **and** approval of the appropriate VP and EHS support staff member.

2. Substance Abuse Programs

The subcontractor must state whether or not they have a substance abuse program in place which meets the requirements of the federal Drug Free Workplace Act **and** if it includes a provision for post incident employee drug and alcohol testing. Subcontractors who do not have a program in-place but are willing to implement the required substance abuse program, may be given conditional prequalification. Subcontractors with conditional approval will be required by subcontract to have a substance abuse program in-place prior to the start of work.

3. Environmental Health and Safety Program Elements

The supporting EHS staff member will make a qualitative assessment of the subcontractor environmental health and safety program. The assessment will be made on the basis of the information provided on the Subcontractor Profile form, and compared to the type of work the company is reasonably anticipated to perform. A program that appears developed and contains elements such as company ESQ policy, written procedures, worksite inspections, employee training and awareness, and similar items is considered acceptable. A program that appears to be undeveloped and does not contain the basic elements necessary for completing work in a safe and compliant manner is considered unacceptable.

4. OSHA Compliance History

The subcontractor should have zero OSHA citations in the past 5 years. Prequalification of a subcontractor with OSHA citation(s) requires an acceptable corrective action plan **and** approval of the appropriate VP and EHS support staff member.

EHS 1-4 ATTACHMENT C

SUBCONTRACTOR PROFILE EVALUATION CRITERIA ENVIRONMENTAL HEALTH AND SAFETY PROGRAM AREAS

5. Environmental Compliance History

The subcontractor should not have any past or pending environmental enforcement actions or violations in the past five years. This includes the subcontractor, lower tier subcontractors, and sites or projects that are or have been managed by the subcontractor. Prequalification of a subcontractor with environmental enforcement actions or violations requires an acceptable corrective action plan **and** approval of the appropriate VP and EHS support staff member.

6. Previous Performance

Poor EHS performance on previous projects may disqualify a subcontractor from further consideration. Information on previous performance will be checked by the procurement group in the TtEC Vendor Database and through reference checks with other companies or personnel during the prequalification process. Previous performers who received an unsatisfactory EHS reference will not be qualified without an acceptable explanation and corrective action plan if necessary.

Qualification Based on Additional Information

A subcontractor who does not qualify for subcontract work due to the evaluation of their EHS program or performance will be notified of the reason(s). If possible, the subcontractor will be offered an opportunity to submit additional qualifying information. The additional information may include an explanation of extenuating circumstances, additional programs or procedures instituted by the company to reduce risk, or other environmental health and safety initiatives with demonstrated effectiveness.

EHS 1-4 ATTACHMENT D



TETRA TECH EC, INC.

FIELD SUBCONTRACTOR PROFILE REVIEW FORM ENVIRONMENTAL HEALTH AND SAFETY PROGRAM AREAS

Environmental Health and Safety program information supplied by the named subcontractor was reviewed. The results and subcontractor status are summarized below.

Subcontractor Name:	Project Name/Location:
Address:	
City, State, Zip Code:	
Contact:	Telephone No.:

Subcontractor Status: <input type="checkbox"/> Prequalified <input type="checkbox"/> Not Prequalified <input type="checkbox"/> Conditional Prequalification <input type="checkbox"/> Incomplete Information to Prequalify <input type="checkbox"/> Other:	Comments:
---	--------------------------

Prequalification Review Summary

Loss History	M	DNM	C	I	Remarks:
Experience Modification Rating					
Incidence Rates					

Substance Abuse Programs	M	DNM	C	I	Remarks:
Substance Abuse					
Drug Free Workplace					

Env. Health and Safety Program	M	DNM	C	I	Remarks:
Written Programs					
Training Programs					

OSHA Compliance History	M	DNM	C	I	Remarks:
Company Citations					
Subcontractor Citations					

Env. Compliance History	M	DNM	C	I	Remarks:
Company					
Projects/Sites Managed					

EHS Review:	_____	_____	_____
	Printed Name	Signature	Date

VP Approval: (if applicable)	_____	_____	_____
	Printed Name	Signature	Date

M - Meets criteria DNM - Does not meet criteria C - Conditional I – Incomplete information

 WASTE MANAGEMENT QUALIFICATIONS AND DATA QUESTIONNAIRE

Company Name: _____	Parent Company: _____
Address: _____	EPA ID No (RCRA*): _____
	EPA ID No (TSCA) _____
City/State/Zip: _____	Transporter ID No (s): _____
Contact: _____	DOT & MC No(s): _____
Phone: () _____	Motor Carrier Safety Rating: _____
Previous Name/Owners of Facility: _____	State Permit No(s): _____
<i>* For Transporters, please provide EPA Id No. for each state in which you propose transport in or through or attach list.</i>	
Solicitation or Subcontract No. _____	

1. LIST SERVICE CAPABILITIES:

	Treat	Store	Recycle	Dispose	Transport	N/A
Hazardous Waste (Federal/State) *						
Radioactive Waste						
Mixed Waste						
TSCA-PCBs *						
>50 ppm (liquid or solid)						
50> 500 ppm (liquid or solid)						
> 500 ppm (liquid or solid)						
PCBs < 50 ppm (maximum concentration is: _____)						
Special Waste						
Solid Waste						
Chemical Surety						
Asbestos						
UXO/OEW						
Debris (Type: _____)						
Waste Oil / Petroleum						
Carbon Regeneration						
Batteries						
Fuel Blending						
Solvents						
Soils						
Scrap Metal						
Universal Waste:						
Other:						

Other:	Yes	No	Transporter Mode:	Yes	No
Waste Water Treatment			Highway		
Transfer Station			Air		
Temporary Storage			Rail		
Bulking			Vessel		
Lab Packing					

*List applicable waste code / or attach appropriate documentation

Tt WASTE MANAGEMENT QUALIFICATIONS AND DATA QUESTIONNAIRE

2. LIST WASTE MATERIALS THAT CAN BE ACCEPTED AT YOUR FACILITY:

Physical Characteristics	Yes	No	Packaging Requirements	Yes	No
a. liquids			a. liquids - bulk loads		
b. solids			b. solids - bulk loads		
c. sludges			c. liquids - drummed		
d. debris			d. solids - drummed		
e. gases			e. rail access		
f. multi-layered					

3. IDENTIFY OTHER SERVICES OR CAPABILITIES YOUR FIRM IS CAPABLE OF PROVIDING. IF NECESSARY, ATTACH ADDITIONAL SHEETS, BROCHURES, DOCUMENTS.

4. LIST AND PROVIDE INFORMATION REGARDING ANY TECHNOLOGIES USED AT YOUR FIRM, INCLUDING INFORMATION ON PATENTS. IF NECESSARY, ATTACH ADDITIONAL SHEETS, BROCHURES, DOCUMENTS.

5. LIST AND PROVIDE COPIES OF ALL FEDERAL, STATE, AND LOCAL PERMITS, LICENSES, AND AUTHORIZATIONS OR REQUESTS FOR RENEWAL THAT ALLOW YOU TO PROVIDE YOUR SERVICES (full copies are not required, provide only the front and/or certification page).

Permit	Permit Number	Issuing Agency/Contact Name

6. IS THE FACILITY APPROVED TO ACCEPT CERCLA WASTES UNDER THE OFF-SITE RULE? Yes No
If yes, date of last approval: _____
Waste types:

7. LIST REGULATORY AGENCY CONTACTS MOST FAMILIAR WITH FACILITY OPERATIONS AND REGULATORY COMPLIANCE HISTORY (e.g., facility inspectors, permit writers, etc.).

<i>Name</i>	<i>Agency</i>	<i>Phone Number</i>

8. LIST THE AGENCY, INSPECTOR'S NAME, DATE, AND RESULTS OF THE LAST AUDIT/INSPECTION BY A REGULATORY AGENCY.

9. LIST AND THEN SUBMIT COPIES OF ALL NOTICES OF VIOLATION, PAST AND PRESENT PENDING AND ACTUAL ADMINISTRATIVE, CIVIL AND/OR CRIMINAL ENFORCEMENT ACTIONS, FOR ALL LOCAL, STATE AND FEDERAL AGENCIES OVER THE PAST FIVE YEARS. PROVIDE DESCRIPTIONS OF ACTIONS TAKEN IN RESPONSE.

10. ARE THERE ANY PRESENT/HISTORICAL KNOWN RELEASES FROM THE FACILITY OR KNOWLEDGE OF GROUNDWATER CONTAMINATION? Yes No

If yes, provide list of historical spill/release records and corrective actions taken at facility. Provide status of any cleanup initiatives and agency name, contact person, and phone number.

11. PROVIDE A COPY OF THE TABLE OF CONTENTS FOR YOUR DOT AND RCRA TRAINING PROGRAMS. ⇒

12. PROVIDE TABLE OF CONTENTS FOR YOUR ENVIRONMENTAL COMPLIANCE PROGRAM ⇒

 WASTE MANAGEMENT QUALIFICATIONS AND DATA QUESTIONNAIRE
13. TRANSPORTATION SERVICES:

a. List USDOT and State Motor Carrier, EPA/State RCRA, TSCA and Solid Waste Violations for past two years.

b. List Motor Carrier Rating: USDOT _____ State _____

c. If rating is other than "Satisfactory" OR if accident, vehicle out-of-service rates, or driver out-of-service rates are above national average, provide copies of USDOT/State Inspection Vehicle Records for past two years.

14. PROVIDE COPIES OF PLANS FOR SPILLS AND RELEASES, TRANSPORTATION PROBLEMS (INCLUDING INTERIM STORAGE CAPABILITY) AND ARRANGEMENTS IN PLACE FOR EMERGENCY RESPONSE SUPPORT DURING TRANSPORT.
15. LIST ANY INTENDED SUBCONTRACTORS.
16. TRANSPORTERS: PROVIDE TABLE OF CONTENTS FOR DOT HM SECURITY PLAN. IF NOT REQUIRED TO HAVE A SECURITY PLAN, SUBMIT STATEMENT GIVING REASONS FOR NOT HAVING SUCH A PLAN (e.g., do not transport DOT Hazardous Materials subject to the requirements for a Security Plan).
17. TRANSPORTERS: PROVIDE A COPY OF DOT HM SAFETY PERMIT IF TRANSPORTING ANY OF THE FOLLOWING HM:

- Radioactive materials – a highway route controlled quantity of Class 7 materials.
- Explosives – more than 55 lbs. of a Division 1.1, 1.2 or 1.3 material; or an amount of Division 1.5 requiring a placard.
- Toxic-by-inhalation – Division 2.3 and 6.1 – specific quantities per hazard zone.
- Liquefied natural gas – in bulk packages of capacity \geq 3,500 gallons of liquid methane or natural gas; or other liquefied gas with \geq 85% methane.

N/A (Do not transport any HM that requires a DOT Safety Permit).



WASTE MANAGEMENT SUBCONTRACTOR REVIEW FORM

APPROVAL

Approved:

Conditionally Approved:

Declined:

PESM or Designee Signature: _____

Date: _____

Manager, EHS Services
Signature: _____

Date: _____

Restrictions/Comments: _____

I. BACKGROUND INFORMATION:

Company Name: _____

Physical Address: _____

City/State/Zip: _____

Business Address: _____

Contact One: _____

Parent Company: _____

Phone: () _____

EPA ID No (RCRA*): _____

Contact Two: _____

EPA ID No (TSCA) _____

Phone: () _____

USDOT ID No (s): _____

Fax: () _____

Motor Carrier Safety No(s)/
ICC #: _____

Previous
Name/Owners of
Facility: _____

** For Transporters, please provide EPA ID No. for each state in which you propose transport in or through or attach list.*

II. TtEC PROJECT INFORMATION:

TtEC Contact: _____

Project-Specific waste
description/codes: _____

Project: _____

Project Manager: _____

Waste contains hazardous substance:

Yes

No

Charge Number: _____

Project is CERCLA site:

Yes

No

Project Location: _____

TtEC Subcontract or Solicitation No: _____

III. ATTACH VENDOR QUALIFICATION AND DATA QUESTIONNAIRE TO THIS APPROVAL

A completed Vendor Qualification and Data Questionnaire (Attachment E), demonstrating facility's/transporter's service capabilities and waste acceptance criteria should be attached to this approval. This information will be entered into the TtEC National TSDF Database.



WASTE MANAGEMENT SUBCONTRACTOR REVIEW FORM

VI. SOLID/NON-HAZARDOUS WASTES		Not Applicable: <input type="checkbox"/>
State Agency/Department:	_____	Date Contacted: _____
Contact and Title:	_____	Most Recent Inspection Date: _____
Phone Number:	() _____	
Known Releases:	_____	
Enforcement Status/Comments:	_____	

VII. STATE/REGIONAL/LOCAL REQUIREMENTS		Not Applicable: <input type="checkbox"/>
(Contact Agencies regarding wastewater discharges, air emissions, soil/groundwater contamination, remediation activities and local land use planning approvals, etc.)		
Agency/Department:	_____	Date Contacted: _____
Contact and Title:	_____	Most Recent Inspection Date: _____
Phone Number:	() _____	
Known Releases:	_____	
Enforcement Status/Comments:	_____	

Agency/Department:	_____	Date Contacted: _____
Contact and Title:	_____	Most Recent Inspection Date: _____
Phone Number:	() _____	
Known Releases:	_____	
Enforcement Status/Comments:	_____	



WASTE MANAGEMENT SUBCONTRACTOR REVIEW FORM

VII. STATE/REGIONAL/LOCAL REQUIREMENTS (Continued)	
Agency/Department: _____	Date Contacted: _____
Contact and Title: _____	Most Recent Inspection Date: _____
Phone Number: () _____	
Known Releases: _____	
Enforcement Status/Comments: _____	

VIII. TRANSPORTATION	Not Applicable: <input type="checkbox"/>
A. USDOT (www.safersys.org)	
USDOT: _____	Date Contacted: _____
Contact and Title: _____	Most Recent Inspection Date: _____
Phone Number: () _____	
Insurance Verified and Up To Date _____	
DOT Motor Carrier Rating: _____	
Enforcement Status/Comments: _____	

B. STATE MOTOR CARRIER	
Agency/Department: _____	Date Contacted: _____
Contact and Title: _____	Most Recent Inspection Date: _____
Phone Number: () _____	
Insurance Verified and Up To Date _____	
Motor Carrier Rating: _____	
Enforcement Status/Comments: _____	

WASTE MANAGEMENT SUBCONTRACTOR REVIEW FORM

C. DOT HAZARDOUS MATERIALS SECURITY REQUIREMENTS

Is carrier transporting any of the following HM? Yes* No

- A highway route-controlled quantity of a Class 7 (radioactive) material in a motor vehicle, rail car, or freight container;
- More than 25 kg (55 pounds) of a Division 1.1, 1.2, or 1.3 (explosive) material in a motor vehicle, rail car or freight container;
- More than 1 liter (1.06 quart) per package of a material poisonous by inhalation, that meets the criteria for Hazard Zone A;
- **A shipment of a quantity of HM in a bulk package having a capacity equal to or greater than 3,500 gallons for liquids or gases, or more than 17.3 cubic yards for solids;**
- A shipment in non-bulk packaging of 5,000 pounds total gross weight or more of one class of HM for which placarding of a vehicle, rail car, or freight container is required;
- **A quantity of HM that requires placarding;** or
- A select agent or toxin regulated by the Centers for Disease Control and Prevention under 42 CFR Part 73.

* If Yes, Carrier is required to have a HM Security Plan:

- Carrier's HM Security Plan Table of Contents was reviewed & satisfactorily addresses the specific security risks associated with the HM being transported.
- Carrier's HM Security Plan Table of Contents was reviewed & does **NOT** adequately address the specific security risks associated with the HM being transported.

Comments:

Is carrier transporting any of the following HM? Yes* No

- Radioactive materials - highway route controlled quantity of Class 7 materials.
- Explosives – more than 55 lbs. of a Division 1.1, 1.2 or 1.3 material or an amount of Division 1.5 requiring a placard.
- Toxic-by-inhalation – Division 2.3 and 6.1 – specific quantities per hazard zone.
- Liquefied natural gas – in bulk packages of capacity \geq 3,500 gallons of liquid methane or natural gas; or other liquefied gas with \geq 85% methane.

* If Yes, Carrier is also required to have a HM Safety Permit:

- Carrier's HM Safety Permit was reviewed & is complete and current.
- Carrier's HM Safety Permit was reviewed & is **NOT** complete/current.
- Carrier does **NOT** have a HM Safety Permit.

Comments:



WASTE MANAGEMENT SUBCONTRACTOR REVIEW FORM

IX. CERCLA OFF-SITE STATUS – Complete for all facilities		Not Applicable: <input type="checkbox"/> (For transporters only)	
CERCLA Off-Site Coordinator:	_____	Approved to Accept CERCLA waste?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Phone Number:	() _____	Date of CERCLA Approval:	_____
Date Contacted:	_____		
Comments:	_____		

X. TECHNOLOGY – Complete for all facilities		Not Applicable: <input type="checkbox"/> (For transporters only)	
Is Technology Review Required?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
If Yes, Is Technology Review Completed?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date Completed:	

EHS 1-7 : Event Reporting and Investigation

**Last Revision By: Kennedy Lugo on
11/16/2010**

Created By: Cindy Leong on 10/07/2009

Purpose:	The purpose of this program is to: (a) specify the types of events to be reported and investigated, including both safety and quality-related events; (b) define internal Tetra Tech EC, Inc.(TtEC) and external event notification requirements; (c) ensure proper management and follow-up of each event; (d) meet regulatory notification and investigation requirements; (e) provide a mechanism to identify Environmental, Safety and Quality (ESQ) issues and areas for improvement and recognize job well done through the Zero Incident Performance® (ZIP) Slip.		
Version Date:	12/09/2009 - Revised	Original Issue Date:	02/01/95
Category:	Company Procedures	Sections:	ESQ - Environmental Health & Safety Programs
Sub Category:	Departmental/Discipline	Document Type:	Procedure
Keyword Index:	EHS Compliance/Waste Management, Field Activities/Environmental H&S, EHS Compliance/Spill Reporting, Field Activities/Science, Operational Control, Training, EHS Compliance/Permits, Nonconformance and Corrective and Preventive Action	Document Owner:	Grey Coppi
Approved By:			

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- 2.0 SCOPE
- 3.0 MINIMUM REQUIREMENTS
- 4.0 GUIDANCE
- 5.0 REFERENCES
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1.0 PURPOSE

The purpose of this program is to:

- a. Specify the types of events to be reported and investigated, including both safety and quality-related events.
- b. Define internal Tetra Tech EC, Inc. (TtEC) and external event notification requirements.
- c. Ensure proper management and follow-up of each event.

- d. Meet regulatory notification and investigation requirements.
- e. Provide a mechanism to identify Environmental, Safety and Quality (ESQ) issues and areas for improvement and recognize job well done through the Zero Incident Performance® (ZIP) Slip.



2.0 SCOPE

Event reporting requirements apply to all operations of TtEC and its subsidiaries (the "Company"), including subcontractor activities. The term "Event Reports" in this procedure encompasses Quality Event Reports (QERs), Near Miss, and EHS Event Reports.



3.0 MINIMUM REQUIREMENTS

3.1 Responsibilities

3.1.1 All Personnel

All personnel shall immediately report any event (see Section 4.1.1) to their supervisor. The report can be verbal or in writing.

Employees, including subcontractors, are required to participate in the investigation process as directed, and comply with corrective actions identified. Employees are also made aware of trends and may be asked to help develop lessons learned to prevent similar events from occurring.

3.1.2 Line Management

Line Management, including the Office Manager for office events and the Project Manager (PM) for project events shall:

- a. Be responsible for all client notifications - (Prior to initiation of project field activities, the Project Manager shall coordinate with the client to determine the appropriate agency notification responsibilities and procedures).
- b. Implement the appropriate internal notifications (see Table 1) as required by this program as soon as an event becomes known.
- c. The supervisor responsible for directly overseeing the work shall ensure completion of the Event Report. The supervisor shall directly participate in the causal analysis investigation.
- d. Ensure that corrective actions have been completed and properly documented.

3.1.3 Environmental Safety and Quality Personnel

Environmental Safety and Quality Personnel (Environmental Safety Coordinator, Environmental Safety Specialist, and Project Quality Control personnel) shall:

- a. Ensure that all notifications are made promptly.
- b. Ensure that all reports are fully completed.
- c. Ensure that all insurance and workers compensation forms are completed and submitted as necessary.
- d. Participate in event investigations of all Occupational Safety and Health Administration (OSHA) recordable injuries/illnesses, spills, releases, and other investigations.
- e. Communicate information about the event to applicable site and/or office employees.

3.1.4 Project Quality Control Manager

The Project Quality Control Manager shall review and approve QER investigation results, proposed remedial actions, determine the Event Risk in accordance with CRL Guideline HSG 2-7, Risk Prioritization, and identify the need to verify the effectiveness of corrective actions taken based on severity of Event Risk. The Project Quality Control Manager's evaluation of corrective action effectiveness should be summarized in the Comments section. Ineffective corrective actions should be elevated to the Director, Quality Programs for further evaluation and potential additional programmatic corrective actions.

3.1.5 Project Environmental and Safety Manager (PESM)

The PESH shall review and approve event investigation results, proposed remedial actions, determine the Event Risk in accordance with CRL Guideline HSG 2-7, Risk Prioritization, and identify the need to verify the effectiveness of corrective actions taken based on severity of Event Risk. The PESH's evaluation of corrective action effectiveness should be summarized in the Comments section. Ineffective correction actions should be elevated to the Director, EHS Services for further evaluation and potential additional programmatic corrective actions.

3.1.6 Director, EHS Services

The Director, EHS Services shall:

- a. Notify OSHA of any injuries or illnesses occurring within OSHA jurisdiction as required.
- b. Review/maintain log - which includes information on basis causes, immediate causes, and management control issues - of all investigations.
- c. Distribute summaries of events with periodic management reports.
- d. Communicate significant events to key personnel within the Company.
- e. Review basic causes of Company events to identify trends.
- f. Recommend EHS program modifications as necessary.
- g. Immediately notify the Tetra Tech Health and Safety Manager of any serious accident and provide follow-up information on serious accidents.
- h. Provide Monthly Injury Reports to the Tetra Tech Health and Safety Director.

3.2 Notifications

In addition to the reporting responsibilities specified in Section 3.1, the responsible supervisor is required to notify Work Care at 800-455-6155 (available 24 hours) of employee illness or injuries. Work Care's main office must be notified promptly of all injuries and illnesses so the affected employee receives prompt and appropriate medical advice. The call to Work Care must be made in addition to taking the affected employee to the local clinic. EHS 2-1, Emergency Preparedness, provides guidance for medical response and actions.

The responsible supervisor is also required to ensure notifications are made as outlined in Table 1.

The phone numbers and other means of contact for Company personnel shall be posted with the emergency notification list and/or integrated into the site-specific emergency notification list.

3.3 Event Report Generation

The information portion of the Event Report should be generated by the end of the supervisor's work shift on the day of the event, if possible, but no later than 24 hours after the event was reported by the supervisor and employee(s) involved in the event. The investigation completion time is provided in Section 3.4.

The Event Report and Investigation may be completed electronically in the Company Incident Database located on Lotus Notes or by hardcopy using Attachment A, Event Report and Investigation Form, or Attachment B, Quality Event Report Form. (Attachment C, Event Sketch, may be used to graphically depict **events**).

The forms are intended to be self-explanatory. If the supervisor or the employee has any questions regarding completion of the report, an ESQ representative should be contacted for support.

Both the employee(s) and the employee's supervisor must sign the Event Report.

For low loss-potential near misses, the ZIP Slip may be substituted for the standard Event Report. (See CRL Procedure PP-10, Employee Recognition).

3.4 Event Investigations

Event investigations are to be initiated and completed as soon as possible, but should be completed no later than 10 working days after the event has been reported.

Guidance for conducting investigations and cause analysis may be found in Section 4.3.

Table 1. Internal Notifications By Supervisor

EVENT TYPE	SUPERVISOR NOTIFIES...	TIMING¹	... WHO NOTIFIES	TIMING¹
Spill/release or Permit Exceedence	ESS	Immediately	PESM and Director, EHS Services	Immediately if external reporting required
	Project Manager	Immediately	Client and Area/Program Manager Government agency if required by contract/plan and Director, EHS Services not available (See 3.5.2)	Immediately if external reporting required
Fatality, Hospitalization of 1 or more persons, Fire, or Explosion	ESS	Immediately	PESM and Director, EHS Services OSHA reporting (See 3.5.1) Insurance AIG through Chartis @ 1-800-910-2667 (Company personnel only) (Not required inside Washington State)	Immediately Immediately Immediately
	Project Manager	Immediately	Area/Program Manager VP Construction Client	Immediately Immediately Immediately
Confirmed or Potential OSHA Recordable	ESS	Immediately	PESM and Director, EHS Services Insurance AIG through Chartis @ 1-800-910-2667 (Not required in Washington State)	Same day Same day Same day
	Project Manager	Immediately	Area/Program Manager VP Construction, VP Remediation, VP C&E, COO Client, if required	Same day Same day 24 hours or as specified by contract
Equipment/Property/	ESS	Immediately	PESM and Director, EHS Services	24 hours

Vehicle Damage				
	Project Manager	Immediately	Client (client property) Client (other property, if required) Equipment Manager Area/Program Manager VP Construction	Immediately 24 hours 24 hours 24 hours 24 hours
Potential Insurance Claim, other than Worker's Compensation	Project Manager	Immediately	Law Department and Procurement	24 hours
Office Events	ESC	Immediately	Operations Manager Director, EHS Services	24 hours
Quality Events	Project Manager Project QC Manager	Immediately Same Day	Program or Operations Manager Director of Quality Programs	24 hours 24 hours

¹Timing - Immediately - Real time verbal discussion or notification in writing

Same Day

24 hours - written event report copy; Client notification, or as specified in contract or project specification
ESS Environmental Safety Specialist ESC Environmental Safety Coordinator
PESM Project Environmental and Safety Manager QC Quality Control
VP Vice-President

Investigations that fall within the scope of the OSHA Process Safety Management Standard must meet the requirements of 29 Code of Federal Regulations (CFR) 1910.119(m). Projects that must meet this standard shall include the appropriate reporting requirements in project specific procedures or plans.

Project QC personnel should participate in the QER Cause Analysis and in determining an appropriate Action Plan.

Completed investigation reports should be submitted within 10 working days to:

- a. Project Manager or Office Manager for review and signature
- b. PESM or Project QC Manager (for QERS) for review and signature
- c. ESS (for projects) or ESC (for offices) for review and signature
- d. Director, EHS Services/Quality Services as applicable

Electronic submittal within 10 working days meets these reporting requirements. Additional reporting requirements are listed in Table 1.

The Project or Office Manager and the PESM, or Project Quality Manager must sign the report indicating their satisfaction with thoroughness of the investigation and the report and their concurrence that the action items address the identified causes. This constitutes the peer review, and the report, particularly the description, should be clear to readers not familiar with the project or incident.

3.5 External Notifications

3.5.1 OSHA Notification

Notification to OSHA is required within 8 hours if the event resulted in one or more fatalities and/or three or more hospitalized individuals. The 8-hour notification of OSHA is also required if a fatality or hospitalization of

three individuals occurs within 30 days after the event.

The Director, EHS Services, has the responsibility for making the OSHA notification. The senior site EHS representative shall make the notification if the Director, EHS Services is unavailable.

The Project Manager is responsible for notifying the client of any required OSHA notifications.

3.5.2 Agency Notifications for Spills, Releases, and Permit Exceedences

It is the Company's policy that *if a spill, release, or permit exceedence is determined to be reportable, the Company or the client shall perform the reporting in a timely fashion as defined by federal, state, or local laws and regulations*. Notifications shall be made per contract requirements or the project Communications Plan. Prior to initiation of project field activities, the Project Manager shall coordinate with the client to determine the appropriate agency notification responsibilities and procedures. During the conduct of project activities, the client shall be notified regarding the spill, release, or permit exceedence and the Company's notification determination.

The Project Manager, in conjunction with the PESM must determine whether a spill, release, or permit exceedence exceeds reportable quantities to a regulatory agency under federal, state, and/or local laws and regulations or permit conditions. This determination must be made quickly because many laws and regulations require that notifications be made within short time frames (immediately upon knowledge, but no later than 24 hours).

If a spill or release is determined not to exceed reportable quantities, the PESM shall evaluate whether the spill or release poses a threat to human health (for example, has or may release into known drinking water sources, has or may cause contamination of surface soils/materials/air accessible to the public, and so forth). If a spill or release is determined to pose a threat to human health, the Project Manager, with the assistance of the Director, EHS Services, as necessary, shall consult with the client to determine whether the spill or release should be reported to a regulatory agency.

3.6 Documentation

A copy of each Event Report shall be retrievable for the project or office files. The Event Report database may serve this purpose.

3.6.1 Documentation of Agency and Client Notifications

All agency and client notifications shall be documented on the **Event** Report form. Other documentation generated regarding verbal or written agency notifications (if required), including agency response to such notification, shall either be maintained in the project file or preferably, attached to the Event Report.

In instances where the client conducts the reporting, documentation shall be obtained from the client indicating that the agency was notified in accordance with federal, state, or local regulations and maintained in the project files. If the client verbally notifies the Company that the notification was made, the Project Manager shall document the conversation. In these cases, communications shall be recorded internally in accordance with EHS 1-10, External Regulatory Inspections and Notifications, for Environmental Management System reporting requirements.

If the spill, release, or permit exceedence is determined not to be reportable, the Event Report and Investigation shall include the rationale for not reporting the spill, release, or permit exceedence to a regulatory agency.

3.7 Training

The Director, EHS Services, and the Director, Quality Services, have the responsibility for ensuring that site and office supervisory personnel have the appropriate training to conduct event investigations.

ESSs shall be trained on a project-specific basis by the PESM to implement the spill/release and permit exceedence reporting requirements in conjunction with training on the requirements of the project-specific EHS Plans per Corporate Reference Library procedure EHS 3-2, Procedures—Environmental, Health & Safety Plan (s).

Personnel serving in a project or office supervision, or office supervision, ESQ position shall have completed and passed the Company provided self-study course entitled "Practical Loss Control Leadership within 3 months of initial assignment."



4.0 GUIDANCE

4.1 Definitions

4.1.1 Event

For the purposes of this program, an event is:

- a. An injury or illness that meets the OSHA recordability criteria
- b. Ergonomic-related pain complaints
- c. An exposure to a hazardous substance above the allowable exposure unit.
- d. A property/vehicle/equipment/heavy equipment/truck/passenger damage case that results in damage greater than \$500.
- e. A fire or explosion.
- f. A spill or release resulting from the Company, or subcontractor activities, including spills or releases from operations at a client facility of which Company employees have become aware.
- g. Discovery of chemicals or waste products in an office.
- h. A permit exceedance.
- i. Safety-related events reported by an enforcing authority (ISO 14001 Registrar requirement).
- j. Customer, or enforcing authority, complaints regarding the implementation of the Company's EMS or Quality Management System (QMS).
- k. External regulatory inspections that result in findings or citations.
- l. Quality events as defined in Section 4.1.3.
- m. Near-miss occurrences, as defined in Section 4.1.2 below¹

4.1.2 Near Miss

A "near miss" is an event, that has a reasonable probability in resulting in one of the outcomes described above if the circumstances were different and for which modifications to management programs will reduce the probability of occurrence or the severity of the outcome (see examples of Immediate and Basic causes in Attachment A.

4.1.3 Quality Event

QERs should be generated for the following two situations:

- a. When project quality deficiency reports identify a **significant condition adverse to quality**. A significant condition adverse to quality is one that, if uncorrected, could have a serious adverse effect on operability, level of quality, or presents a high loss potential.
- b. When an event reveals an opportunity for improved performance through modification of our management system.

4.1.4 Recognition and EMS Communication

ZIP Slips (See PP-10, Employee Recognition Programs) may be used to document employee recognition for a job well done, suggestions for improvement, or minor safety issues that should be resolved.

ZIP Slips may be used to document external inquiries or complaints regarding the Company's EMS or project-specific environmental aspects.

4.2 Continuous Improvement

TtEC's event investigation procedure and event report database is a tool used by the (ESQ) organization for continuous improvement by:

- Identifying the root causes of each event
- Tracking and trending
- Selecting appropriate corrective action(s), and person(s) responsible for corrections
- Providing Lessons Learned
- Identifying additional EHS orientation and training topics
- Identifying future health and safety goals and objectives

Corporate ESQ management periodically disseminates valuable information contained in the event/investigation program, company wide to employees in the form of ZIP Bulletins, Flash Reports, and Lessons Learned.

The EMS Coordinator should also review the Event Report database to identify trends and incorporate results into the continuous improvement of the EMS.

4.3 Cause Analysis

4.3.1 Immediate Cause

Determine the immediate causes, using the examples on the form. If one or more of the examples fits the circumstance, use those words in the cause description. Explain, e.g., Improper Lifting – employee attempted to lift box by bending at the waist and twisting while lifting. Be sure that the event description is sufficiently detailed to support the causal analysis in this section. An assumption of cause (e.g., improper lifting) from the injury (low back pain) is not acceptable.

4.3.2 Basic Cause

Like the Immediate Causes, use the guidewords on the form whenever appropriate and explain. For example, improper motivation may be because the correct way takes more time or effort; short cutting standard procedure is tolerated or positively reinforced; or the person thinks there is no personal benefit to always doing the job correctly.

Investigators should determine if a change in the work conditions, scope, methods or personnel contributed to the event. This may occur due to inadequate assessment of hazard potential or inadequate application of hazard controls. If "Change" was contributing, it will most likely be identified in combination with other basic causes.

Note: The investigator is encouraged to review the Practical Loss Control Leadership chapters on *Causes and Effects of Loss* and *Accident/Event Investigation* before doing the causal analysis. The investigation team should refer to the S.C.A.T. Chart available from the PESM when analyzing causes of high loss potential events, especially where motivation is suspected of being a Basic Cause.

4.3.3 Remedial Actions

Include all actions taken or those that should be taken to *prevent recurrence*. Be sure that actions address the causes. For example, training (safety meetings) may be a necessary response for lack of knowledge, but may be inadequate for improper motivation.

4.4 Loss Control Leadership for Non-Supervisory Personnel

All non-supervisory and non-ESQ positions (excluding craft workers) assigned to conduct field activities should complete the Practical Loss Control Leadership self-study course within one year of initial assignment.



5.0 REFERENCES

Please Describe your Reference Here	Place Your Link in this Column
1. OSHA 29 CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals	
2. EHS 1-10, External Regulatory Inspections and Notifications	
3. EHS 2-1, Emergency Preparedness	
4. EHS 3-2, Procedures - Environmental, Health & Safety Plan(s)	
5. Environmental Management System	
6. HSG 2-7, Risk Prioritization	
7. PP-10, Employee Recognition	
8.	
9.	



6.0 ATTACHMENTS

Please Provide a Description of the Attachment	Place Your Attachments Here
1. Attachment A - Event /Near Miss Report and Investigation	 EHS 1-7, Att A, 2007.doc
2. Attachment B - Quality Event Report Form	 EHS 1-7, Att B, 2007.doc
3. Attachment C - Event Sketch	 EHS 1-7, Att C, 2007.doc

Tetra Tech EC, Inc.

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Proprietary Information

Corporate ESQ Report # [Insert number here](#)

Project Name: [Insert name here](#)

EHS 1-7, Attachment A Event/Near Miss Report and Investigation

Checkboxes can be toggled on and off to show an "X" or not show an "X." Double-click on the box to activate a dialog box that shows possible selections. To preserve formatting when you cut and paste text, use the "paste special" command to paste: EDIT, PASTE SPECIAL, UNFORMATTED TEXT.

Guidance for filling out this form is provided in CRL Procedure EHS 1-7.

Section 1, General Information		
Short Description/Title Below: (limited to 125 characters). This is the description that will appear in the database listing.		
Type of Event/Near Miss (check all that apply):		
Was a person injured or made ill:		
<input type="checkbox"/> By something at work <input type="checkbox"/> By something outside the work environment <input type="checkbox"/> No injury or illness		
Did this event occur in one of our major offices? <input type="checkbox"/> Yes <input type="checkbox"/> No List Office:		
Did this event occur in a foreign country? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Did this event involve:		
A strain? <input type="checkbox"/> Yes <input type="checkbox"/> No Fire? <input type="checkbox"/> Yes <input type="checkbox"/> No		
A motor vehicle accident? <input type="checkbox"/> Yes <input type="checkbox"/> No Property damage (>\$500)? <input type="checkbox"/> Yes <input type="checkbox"/> No		
A repetitive motion injury? <input type="checkbox"/> Yes <input type="checkbox"/> No Spill/release? <input type="checkbox"/> Yes <input type="checkbox"/> No		
A fall? <input type="checkbox"/> Yes <input type="checkbox"/> No Permit exceedence? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Being struck by something? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Event Information		
Case #:	Site Case #:	Workers Comp #:
Where did the event occur?	Project # (4 digits):	
Site/Location Name:	Delivery Order #'s:	
Date of event:	Military time:	
TtEC Supervisor on duty:	Was Supervisor at event scene? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Event Location:		
What employee/employer category was involved in this event?		
<input type="checkbox"/> TtEC permanent		
<input type="checkbox"/> TtEC craft/temp service		
<input type="checkbox"/> Subcontractor		
<input type="checkbox"/> Other		
Employer of affected employee?		
Weather conditions:	Adequate Lighting at Scene? <input type="checkbox"/> Yes <input type="checkbox"/> No	
What was the employee doing, or what was happening, just before the event occurred? Describe the activity below, as well as the tools, equipment, or material the employee was using. Be specific. For example, "climbing a ladder while carrying roofing materials," "spraying chlorine from hand sprayer," or "daily computer key-entry."		

Corporate ESQ Report # [Insert number here](#)

Project Name: [Insert name here](#)

EHS 1-7, Attachment A Event/Near Miss Report and Investigation

What happened? What was the contact or event and how did it occur? Tell us below how the injury occurred. For example, "When the ladder slipped on the wet floor, the worker fell 20 feet," "worker was sprayed with chlorine when gasket broke during replacement," or worker developed soreness in wrist over time." Attach file if necessary.		
Section 2, Affected Employee Information		
Include injured person, driver/operator, or employee whose activities resulted in the event. A new event report must be created for each injured employee.		
Employee's name:	Sex <input type="checkbox"/> Male <input type="checkbox"/> Female	
Date of Hire:	Job classification:	Number of months at TtEC:
Work hours on shift prior to event:	Years in job classification (##):	
Did event relate to routine task for job classification? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Section 3, Injury/Illness Information (If not applicable, check here <input type="checkbox"/> and go to Section 4)		
Nature of injury of illness: Describe body part affected and how it was affected below. Be more specific than "hurt," "pain," or "sore." For example, "strained back."		
What object or substance directly harmed the employee? For example, "concrete floor," "chlorine," "radial arm saw." If this question does not apply to the event, leave it blank.		
Was First Aid provided? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Did the injury/illness result in <input type="checkbox"/> Days away (with or without restricted days) <input type="checkbox"/> Restricted days only <input type="checkbox"/> No or unknown		
Did employee die? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Medical treatment does not include examination, diagnostic tests, or First Aid. See ZIP Bulletin 109 for OSHA definition of First Aid. Attach treatment report/doctor's note or send copies to Director, EHS Services.		
Was medical treatment provided? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Section 4, Vehicle and Property Damage Information (If not applicable, check here <input type="checkbox"/> and go to Section 5)		
Damaged vehicle make:	Damaged vehicle model:	
Damaged vehicle VIN:	Vehicle owner:	
Property damaged:		
Describe property damage:		

Corporate ESQ Report # **Insert number here**

Project Name: **Insert name here**

EHS 1-7, Attachment A Event/Near Miss Report and Investigation

Section 5, Environmental Release (If not applicable, check here <input type="checkbox"/> and go to Section 6)		
<i>Environmental Release</i>		
Substance spilled or released:		
From where:	To where:	
Estimated quantity/duration:	CERCLA Hazardous substance? <input type="checkbox"/> Yes <input type="checkbox"/> No	
RQ exceeded? <input type="checkbox"/> Yes <input type="checkbox"/> No	Specify RQ:	
Reportable to agency? <input type="checkbox"/> Yes <input type="checkbox"/> No	Specify (place telecom in project file):	
Responsibility to report: <input type="checkbox"/> TtEC <input type="checkbox"/> Client <input type="checkbox"/> Other	Time frame:	
Written report (place report in project file): <input type="checkbox"/> Yes <input type="checkbox"/> No		
Response action taken:		
<i>Permit Exceedence</i>		
Type of permit:	Permit #:	
Date of exceedence:	Parameter(s):	
Criteria:	Exceedence levels:	
Exceedence duration:	Reportable to agency: <input type="checkbox"/> Yes <input type="checkbox"/> No	
Specify (place telecom in project file):	Written report: <input type="checkbox"/> Yes <input type="checkbox"/> No	
Time frame:		
Response action taken:		
Section 6, Notifications		
Insert names of TtEC personnel notified below:		
Name:	Date:	Time:
Client rep notified:	Date:	Time:
By whom:		
Agency notified:	Date:	Time:
By whom:		
Agency Contact Name:		
Section 7, Persons Preparing Report		
Signature of this form verifies that all supplied information is accurate.		
Employee's name (print):	Sign:	
Employee's name (print):	Sign:	
Supervisor's name (print):	Sign:	
Supervisor's phone number:		
Date:		
<i>Note to supervisor:</i> Supervisor is to forward a copy of the Event Report to immediate supervisor, PESM, ESS or ESC, and other personnel as identified in Table 1 of this procedure ASAP, but no later than 24 hours.		

Corporate ESQ Report # **Insert number here**

Project Name: **Insert name here**

EHS 1-7, Attachment A Event/Near Miss Report and Investigation

Section 8, Attach Sketches or Photos		
<i>Report Number:</i>		
Send sketch by mail, fax, or attach an electronic file. EHS 1-7, Attachment C, contains a template that can be used for creating sketches of accidents.		
<i>Vehicle Events</i>		
Write in the street names and, if possible, the points of the compass. Attach black-and-white hard-copy photos or JPG or BMP files (JPG file sizes are typically smaller) as appropriate. If the sketch appears on a police report or insurance form, this need not be completed. Attach the other report or send a hard copy to the Director, EHS Services.		
Section 9, Investigative Report		
Date Information:		
Date of event:	Date of investigative report:	
<i>Event Cost:</i>		
Other event costs: \$	WC claim value: \$	Estimated loss: \$
Cause Analysis		
Was the activity addressed in an AHA? <input type="checkbox"/> Yes (attach applicable section) <input type="checkbox"/> No		
Immediate Causes		
What actions and conditions contributed to this event? Check all that apply:		
Substandard Acts		
<input type="checkbox"/> Operating equipment without authority	<input type="checkbox"/> Horseplay	
<input type="checkbox"/> Failure to warn	<input type="checkbox"/> Using equipment improperly	
<input type="checkbox"/> Failure to secure	<input type="checkbox"/> Failure to follow procedure	
<input type="checkbox"/> Operating at improper speed	<input type="checkbox"/> Personnel not properly qualified	
<input type="checkbox"/> Making safety devices inoperable	<input type="checkbox"/> Failure to communicate	
<input type="checkbox"/> Removing safety devices	<input type="checkbox"/> Operating equipment outside of specified parameters	
<input type="checkbox"/> Using defective equipment	<input type="checkbox"/> Failure to check equipment prior to acceptance	
<input type="checkbox"/> Failure to use PPE properly	<input type="checkbox"/> Acceptance of defective equipment	
<input type="checkbox"/> Improper loading	<input type="checkbox"/> Failure to provide proper equipment	
<input type="checkbox"/> Improper placement	<input type="checkbox"/> Improper servicing/maintenance of equipment	
<input type="checkbox"/> Improper lifting	<input type="checkbox"/> Other substandard acts	
<input type="checkbox"/> Improper position for task	<input type="checkbox"/> Servicing equipment in operation	
<input type="checkbox"/> Under influence of alcohol/drugs		
Substandard Conditions		
<input type="checkbox"/> Guards or barriers	<input type="checkbox"/> Exposure to hazardous materials	
<input type="checkbox"/> Protective equipment	<input type="checkbox"/> Extreme temperature exposure	
<input type="checkbox"/> Tools/equipment or materials	<input type="checkbox"/> Illumination	
<input type="checkbox"/> Congestion	<input type="checkbox"/> Ventilation	
<input type="checkbox"/> Warning system	<input type="checkbox"/> Visibility	
<input type="checkbox"/> Fire and explosion hazards	<input type="checkbox"/> Radiation	
<input type="checkbox"/> Poor housekeeping	<input type="checkbox"/> Hazardous environmental conditions	
<input type="checkbox"/> Noise exposure	<input type="checkbox"/> Other substandard conditions	

Corporate ESQ Report # [Insert number here](#)

Project Name: [Insert name here](#)

EHS 1-7, Attachment A Event/Near Miss Report and Investigation

Enter brief explanation of each **immediate cause** below:

Basic Causes

What specific personal or job factors contributed to this event? Check all that apply:

Personal Factors	Job Factors
<input type="checkbox"/> Inadequate physical/physiological capability	<input type="checkbox"/> Inadequate leadership and/or supervision
<input type="checkbox"/> Inadequate mental/psychological capability	<input type="checkbox"/> Inadequate engineering
<input type="checkbox"/> Physical or physiological stress	<input type="checkbox"/> Inadequate purchasing
<input type="checkbox"/> Lack of knowledge	<input type="checkbox"/> Inadequate maintenance
<input type="checkbox"/> Lack of skill	<input type="checkbox"/> Inadequate tools and equipment
<input type="checkbox"/> Improper motivation	<input type="checkbox"/> Inadequate work standards
<input type="checkbox"/> Other personal factors	<input type="checkbox"/> Excessive wear and tear
	<input type="checkbox"/> Abuse and misuse
	<input type="checkbox"/> Change
	<input type="checkbox"/> Other job factors

Enter brief explanation of each **basic cause** below:

Section 10, Action Plan

What has or should be done to control each of the causes listed? Consider the following Management Programs in developing remedial actions:

<input type="checkbox"/> Leadership and administration	<input type="checkbox"/> Health control
<input type="checkbox"/> Training	<input type="checkbox"/> System evaluation
<input type="checkbox"/> Planned inspections	<input type="checkbox"/> Engineering controls and change management
<input type="checkbox"/> Task analysis and procedures	<input type="checkbox"/> Personal communications
<input type="checkbox"/> Task observation	<input type="checkbox"/> Group meetings
<input type="checkbox"/> Emergency preparedness	<input type="checkbox"/> General promotion
<input type="checkbox"/> Rules and work permits	<input type="checkbox"/> Hiring and placement
<input type="checkbox"/> Accident/event analysis and corrective and preventive action	<input type="checkbox"/> Materials and services management
<input type="checkbox"/> Personal protective equipment	

Corporate ESQ Report # [Insert number here](#)

Project Name: [Insert name here](#)

EHS 1-7, Attachment A Event/Near Miss Report and Investigation

Remedial Actions			
Actions	Person Responsible	Target Date	Completion Date
1.	1.		
2.	2.		
3.	3.		
4.	4.		
Section 11, Persons Performing Investigation			
Investigator's name:		Date:	
Investigator's name:		Date:	
Investigator's name:		Date:	
Management Review			
Note: Signature verifies that all supplied information is accurate; the description supports the causal analysis; and the Action Plan is sufficient to address the causes.			
Project/Office Manager Approval: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Comments:			
Sign:		Date of Approval:	
ESQ (PESM) Approval: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Comments:			
Sign:		Date of Approval:	
Note: Attach additional information as necessary. Supervisor to forward copy of Investigative Report to the PM or Office Manager or ESQ as soon as possible, but no later than 72 hours after the event. A copy shall be sent to the Director, EHS Services, within 24 hours of completion of the report. Attach here.			

Corporate ESQ Report # [Insert number here](#)

Project Name: [Insert name here](#)

EHS 1-7, Attachment B Quality Event Report and Investigation

Checkboxes can be toggled on and off to show an "X" or not show an "X." Double-click on the box to activate a dialog box that shows possible selections. To preserve formatting when you cut and paste text, use the "paste special" command to paste: EDIT, PASTE SPECIAL, UNFORMATTED TEXT.

Guidance for filling out this form is provided in CRL Procedure EHS 1-7.

Section 1, Event Description and Investigation			
Date of event:			
Office/Project Location:		Organization or Department:	
Means of identification:			
<input type="checkbox"/> Client concern	<input type="checkbox"/> Nonconformance report	<input type="checkbox"/> Audit report	<input type="checkbox"/> Corrective action request
<input type="checkbox"/> Supervisory review	<input type="checkbox"/> Peer review	<input type="checkbox"/> Project review	<input type="checkbox"/> Other (describe):
Enter Short Description/Title (limited to 125 characters) below. This is the description that will appear in the database listing.			
Issue Summary: Summarize the concern, problem, or situation that needs to be addressed. Identify who was involved and their role (e.g., performer, inspector, auditor).			
Section 2, Persons Preparing Report			
Signature of this form verifies that all supplied information is accurate.			
Employee's name (print):		Sign:	
Employee's name (print):		Sign:	
Supervisor's name (print):		Sign:	
Supervisor's phone number:			
Date:			
<i>Note to supervisor:</i> Supervisor is to forward a copy of the Event Report to immediate supervisor, PESM, ESS or ESC, and other personnel as identified in Table 1 of this procedure ASAP, but no later than 24 hours.			
Section 3, Investigative Report			
Date of investigative report:			
Other event costs: \$		WC claim value: \$	Estimated loss: \$
Cause Analysis			
<i>Immediate Causes</i>			
What actions and conditions contributed to this event? Check all that apply:			
Substandard Acts			
<input type="checkbox"/> Operating equipment without authority		<input type="checkbox"/> Inadequate inspection/peer review	
<input type="checkbox"/> Failure to follow/improper execution of procedure		<input type="checkbox"/> Poor judgment	
<input type="checkbox"/> Using equipment improperly		<input type="checkbox"/> Failure to communicate—written and/or verbal	
<input type="checkbox"/> Improper servicing/maintenance of equipment		<input type="checkbox"/> Acceptance of defective equipment/material	
<input type="checkbox"/> Under influence of alcohol/drugs		<input type="checkbox"/> Other substandard acts	
<input type="checkbox"/> Horseplay			

Corporate ESQ Report # [Insert number here](#)

Project Name: [Insert name here](#)

EHS 1-7, Attachment B Quality Event Report and Investigation

Substandard Conditions	
<input type="checkbox"/> Personnel not properly qualified or trained	<input type="checkbox"/> Inadequate oversight
<input type="checkbox"/> Defective equipment/material	<input type="checkbox"/> Inadequate procedure/instruction
Enter brief explanation of each immediate cause below:	
Basic Causes	
What specific personal or job management system factors contributed to this event? Check all that apply:	
Personal Factors	Job Factors
<input type="checkbox"/> Inadequate physical/physiological capability	<input type="checkbox"/> Inadequate leadership and/or supervision
<input type="checkbox"/> Inadequate mental/psychological capability	<input type="checkbox"/> Inadequate engineering
<input type="checkbox"/> Physical or physiological stress	<input type="checkbox"/> Inadequate purchasing
<input type="checkbox"/> Lack of knowledge	<input type="checkbox"/> Inadequate maintenance
<input type="checkbox"/> Lack of skill	<input type="checkbox"/> Inadequate tools and equipment
<input type="checkbox"/> Improper motivation	<input type="checkbox"/> Inadequate work standards
<input type="checkbox"/> Other personal factors	<input type="checkbox"/> Excessive wear and tear
	<input type="checkbox"/> Abuse and misuse
	<input type="checkbox"/> Change
	<input type="checkbox"/> Other job factors
Enter brief explanation of each basic cause below:	
Section 4, Action Plan	
What has or should be done to control each of the causes listed? Consider the following Management Programs in developing remedial actions:	
<input type="checkbox"/> Leadership and administration	<input type="checkbox"/> Engineering controls and change management
<input type="checkbox"/> Training	<input type="checkbox"/> Personal communications
<input type="checkbox"/> Planned inspections	<input type="checkbox"/> Group meetings
<input type="checkbox"/> Critical task analysis and procedures	<input type="checkbox"/> General promotion of Loss Control principles
<input type="checkbox"/> Task observation	<input type="checkbox"/> Hiring and placement
<input type="checkbox"/> Rules and work permits	<input type="checkbox"/> Materials and services management
<input type="checkbox"/> Accident/event analysis and corrective and preventive action	<input type="checkbox"/> Quality control
<input type="checkbox"/> System evaluation	

Corporate ESQ Report # [Insert number here](#)

Project Name: [Insert name here](#)

EHS 1-7, Attachment B Quality Event Report and Investigation

<i>Remedial Actions</i>			
Actions	Person Responsible	Target Date	Completion Date
1.	1.		
2.	2.		
3.	3.		
4.	4.		
Section 5, Persons Performing Investigation			
Investigator's name:		Date:	
Investigator's name:		Date:	
Investigator's name:		Date:	
Management Review			
Note: Signature verifies that all supplied information is accurate; the description supports the causal analysis; and the Action Plan is sufficient to address the causes.			
Project/Office Manager Approval: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Comments:			
Sign:		Date of Approval:	
ESQ (PESM, QA) Approval: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Comments:			
Sign:		Date of Approval:	
Note: Attach additional information as necessary. Supervisor to forward copy of Investigative Report to the PM or Office Manager or ESQ as soon as possible, but no later than 72 hours after the event. A copy shall be sent to the Director, EHS Services, within 24 hours of completion of the report. Attach here.			

EHS 1-11 : Training

Last Revision By: Deborah Rambarose on 11/16/2010
Created By: Lisa Kaminski on 10/15/2009

Purpose:	The procedure ensures that Tetra Tech EC, Inc. ("the Company") and subcontract employees have the necessary environmental, health and safety (EHS) training to safely perform their assigned tasks and to meet regulatory training requirements. This procedure identifies the minimum training requirements. For the most common training types, this procedure also provides the training content and frequency.		
Version Date:	11/15/2009 - Revised	Original Issue Date:	02/01/95
Category:	Company Procedures	Sections:	ESQ - Environmental Health & Safety Programs
Sub Category:	Departmental/Discipline	Document Type:	Procedure
Keyword Index:	Field Activities/Environmental H&S, Training, EHS Compliance/Waste Management, Operational Control	Document Owner:	Grey Coppi
Approved By:			

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See Below



1.0 PURPOSE

This procedure ensures that Tetra Tech EC, Inc. ("the Company") and subcontract employees have the necessary environmental, health and safety (EHS) training to safely perform their assigned tasks and to meet regulatory training requirements. This procedure identifies the minimum training requirements. For the most common training types, this procedure also provides the training content and frequency.



2.0 SCOPE

This procedure addresses the training requirements mandated by the Occupational Safety and Health Administration (OSHA), U.S. Environmental Protection Agency (USEPA), Department of Transportation (DOT), [US](#) Army Corps of Engineers ([US](#)ACE) and select internal Company requirements. Individual state and local requirements may be more stringent than federal requirements. It is important, therefore, to consult applicable state and local regulations.

Daily toolbox training, quarterly office meetings and similar "training" are covered in EHS 1-3, Employee Participation Program.



3.0 MINIMUM REQUIREMENTS

3.1 Responsibilities

3.1.1 Line Management

- a. Provide the resources necessary to implement the training program.
- b. Ensure employees have or receive required training prior to job assignment and remain current with the Company EHS training requirements where applicable.
- c. Ensure competent and qualified persons assigned to work have the knowledge necessary to determine hazards and the authority necessary to correct deficiencies.
- d. Identify candidates for Environmental Safety Supervisor (ESS) training.

3.1.2 Environmental, Health and Safety Personnel

Project Environmental Safety Managers (PESM):

- a. Approve candidates for ESS training.
- b. Conduct in-house training and/or ensure that qualified personnel are assigned to perform the training.
- c. [Provide assistance to](#) Project Managers to ensure that special training requirements for projects are identified and that the training is conducted.
- d. Assist Project Managers, as necessary, to ensure that appropriate outlines and training materials are developed for site-specific training.
- e. Ensure that training is properly documented in accordance with this procedure.

Environmental and Safety Supervisors:

- a. Ensure that personnel have the required training and appropriate documentation before being allowed to work on site.
- b. Ensure that site-specific training is conducted per the site EHS plan.
- c. Ensure that site personnel have the necessary training to safely use the personal protective equipment (PPE) selected for the project site.

Director, EHS Services:

- a. Maintains master records and documentation for EHS training courses.
- b. Approves course materials for company-wide EHS training programs.
- c. Ensures that this procedure addresses basic EHS and environmental management system (EMS)-related training requirements. Project-specific EHS training requirements are specified in EHS Plan(s) per Procedure EHS 3-2.
- d. Develops and make available the EHS training schedules.

3.2 HAZWOPER Training

3.2.1 Initial HAZWOPER Training, 29 CFR 1910.120(e)(3)

Company personnel performing work at hazardous waste sites, as defined by 29 CFR 1910.120, shall meet the initial training criteria of this procedure.

Where state requirements for hazardous waste worker training are more stringent, the ESS shall ensure that site workers have training which meets the additional state requirements.

3.2.2 8-Hour Annual Hazardous Waste Worker Refresher Training, 29CFR 1910.120(e)(3)

Hazardous waste workers shall attend an 8-hour annual refresher course in accordance with 29 CFR 1910.120. This requirement may be met by attending the 8-Hour Refresher Training offered by the Company or training from an outside source approved by the PESM.

- a. Anniversary date exceeded up to 15 days - Worker may work in contamination reduction zone, but employee and manager shall be notified by the PESM to promptly sign worker up for refresher class.
- b. >15 days to 60 days from anniversary date - worker may work in contamination reduction zone or exclusion zone if there is proof on site that a refresher class for that individual is scheduled.
- c. >60 days - worker may not work in contamination reduction zone or exclusion zones.

Note that some clients and states have more restrictive policies regarding the time frame for completion of the 8-hour refresher course.

If an individual has not attended refresher training for more than two years, or it has been more than two years since initial training, then the individual must demonstrate knowledge of the information for the initial training through a written test administered by the Director, EHS Services. After three years from initial training or the last refresher course, the individual must attend 40-hour initial HAZWOPER training again.

3.2.3 8-Hour Supervisory Training, 29 CFR 1910.120(e)(4)

On-site personnel who directly manage and/or supervise personnel engaged in hazardous waste operations (e.g., Project Managers, Field Operations Leads, Construction Superintendents, Craft Supervisors, and Health and Safety personnel) shall attend eight hours of specialized training that meet the requirements of 29 CFR 1910.120(e)(4). These eight hours of training are in addition to the 40 hours of initial or 8 hours of refresher training received in the year that the employee becomes a supervisor.

3.2.4 24-Hour On-The-Job Supervision, 29 CFR 1910.120(e)(3) and (4)

Company personnel who have attended initial 40-hour HAZWOPER training shall have 24 hours of supervised on-the-job experience by an individual who has completed the supervisory training and is an experienced hazardous waste worker. Site-specific orientation training is considered to constitute a component of this training. Personnel shall work under direct field supervision until the on-the-job training has been completed and documented using Attachment 1 or similar.

3.3 Site-Specific Training for Workers

Prior to beginning work at each project, the Company and subcontractor employees receive site-specific training, conducted by the site ESS or their designee. The topics covered shall include those addressed in the site-specific EHS plans; hazard communication for chemicals on-site; PPE required (when it is required to be used and how to use the PPE, if necessary) and other regulatory topics as necessary (See Attachment B).

3.4 Radiation Worker Training

Where potential exposure to radiation hazards exist, the Corporate Health Physicist shall determine the content and level of training required to address the potential site hazards, and meet project and/or regulatory requirements. These requirements are specified in the site-specific EHS plans.

3.5 UXO Training

Training requirements for personnel performing UXO-related activities are specified in the UXO section of the Corporate Reference Library. Additional requirements as necessary are specified in site-specific EHS plans by the Company UXO EHS Manager or designee.

3.6 First Aid/Cardiopulmonary Resuscitation Training

At least two members of each site team shall be certified in first aid and cardiopulmonary resuscitation when working on any field project. The certified members work in close enough proximity to other team members so

that they can administer CPR or first aid in a timely manner. Courses are taught by a certified instructor and approved by an organization such as the American Red Cross. On-line courses are not acceptable for First Aid or CPR training.

3.7 Environmental and Safety Supervisor (ESS) Training

ESS training is designed to ensure that full-time ESS's are capable of performing their responsibilities and to enable Company employees in disciplines other than industrial hygiene or safety to serve as an ESS on selected projects (cross-training). [Those serving as ESSs on project sites must:](#)

1. [have completed the ESS training as outlined in this procedure.](#)
2. [maintain the training requirements for an ESS as outlined in this procedure.](#)
3. [have completed the Loss Control training as offered by the Company.](#)
4. [be approved by the PESM to serve in this function based on background, education, experience and items #1 and 2 above. For USACE projects, the ESS is required to have 5 years of construction industry safety experience.](#)

[Candidates for ESS training](#) are identified by line management and approved by the PESM prior to initial training based on education, field experience, and Company experience. Attachment C is used to document the candidate's qualifications and obtain the necessary approvals.

The Company has established the following prerequisites to be acceptable as ESS cross-training candidates: 1) possess a background in a biological, physical, or safety science, engineering or construction; 2) have 400 hours of field experience on the type(s) of operations for which they are being cross-trained. [It is recommended that the candidate have](#) six months experience with the Company. Exceptions to the above requirements are granted at the discretion of the [PESM](#).

The ESS course includes successful completion of:

1. 30-hr OSHA Construction Safety course, and
2. A two-day Company ESS course.

Depending on the nature and risks of the project, additional training and qualifications may be identified by the PESM.

The content of the course will be reviewed and updated periodically by the Director, EHS Services. Guidance is provided in Section 4.2.

3.7.1 ESS Re-qualification

[The ESS shall maintain their competency through 24 hours of formal safety and health related coursework every four \(4\) years. This coursework may include any combination of the following:](#)

- [Initial HAZWOPER Training \(40 Hours\)](#)
- [Hazardous Waste Worker Refresher Training \(8 Hours\); once per year](#)
- [DOT Training; once every 3 years](#)
- [Hazardous Waste Management Training; once per year](#)
- [Practical Loss Control Leadership \(30 Hours\); one time](#)
- [First Aid/CPR Training; hours determined by provider; once per year](#)
- [OSHA 30 Hour Construction Safety Training](#)
- [OSHA 10 Hour Construction Safety Training](#)

[For courses not specifically listed above, their acceptability as "formal training" is at the discretion of the ESQ Training Department.](#)

3.8 DOT [Hazardous Materials Training 49CFR 172](#)

DOT training is required for any Company employee or subcontractor who functions as a "hazmat employee." New employees who perform a hazmat function must be trained within 90 days of assignment as a hazmat employee. Until such training has occurred, the employee works under the direct supervision of a DOT trained and knowledgeable employee.

Subcontractors provide certification of training at the start of the project, but no later than prior to performing a hazmat function. The ESS ensures the project files contain the subcontractors' certification of training.

The DOT refresher training is required every [three](#) years. [The DOT training meets the 49CFR 172.704 requirements and includes the following:](#)

- a. [General Awareness and Hazard Familiarization. This training is conducted through internet-based training.](#)
- b. [Security Awareness. This training is conducted through internet-based training.](#)
- c. [Function-specific training and Company policies associated with transportation of hazardous materials. This training is conducted through project-specific training.](#)
- d. [Safety training. The Safety Training is met through the HAZWOPER 8-hour refresher training.](#)

Additional function [or facility-specific training may be conducted on a project-specific basis. Where applicable, additional project specific training may also include: Facility Security Plan and IATA dangerous goods regulations/air shipments training.](#)

Training at an external course satisfies the DOT training requirement. [Course completion certificates should be forwarded to the TtEC Training Coordinator](#) for inclusion in the Company Records.

3.9 [Hazardous Waste Management Training, 40 CFR 264.16 or 265.16](#)

All Company employees who characterize, handle, manage, package, mark/label, inspect, and coordinate off-site transportation and disposal of hazardous wastes, including state-regulated hazardous waste shall receive waste management training. This training is strongly recommended for personnel who perform similar functions for non-hazardous, special and polychlorinated biphenyl (PCB) wastes. Subcontractors who perform on-site hazardous waste management activities must have documented 40 CFR 264.16 or 265.16 training.

New employees who manage or otherwise handle hazardous waste are trained within six months of assignment to this function. Until such training has occurred, the employee performs work under the direct supervision of a trained, knowledgeable employee.

Refresher training is required on an annual basis.

The waste management training course consists of:

- a. Instruction in hazardous waste management, including general requirements for contingency plan and emergency response in accordance with 40 CFR 265.16.
- b. Instruction on waste characterization, land disposal restriction (LDR) compliance, and off-site transportation and disposal as well as Company policies associated with these topics.
- c. Discussions regarding hazardous waste as well as PCBs, state-regulated, and non-hazardous wastes.

Additional waste management training may be conducted on a project-specific basis.

Training at an external course satisfies 40 CFR 264.16 or 265.16 requirements. Certificate of completion is forwarded to the Director, ESQ Services for inclusion in the Company Records.

3.10 OSHA Regulations with Other Annual Refresher Requirements

OSHA has numerous annual refresher training requirements not associated with HAZWOPER. These additional requirements are identified in Attachment B - EHS & Competent Person Requirements. These requirements are addressed, as needed, through office or project-based training and are identified in project health & safety plans.

3.11 Competent and Qualified Person Requirements

OSHA uses the term competent or qualified person in over 150 instances within 29 CFR 1910 and 1926.

Project Managers shall ensure that personnel assigned to the project meet the competent and qualified persons requirements identified in EHS plans. Project Managers shall consult with EHS personnel as necessary to determine requirements.

Attachment B includes a list of competent and qualified person requirements for activities common to the Company operations, and guidelines on determining the qualifications of competent persons.

3.12 Proficiency Assessment

All Company EHS courses utilize written assessment and/or skill demonstration. The means of proficiency testing shall be documented. Proficiency testing for other training is at the discretion of the instructor.

3.13 Recordkeeping

3.13.1 Course Documentation

The documentation for each Company EHS training course includes a course sign-in sheet for each day of the course, which indicates the date of the presentation, the length of the course, the topics covered, the names and signatures of the attendees, and the name(s) of the course instructor(s). Attachment D or an equivalent is used for all Company EHS training courses including site-specific training.

Copies of the training documentation for each Company EHS course including handouts, agenda, sign-in sheets, listing of audiovisuals, and tests are maintained by the Director, EHS Services in accordance with Company Procedure EHS 1-9, Recordkeeping. For non-Company training courses, a copy of the certificate of completion is forwarded to the Training Coordinator and maintained in each employee's training file.

3.13.2 Course Certificates

Each student successfully completing a course is issued a certificate which includes:

- a. Attendee's name [and employee number](#)
- b. Course title date(s) [and hours of instruction](#)
- c. Statement that the student has successfully completed the course
- d. Identification of specific regulatory requirement for which certification was provided, if applicable
- e. Corporation name [and address](#)
- f. Location of the training
- g. [The date the periodic refresher is due \(expiration date\)](#)
- h. Signature and title of instructor(s)

Electronic copies of the certificates are forwarded to the attendee. Copies are maintained in each employee's training file in accordance with EHS 1-9.

3.13.3 On-The-Job-Training

On-the-job training is documented using the form included as Attachment A or equivalent.

Copies of this form shall be forwarded to the Director, EHS Services for inclusion in each employee's training file.



4.0 GUIDELINES

4.1 Definitions

4.1.1 Competent Person

As stated in definitions section of OSHA CFR 1926.32(f), a competent person is one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authority to take prompt corrective measures to eliminate them.

4.1.2 Hazardous Material

Any material, equipment, or substance or waste that transportation authorities have deemed capable of posing risks in transport, or is listed in the regulations, their appendices or in a hazardous material table or the list of dangerous goods.

4.1.3 Hazardous Waste Site

OSHA, in its Hazardous Waste Operations and Emergency Response standard, defines hazardous waste site activities as covering the following operations, unless the employer can demonstrate that the operation does not involve the potential for employee exposure or the reasonable possibility for employee exposure to safety or health hazards.

- a. Cleanup operations, required by a governmental body, involving hazardous substances, that are conducted at uncontrolled hazardous waste sites, including, but not limited to the following, the U.S. Environmental Protection Agency's (EPA's) National Priority Site List (NPL), state priority site lists, sites recommended for the EPA NPL, Emergency Community Response Action, underground storage tanks, initial site investigations conducted before the presence or absence of hazardous substances has been ascertained.
- b. Corrective actions involving cleanup operations at sites covered by the Resource Conservation and Recovery Act of 1976 (RCRA) as amended (42 USC 6901 et seq.).
- c. Voluntary cleanup operations at sites recognized by federal, state, local, or other government bodies.
- d. Operating involving hazardous wastes that are conducted at treatment, storage, and disposal facilities regulated by 40 CFR Parts 264 and 265 pursuant to RCRA, or by agencies under agreement with EPA to implement RCRA regulations.
- e. Emergency response operations for releases of, or substantial threats of releases of, hazardous substances without regard to the location of the hazard.

4.1.4 Hazmat Employee

A person who directly affects hazardous materials transportation safety through any of the following activities:

- a. Determines proper shipping names
- b. Selects packaging for hazardous materials
- c. Packages, marks, and labels hazardous materials
- d. Completes shipping papers for hazardous materials
- e. Loads or unloads hazardous materials
- f. Operates a vehicle carrying hazardous materials
- g. Oversees employees and activities listed above

4.1.5 Qualified Person

A qualified person is one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his or her ability to solve or resolve problems relating to the subject matter, the work, or the project.

4.1.6 Company EHS Course

For the purposes of this procedure, Company EHS courses are those courses developed and provided by the Company to meet OSHA, EPA, DOT and other regulatory training requirements. These courses include the following:

- [HAZWOPER](#) 8 hr refresher
- Environmental Safety Supervisor ([ESS](#))
- DOT Training
- [Hazardous](#) Waste Management Training

These courses do not include the following:

- Daily toolbox training
- Quarterly office meetings and similar training covered in EHS 1-3
- New Employee Orientation
- Project specific training, even if the project specific training is used to meet OSHA requirements such as PPE and ladder safety.

[Trainers of Company EHS courses should maintain their skills by participating in continuing education, development programs, or experience related to their subject matter expertise and delivery skills.](#)

4.2 ESS Training Guidance

The ESS training should include, at a minimum, the following topics:

- ESS responsibilities and authorities
- Safety briefings and development of EHS plans
- EHS forms and documentation
- EPA, DOT, OSHA and applicable state standards and Company EHS procedures
- Health hazards (chemical and physical) recognition
- Hazard communication
- PPE selection and use
- Decontamination of personnel and equipment

- Instrumentation calibration, use, and limitations
- Decision-making exercises
- Safety hazards
- Emergency procedures and response
- Pollution Prevention
- Waste Management

4.3 Non-Regulatory Training Recommendations

Projects involved with the following activities should consider the inclusion of additional project specific training:

- Diving
- Working on or near water
- Demolition
- Drilling and blasting
- Cranes
- Spiders/[Snakes/Bear, etc.](#)
- Man-baskets
- ATV driving
- Biological or chemical weapon sites

4.4 Course Evaluations

Course evaluations are completed for the Company EHS courses. Copies or a summary of the evaluation shall be forwarded to the Director, EHS Service for each course.

Attachment E or an approved equivalent is used for course evaluations.



5.0 REFERENCES

Please Describe Your Reference Here	Place Your Link in this Column
1. EHS Training and Competent Person Requirements	
2. EHS 1-3, Employee Participation Program	
3. EHS 3-2, Procedures - Environmental Health & Safety Plan(s)	
4. EHS 1-9, Procedures - Recordkeeping	



6.0 ATTACHMENTS

Please Provide a Description of the Attachment	Place Your Attachments Here
A. Record of On-The-Job Supervised Training	 EHS 1-11 Attachment A 3 Day OJT form - Rev.doc
B. EHS Training and Competent Person Requirements	 EHS 1-11, Attachment B Competent Person Requirements.doc

C. ESS Nomination Form	 EHS 1-11 Attachment C ESS Nomination Rev.doc
D. EHS Training Course Sign-In Sheet	 EHS 1-11 Att DClass Sign In - Rev.doc
E. Training Course Evaluation Sheet	 EHS 1-11 Attachment E Course Eval - Rev.doc

Tetra Tech EC, Inc.

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Tetra Tech EC, Inc.

Proprietary Information



TETRA TECH EC, INC.
RECORD OF ON-THE-JOB SUPERVISED TRAINING

Last name	First	MI											
Company		Employee No.											
Address													
Immediate Supervisor		Position											
Day 1 (Date) _____													
Supervised by _____		Title _____											
Company _____													
Supervised duties _____													

<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Protection levels</th> <th style="width: 10%;">D</th> <th style="width: 10%;">C</th> <th style="width: 10%;">B</th> <th style="width: 40%;">Total hours</th> </tr> </thead> <tbody> <tr> <td colspan="5">Supervised hours in each</td> </tr> </tbody> </table>				Protection levels	D	C	B	Total hours	Supervised hours in each				
Protection levels	D	C	B	Total hours									
Supervised hours in each													
Comments _____													

Supervisor _____		Trainee _____											
Signature		Signature											
Day 2 (Date) _____													
Supervised by _____		Title _____											
Company _____													
Supervised duties _____													

<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Protection levels</th> <th style="width: 10%;">D</th> <th style="width: 10%;">C</th> <th style="width: 10%;">B</th> <th style="width: 40%;">Total hours</th> </tr> </thead> <tbody> <tr> <td colspan="5">Supervised hours in each</td> </tr> </tbody> </table>				Protection levels	D	C	B	Total hours	Supervised hours in each				
Protection levels	D	C	B	Total hours									
Supervised hours in each													
Comments _____													

Supervisor _____		Trainee _____											
Signature		Signature											
Day 3 (Date) _____													
Supervised by _____		Title _____											
Company _____													
Supervised duties _____													

<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Protection levels</th> <th style="width: 10%;">D</th> <th style="width: 10%;">C</th> <th style="width: 10%;">B</th> <th style="width: 40%;">Total hours</th> </tr> </thead> <tbody> <tr> <td colspan="5">Supervised hours in each</td> </tr> </tbody> </table>				Protection levels	D	C	B	Total hours	Supervised hours in each				
Protection levels	D	C	B	Total hours									
Supervised hours in each													
Comments _____													

Supervisor _____		Trainee _____											
Signature		Signature											

EHS TRAINING AND COMPETENT PERSON REQUIREMENTS

EHS TRAINING REQUIREMENTS

REQUIREMENT	REFERENCE	COMMENT(S)
Accident Prevention Signs	1910.145(c)	Initially
Air Sampling Training	1910.146(h)(2)	Initially
Arc Welding Equipment Operation and Maintenance	1910.254(a) & (d) 1910.252(a), (b), (c), & ANSI 6.1 - 1966	Initially
BATT Training	San Francisco Bay Area Required Training	Initially/Annually
Chemical Hygiene Plan	1910.1450(f)	Initially and as determined by employer
Confined Space Entry - Rescue Personnel	1910.146(g) 1910.146(k)(1)(iii)	Initially/Annually
Confined Space Entry - Entry Supervisor, Entrant, and Standby Attendant	1910.146(g)	Initially
Contamination Control	1910.120(k)	Initially
Control of Hazardous Energy	1910.147(c)(7)	Initially/Modifications
CPR	1910.151(b) 1910.146(k)(1)(iv)	Initially/Annually
DOT/IATA	49 CFR 172, Subpart G	Initially/Every 2-3 years
Fire Prevention Plans	1910.38(b)(4)	Initially/Modification
Fire Extinguisher Training	1910.157(g) fire fighters only 1910.252(a)(2)(iii)(B)	Initially/Annually
First Aid	1910.151(b) 1910.146(k)(1)(iv)	Every Three Years
Forklift Training	1910.178(l)	Initially/Annually in California
Ground Fault Protection Implementation	1926.404(b)	Competent Person Requirement
Hazard Communication	1910.1200(h)(2) 172.704(a)(3)(ii)	Initially/when hazards change
HAZWOPER - 24 Hr OJT	1910.120(e)(3)(i)	Field experience with supervision
HAZWOPER - 8 Hr Manager/Supervisor	1910.120(e)(4)	Specialized training
HAZWOPER - Haz Waste Site Emergency Response	1910.120(e)(7)	Training required for expected employee responses to anticipated emergencies

EHS TRAINING AND COMPETENT PERSON REQUIREMENTS

EHS TRAINING REQUIREMENTS (Cont'd)

REQUIREMENT	REFERENCE	COMMENT(S)
HAZWOPER - 40 Hour	1910.120(e)(3)(i)	Off site/Before work
Hearing Conservation	1910.95(k)	Initially/Annually
Hot Work Supervisor	1910.252(a)(2)(iv)	Initially
Power Operated Hand Tools	1926.302(e)	Initially
Powered Platforms	1910.66(i)(1)	Initially
PPE	1910.132(d)	Initially, retraining per OSHA standard
Process Safety Management	1910.119(g) 1910.119(j)(3) 1910.119(i)(2)	Initially and Every Three Years; and upon Modification
Records Access	1910.20(g)	Initially/Annually
Resistance Welding Equipment Operation and Maintenance	1910.255(a) & (d)	Initially
Respiratory Protection	1910.134	Initially/When respiratory protection requirements change
Respirator Fit Test	Annual fit testing is not a regulatory requirement, but a standard industry practice	Initially/Annually
Servicing Rim Wheels	1910.177(c)	Initially
Stairways and Ladders	1926.1060(a) & (b)	Initially and as needed
Vertical Standards	1910.1001 – Asbestos 1910.1018 – Arsenic 1910.1025 – Lead 1910.1027 – Cadmium 1910.1028 – Benzene 1910.1030 – Bloodborne 1910.1048 – Formaldehyde	Initially/Annually
Waste Management Training	40 CFR 264.16 and 265.16	Annually

EHS TRAINING AND COMPETENT PERSON REQUIREMENTS

COMPETENT PERSON REQUIREMENTS

REQUIREMENT	REFERENCE	COMMENT(S)
Approval of PPE or other controls to maintain exposures below PELs	1910.1000(e)	Qualified Person Requirement
Buildup roofing safety monitoring system	1926.502(p)(7)	Competent Person Requirement
Crane/Derrick Inspections	1926.550 (a)(5) 1926.550 9(g)(5)(iv) 1926.550 (g)(5)(vi)	Competent Person Requirements
Cranes (2 or more used to lift the same load)	1910.179 (n)(3)(ix)	Qualified Person Requirement
Cutting or welding on flammable surface	1926.354(a)	Competent Person Requirement
Employee Training for Ladders and Stairways	1926.1060	Competent Person Requirement
Examining Damaged Excavations Protection	1926.652(d)(3)	Competent Person Requirements
Excavation Competent Person Training	1926.651	Competent Person Requirement
Excavation Inspections	1926.651(h)(2)& (h)(3) 1926.651(k)	Competent Person Requirement
Excavation Competent Person Training	1926.651	Competent Person Requirement
Explosives and Blasting Agents	1910.109(c)(5)(viii) 1910.109 (d)(2)(iii)(b) 1910.109(g)(5)(vii)	Competent Person Requirement
Fall Protection	1926, Subpart M	Competent Person Requirement
Ground Fault Protection Implementation	1926.404(b)	Competent Person Requirement
Hazardous Waste Site Preliminary Evaluation	1910.120 (c)(2)	Qualified Person Requirement
Inspections During Demolition	1926.850(g)	Competent Person Requirement
Ladder Inspections	1926.1053(b)(16)	Competent Person Requirement
Mechanical Demolition	1926.805(a) 1926.859(g)	Competent Person Requirement
Personnel Platform Design	1926.550 (g)(4)(i)(A)	Qualified Person Requirement
Pre-demolition Engineering Surveys	1926.850(a)	Competent Person Requirement

EHS TRAINING AND COMPETENT PERSON REQUIREMENTS

COMPETENT PERSON REQUIREMENTS (Cont'd)

REQUIREMENT	REFERENCE	COMMENT(S)
Asbestos	1926.1101	Competent Person Requirement
Blasting Operations	1926.900	Competent Person Requirement
Cadmium	1926.1127	Competent Person Requirement
Ladder Inspections	1926.1053	Competent Person Requirement
Lead	1926.62	Competent Person Requirement
Rigging Inspections	1926.251	Competent Person Requirement
Scaffolding	1926.451(a)	Competent Person Requirement
Slings	1910.184(d) & (e)	Competent person designation for preuse inspections
Soil Classification for Excavations	1926.652 (a)(1)(ii)	Competent Person Requirements
Structural Ramps in Excavations	1926.652, Appendix A	
Use of Air Monitoring Equipment	1926.51 (c)(1)(i)	Competent Person Requirement
Variance Procedure	1910.1044, APPB 1910.1045, APPB 1910.1047, APPB 1926.55 (b)	Qualified Person Requirement

EHS TRAINING AND COMPETENT PERSON REQUIREMENTS

COMPETENT PERSON REQUIREMENTS (Cont'd)

This definition, combined with duties and responsibilities, indicate four important factors associated with Competent Persons:

- They must be designated
- Their major role is to perform inspections
- They must be capable of recognizing hazards
- They must have authority to promptly correct hazards.
-

In addition to these general requirements, specific OSHA standards place more detailed responsibilities on the competent persons. Some of these standards are listed on the attached tables. Examples include the duties under the Asbestos, Lead, Excavation and Scaffold standards. Responsibilities under such standards may be to specify and approve equipment, work methods or hazard controls and to conduct employee training.

Except in the case of the Asbestos standard, OSHA does not specify training requirements for the Competent Person. Even in the case of Asbestos, the Agency recognizes that attendance at the training course does not in and of itself fulfill the 'competency' requirement. In fact, it is recognized that under some of the standards, the Competent Person duties may be filled by more than one person, depending on the skills and knowledge needed. For instance, the Competent Person designated for scaffold erection, may not be the same as the individual designated for scaffold inspection before each work shift. Also, different individuals may be designated competent persons depending on the type of scaffold used.

EHS 1-11 requires that the Project Manager, with the assistance of EHS personnel, ensure that personnel assigned to the project meet the competent and qualified persons requirements identified in EHS Plans. Since the qualifications of the Competent Persons are performance as opposed to specification based, it is up to the PM to determine what the qualifications of the designated persons need to be. This will depend on the hazards and complexity of the job, and the knowledge, experience and authority of the person. The Competent Persons should also be aware of the technical requirements of the OSHA standard they are being designated under. For example, the Competent Person for excavations may need to be capable of performing soils analysis required by the rule, and of selecting slope or bench angles consistent with the soil type.

Generally, the competent person will be the ESS or the superintendent, provided they have the capabilities in the given area. However, in certain cases, a craft employee may be best, as in the requirement for daily crane inspections. Generally, the PM should use the following checklist to evaluate the qualifications of the designated CP:

- ✓ Understands duties and responsibilities
- ✓ Has training
- ✓ Has knowledge and skill to assume the task
- ✓ Is familiar with standards
- ✓ Is given authority to function on the job
- ✓ Is provided with and reviews applicable standards and procedures
- ✓ Is provided with necessary equipment/materials

When an individual has the basic knowledge and skills to do the job, but needs a higher level familiarity with OSHA standards, training can be arranged on a project basis through the PESM.


TETRA TECH EC, INC.
EHS TRAINING COURSE SIGN-IN SHEET

<input checked="" type="checkbox"/> Name of Course:	<input checked="" type="checkbox"/> Location:	Course Duration:	<input checked="" type="checkbox"/> Date:
Topics Covered (list or attach agenda):		3.	
1.		4.	
2.		5.	
<input checked="" type="checkbox"/> Instructors: Instructor signature authorizes Electronic-signature on	1. (Print Name)	(Sign Name)	
	2. (Print Name)	(Sign Name)	
	3. (Print Name)	(Sign Name)	

ATTENDEES

<input checked="" type="checkbox"/> *Employee Number	<input checked="" type="checkbox"/> Print Name	<input checked="" type="checkbox"/> Sign Name	Job Title	Location to mail certificate	<input checked="" type="checkbox"/> Grade (Filled out by instructor only)	
					Grade	Initials
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						
16.						

Failure to provide all necessary information will hold up training certificate distribution.

EHS TRAINING COURSE EVALUATION SHEET

Name of Course: _____

Date: _____ Location: _____

Instructors: 1. _____ 2. _____
3. _____ 4. _____

Please evaluate the following elements of the course by circling the corresponding number

	Excellent	Very Good	Average	Fair	Poor
1. How did you find the physical arrangements, such as class size, lighting, ability to hear instructor, etc.?	5	4	3	2	1
2. How useful were the audiovisuals (slides, video-tapes, overheads) in learning the material?	5	4	3	2	1
3. How useful did you find the practical exercises?	5	4	3	2	1
4. How well did the instructors present the material?	5	4	3	2	1
5. Which 2 topics were covered best? _____ _____					
6. Which 2 topics could have been explained better? Why? _____ _____					
7. Which 2 topics did you find unnecessary? Why? _____ _____					
8. What is your impression of the speaker's effectiveness in delivering the material? _____ _____					
9. What is your impression of the speaker's presentation? _____ _____					
10. What is your overall impression of the course? _____ _____ _____ _____ _____					

Name (optional): _____

EHS 3-2 : Procedures - Environmental, Health & Safety Plan(s)

**Last Revision By: Kennedy Lugo on
04/28/2011**

Created By: Lisa Kaminski on 06/11/2008

Purpose:	The purpose of this procedure is to establish requirements regarding the preparation, approval, and maintenance of site environmental, health and safety (EHS) plans.		
Version Date:	04/28/2011 - Revised	Original Issue Date:	02/01/95
Category:	Company Procedures	Sections:	ESQ - Environmental Health & Safety Programs
Sub Category:	Departmental/Discipline	Document Type:	Procedure
Keyword Index:	Change Management/Contract, EHS Compliance/Waste Management, EHS Compliance/Spill Reporting, Field Activities/Environmental H&S, Field Activities/Science, Training, Communication, Monitoring, Operational Control	Document Owner:	Grey Coppi
Approved By:			

▼ **Table of Contents**

See Below



1.0 PURPOSE

The purpose of this procedure is to establish requirements regarding the preparation, approval, and maintenance of site environmental, health and safety (EHS) plans.



2.0 SCOPE

This Procedure applies to all Tetra Tech EC, Inc. (the Company) field projects that have environmental, health, and/or safety risks or EHS regulatory requirements associated with the scope of work.

EHS plans include, but are not limited to, environmental protection plans, waste management plans, regulatory compliance plans, stormwater management plans, stormwater pollution prevention plans, spill prevention countermeasure and control plans, contingency plans, emergency response plans, hazmat security plans, office Emergency Action Plans, incident prevention plans, industrial hygiene monitoring plans and health and safety plans or other project documents that incorporate EHS requirements.

An EHS plan for a project can consist of multiple plans for various EHS aspects of the project, be a single integrated EHS plan, and/or be integrated into the work plan or other project documents.



3.0 MINIMUM REQUIREMENTS

3.1 Responsibilities

General responsibilities EHS Program Implementation are contained in EHS 1-1, Responsibilities for Program

Implementation.

3.1.1 Line Management

Line Management, including Operations Managers and Project Managers (PM), is responsible for ensuring:

- a. The identification of site-specific EHS plans during the planning phase of the project in accordance with CRL Procedure, PO-1, Project Management Planning.
- b. That site-specific EHS plan(s) have the required approvals before any site work is conducted.
- c. That the Project Environmental and Safety Manager (PESM) and Environmental and Safety Supervisor (ESS) is informed of project changes which require modifications to the site EHS plan(s).

The Site Manager, superintendent, or field operations lead is responsible for ensuring the field implementation of the site EHS plan(s).

3.1.2 Environmental, Health and Safety Personnel

Procedure specific responsibilities are:

1. The Director, EHS Services:
 - a. Approves PESMs for field projects.
2. Project Environmental Safety Manager (PESMs) shall be a senior EHS Scientist or above. The PESMs:
 - a. Ensure that the EHS plan(s) are thorough, comprehensive, and prepared by individuals having an appropriate knowledge of safety, health, or industrial hygiene, and who recognize the potential for foreseeable incidents/injuries.
 - b. Ensure that the site EHS plan(s) meets special requirements such as U.S. Department of Defense (DoD) requirements, U.S. Department of Energy (DOE) requirements, U.S. Army Corp of Engineers (ACOE) requirements, state regulations, Occupational Safety and Health Administration (OSHA), and contract-specific EHS requirements.
 - c. Approve the site EHS plan(s) [and subsequent revisions](#).
 - d. Ensure that the ESS understands the requirements and implements the EHS plan.
3. Environmental and Safety Supervisors (ESSs):
 - a. Conduct EHS activities specified in site EHS plan(s) as assigned.
 - b. Identify operational changes which require modifications to the site EHS plan(s).
 - c. Ensure that plan modifications are documented and are approved by the PESM.
 - d. Ensure site specific training on the plans and the training required by the plans is completed for site personnel, including subcontractors and records are maintained.

3.2 Specific Requirements

Projects are required to operate in conformance with applicable federal, state, or local laws and regulations, permits, and approvals, and applicable TtEC [procedure](#)(s). A site-specific EHS plan(s) is required for each project managed by TtEC that:

- a. Involves field work with more than incidental access when without escort or working under another existing equivalent plan.
- b. Has safety, health, and/or occupational or environmental risks associated with its work scope.

3.2.1 Health & Safety Plans

Project Health & Safety Plans are to include:

- a. Project Information including Project Name on each page.

- b. Scope of work and applicability.
- c. Organization and responsibilities (for hazardous or complex site).
- d. Hazards Analysis and Controls, including hazards identified in the TIP.
- e. Emergency Preparedness Procedures including injury reporting and case management.
- f. Training and Qualification requirements.
- g. Medical requirements if applicable.
- h. Revision number or date (on each page).
- i. Other elements if required by regulations, such as OSHA regulations 29 CFR 1910 Occupational Safety and Health Standards, or 10 CFR 1926 Safety & Health Regulations for Construction.
- j. Plan Approval.

3.2.2 Environmental Plans

Environmental plans shall be prepared in accordance with client and environmental regulations and approved by the PESM (or designee) or stamped by a Registered Professional Engineer (PE). These plans shall address the environmental risks identified in the TIP.

Environmental Plans shall include:

- a. Project Information
- b. Organizational structure and responsibilities.
- c. Revision number or date of approval.
- d. Citation to the Federal, State or Local Regulations or Permits that are addressed.
- e. When required by regulations, will be stamped by a Registered Engineer.
- f. On projects where hazardous materials are being disposed of, clear definition of who will prepare and/or sign waste manifests (refer to EHS 1-8 Waste Documentation and Environmental Permits).
- g. Responsibilities and responses required for environmental events, including notification of regulatory agencies.
- h. Controls and Best Practices that will be applied to prevent environmental upsets or releases.

3.3 Plan(s) Approval

The Line Manager responsible for work completion in the field and the PESM (for Plans other than environmental plans that are signed by a PE) must approve EHS Plans.

- a. Projects involving potential exposure to radiological hazards must have the additional approval of the Company Health Physics Manager or designee in accordance with EHS 4-3, Radioactive and Mixed Waste Programs.
- b. Projects that have potential UXO hazards, involve blasting, or involve the use of explosives as defined in or covered by 29 CFR 1926, Subpart U, must have the additional approval of the UXO EHS Manager or designee and conform with the requirements of TtEC UXO Procedures.
- c. Projects conducting underwater work, which includes the use of divers as defined or covered by 29 CFR 1910, Subpart T, must have the additional approval of a qualified individual with commercial diving experience or who meets the qualifications requirements of 29 CFR 1910.410. (See Procedure EHS 2-2, Corporate Dive Safe Practice Manual). The Director, EHS Services, shall identify the individuals.

3.4 Plan Modifications

EHS Plans(s) shall be modified whenever scope or other changes in the project require:

- a. Modification of EHS controls
- b. Conformance with new or additional regulatory requirements.

3.5 Training

Site-specific training given to employees, including subcontractors, shall focus on the applicable topics addressed in EHS 1-11, Training, Section 3.3, Site-Specific Training for Workers. Evidence of training must be maintained in project files.

3.6 Hazard Assessment for PPE Selection

TtEC EHS Plans will be the written workplace hazard assessment to meet the requirements of 29 CFR 1910.132(d)(2). The hazard assessment shall meet the requirements of 29 CFR 1910.132, 29 CFR 1926.95, EHS 5-1, Personal Protective Equipment, and EHS 5-2, Respiratory Protection Program.

4.0 GUIDELINES

4.1 Environmental Health and Safety Plans

Environmental, health and safety (EHS) plans are a risk management tool which identifies the environmental, health, and/or safety risks and the regulatory requirements [for the](#) project. The plans specify measures to mitigate risk, to prevent and control losses, and to comply with EHS laws, regulations and guidance. It is suggested that the detailed checklists of CRL Procedures EHS 3-3, EHS Inspections, along with the approved project TIP be used as guidance for preparing the EHS Plans to ensure completeness.

4.1.1 Additional Project Specific Conditions

Projects with the following applicable conditions or Regulations will determine the type and detail level of the Health and Safety Plans. These include:

- a. Involves hazardous waste or meets the scope of 29 Code of Federal Regulations CFR 1910.120. (These projects are to have an EHS plan which complies with the requirements of 29 CFR 1910.120).
- b. Manages or generates waste. (These projects are required to have waste management requirements documented in a plan or other document, which describes characterize, store, handle, treat, and dispose of project waste streams).
- c. Involves corrective action for an underground storage tank. (These projects will identify applicable requirements for conducting closure/corrective action including, waste management and permitting, and for addressing closure standards).
- d. Involves other activities that are permitted or regulated by EHS laws or regulations.

4.2 Health & Safety Plan Content

The content of each plan(s) shall be appropriate for the scope and complexity of each project.

For field projects that do not involve hazardous waste or meet the scope of 29 CFR 1910.120 and have low risk (such as siting studies; wetland, biota, soil/geotechnical or cultural resource surveys; stream water quality sampling, etc.), an abbreviated EHS Plan, also called an Incident Prevention Plan (IPP) is usually sufficient. Attachment 1 provides a template for IPPs.

Projects for which an IPP is appropriate are often of limited scope, budget and duration, but may take place in remote areas and involve significant off-road driving, hiking, or the use of all-terrain vehicles (ATVs) or boats. There is also the potential for encounters with wildlife and exposure to dangerous weather conditions. The IPP must address these risks, including training for using off-road vehicles, how to maintain contact, and

emergency procedures.

All plans should address site emergency response and actions as directed in EHS 2-1, Emergency Preparedness, or provide a separate emergency action plan. Attachment 2 is provided (voluntary) for use when an injury or incident occurs.

4.2.1 Mitigation and Hierarchy of Controls

Once project hazards have been identified and evaluated, specific controls are to be established in the EHS plan(s) based on the following:

4.2.2 Engineering Controls remove or mitigate hazards by initial design specifications or by applying:

- a. Substitution methods, such as using less hazardous materials
- b. Isolation
- c. Guarding
- d. Limit switches
- e. Process substitution
- f. Enclosure
- g. Ventilation
- h. And other feasible means for minimizing exposure to hazards

4.2.3 Administrative controls reduce employee exposures through work procedures such as:

- a. Written safety policies and procedures
- b. Workplace rules
- c. Worker rotation
- d. Education and training with the goal of reducing the duration, frequency, and severity of exposure to hazards in the workplace

Administrative controls are considered less effective than engineering controls in that they do not usually eliminate the hazard. Rather, they lessen the duration and frequency of exposure to the risk condition. Although administrative controls can (and should) always be used to control employee exposure, they cannot be relied upon to reduce exposure all the time.

4.2.4 Work practice controls limit employee hazard exposure to within safe limits by describing how a task should be performed.

Work practice controls minimize the exposure of workers to risk conditions and depend on constant employee implementation or intervention. Appropriate work practices can be a vital aid in reducing worker exposures.

The following typical work practice controls can be used on projects:

- a. Good work practices on the part of the workers, including the proper use of equipment, tools, and controls established.
- b. Getting help in performing lifting tasks.
- c. Personal and industrial hygiene practices
- d. Routine inspection and maintenance of equipment and tools to prevent leaks, breaks.
- e. Having necessary equipment, tools, and supplies readily available at the job site to discourage using whatever is on hand to perform the task.
- f. Proper housekeeping for tools and work areas. (Reducing clutter reduces the chances for an accident and minimizes the effects.

4.2.5 Personal Protective Equipment (PPE) is worn by employees to protect them from the environment. In most cases, the least effective controls are PPE, as the worker is still exposed to the risk factor. When feasible, attempts will be made to find engineered or administrative actions that ensure greater hazard control.

TtEC construction projects typically require basic PPE to be used in the work areas at all times. The typical PPE required on construction projects includes:

- a. Hardhats
- b. Safety glasses with side shields
- c. Clothing appropriate for work activities, coveralls, etc.
- d. Substantial footwear, work boots

- e. Full length trousers, shirts with sleeves

TtEC recognizes that administrative, engineering, and other types of controls (including PE) are not mutually exclusive. Projects may need to use multiple types of controls to prevent or reduce employee exposure.

The project also ensures that controls implemented are:

- a. Appropriate to the project site's hazards.
- b. Addressed in periodic briefings and training sessions.
- c. Understood and followed by all affected employees.
- d. Equitably enforced through the disciplinary system.

Whichever controls projects employ, they are observed and evaluations are conducted by supervision and safety personnel to ensure controls are working as planned or if changes need to be made.

4.3 Voluntary Protection Program (VPP) Sites

Projects participating in or applying for OSHA VPP status may have additional requirements and rigor, including employee involvement, training, and self-assessment. These details can be found in the TtEC Projects VPP Program description in the Corporate Reference Library.

4.4 Templates and Short Forms

The TtEC Templates Library contains several EHS Plans that provide a starting point for developing project specific plans. These templates include a wide variety of plans covering project activities, such as site investigation, wildlife surveys, clean construction, remedial construction, building demolition, wind farm construction and others. Also included in the templates library is a blank Short Form Health and Safety Plan. This Short Form plan provides a simple to use checklist/plan in the blanks template that will assist in completing many standard hazardous waste related actions that are not subject to Army Corps of Engineers requirements. The Templates Library site can be accessed via the TtEC network at:

http://gp1.tteci.net/QuickPlace/templatelibrary/PageLibrary852570C7005D838C.nsf/h_Toc/4a2f664a6e0bc28d8?Open Document

Special attention must be paid to project traceability, revision number or date, and approval requirements when modifying template library documents for project use.

5.0 REFERENCES

Please Describe Your Reference Here	Place Your Link in this Column
1. 29 CFR 1910, Hazardous Waste Operations and Emergency Response, Final Rule	http://www.osha.gov/
2. 29 CFR 1926, Safety and Health Standards for the	http://www.osha.gov/

Construction Industry	
3. EHS 1-1, Responsibilities for Program Implementation	
4. EHS 1-8, Waste Documentation and Environmental Permits	
5. EHS 1-11, Training	
6. EHS 2-1, Emergency Preparedness	
7. EHS 3-3, EHS Inspections	
8. EHS 2-2, Corporate Dive Safe Practice Manual	
9. EHS 3-5, Activity Hazard Analysis	
10. EHS 4-3, Radioactive and Mixed Waste Programs	
11. EHS 5-1, Personal Protective Equipment	
12. EHS 5-2, Respiratory Protection Equipment	
13. PO-1, Project Management Planning	
14. PR-1, Procedures, Authorization, Preparation &	

Distribution	
15. OSHA (U.S. Department of Labor, Occupational Safety and Health Administration)	http://www.osha.gov/
16. US EPA (Environmental Protection Agency)	http://www.EPA.gov/
17. TtEC Projects Voluntary Protection Program	
18. TtEC Templates Library	http://gp1.tteci.net/QuickPlace/templatelibrary/PageLibrary852570C7005D838C.nsf/h_Toc/4a2?Open Document
19. USCOE EM-385-1-1 Nov 2003 Safety & Health Requirements Manual with changes	http://www.usace.army.mil/publications/eng-manuals/em385-1-1/toc.htm

6.0 ATTACHMENTS

Please Provide A Description of the Attachment	Place Your Attachments Here
1. Incident Prevention Plan Template	 EHS 3-2 Attachment 1 2011.doc
2. Contract & Medical Data Form Example	 EHS 3-2 Attach 2 - Medical Data Sheet 8-26-08.doc

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Proprietary Information



INCIDENT PREVENTION PLAN		
1. GENERAL INFORMATION		
Client Name:		
Project Location:	Project Number:	
Project Manager:	ESS:	
2. Work Scope		
3. PROJECT TASKS, POTENTIAL HAZARDS, AND CONTROL MEASURES (Or Attach Relevant AHA)		
TASK(S)	POTENTIAL SAFETY AND HEALTH HAZARD(S)	CONTROL MEASURE(S) SUCH AS MEDICAL OR TRAINING/QUALIFICATIONS, WORK PRACTICES, OR PPE*
4. EMERGENCY INFORMATION (Or Attach Client or other Plans that meet requirements – Ref EHS 2-1)		
<ul style="list-style-type: none"> • Location of emergency facilities: (Hospital, WorkCare approved Clinics – Attach phone numbers, Maps & Directions) • Emergency notification procedures - Include phone # if not 911: _____ • Alarm System/Types: • Procedure to Account for Personnel: • First Aid/CPR Trained Individuals Names, FA Kit location: • Evacuation routes and rally point(s): • WorkCare Phone: 800-455-6155 (24 hour) • Additional information: (contact Phone numbers, etc.) 		
5. INCIDENT PREVENTION PLAN SIGNOFFS		
Prepared by:	Date:	Phone #
PESM Approval:	Date:	Phone #
Project Manager Approval:	Date:	Phone #

* PPE identified in this plan was selected in accordance with 29 CFR 1910.132 and additional TtEC requirements.



EHS 3-2 Attachment 2 Example

Contact & Medical Data Sheet

(Voluntary)

This brief data sheet should be completed by all on-site personnel and kept by the Site Supervisor or ESS during site operations. Your health & safety is our priority. Under HIPPA you are entitled to complete privacy in regards to your medical information. The information you provide below will be used only if a medical necessity arises and shared only with those who would need to know to assist in addressing the medical and/or workers compensation event.

Name: _____ Date: _____

Home Phone: _____

Age: _____

Name of Emergency Contact: _____

Emergency Contact Phone #: _____

Drug Allergies or Other Allergies: _____

Do You Wear Contacts? _____

Are there any Recent Major Illnesses or On-going Medical Conditions that we should be aware of? _____

What Medications are you presently using? _____

Do you have any medical restrictions? _____

Personal Physician Name: _____

Address: _____

Phone #: _____

**This form may contain personal or sensitive information – Protect Accordingly!
Destroy when no longer needed.**

EHS 3-15 : Underground Utilities

**Last Revision By: Deborah Rambarose on
05/12/2010
Created By: Deborah Rambarose on
04/03/2002**

Purpose:	This program provides requirements and recommendations relative to identification, location, avoidance, and management of underground utilities, appurtenances, and structures during intrusive activities.		
Version Date:	05/16/2002 - Revised	Original Issue Date:	02/20/2002
Category:	Company Procedures	Sections:	ESQ - Environmental Health & Safety Programs
Sub Category:	Departmental/Discipline	Document Type:	Procedure
Keyword Index:	EHS Compliance/Waste Management, Field Activities/Science, Operational Control, Training, Monitoring	Document Owner:	Grey Coppi
Approved By:			

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 - Attachment B – Underground Utilities Management Checklist



1.0 PURPOSE

This program provides requirements for identification, location, and avoidance of underground utilities, appurtenances, and structures during intrusive activities, as defined in Section 4.0. The program also addresses actions to be taken in response to encountering or contacting underground utilities.



2.0 SCOPE

These requirements are applicable to all Tetra Tech EC, Inc. (TtEC) operations. The procedures address the requirements and recommendations for identifying and locating, working around, and encountering or contacting underground utilities.



3.0 MAINTENANCE

The Director, Environmental, Safety and Quality (ESQ) Programs, is responsible for updating this procedure. Approval authority rests with TtEC's President and Chief Executive Officer. Suggestions for revision shall be submitted to both the department responsible for updating the procedure and the Executive Director Compliance and Corporate Counsel.



4.0 DEFINITIONS



4.1 Aggressive Methods

The use of mechanized equipment such as excavators, backhoes, drill rigs, directional drilling, road saws, etc. Non-Aggressive methods involve the use of manual or non-mechanized methods such as hand-digging with shovels and air/hydro/vacuum methods.



4.2 Buffer Zone

As defined in this procedure, the area around a utility where only non-aggressive excavation methods may be utilized, unless specific conditions are met.

The definition cited above, and the excavation requirements and restrictions associated with it, will vary depending on the particular state regulations. TtEC requires the imposition of a four-foot Buffer Zone on all sides of the utility as measured from the outside edges of the utility, both horizontally and vertically. Since most jurisdictions recognize Buffer Zones which vary somewhere in the range of 18 to 36 inches, this distance must be verified by consulting the applicable state regulations before excavating so that adjustments to surface markings can be made to achieve the TtEC-required four-foot buffer zone.

Referred to as the "Tolerance Zone", "Safety Zone", or "Approximate Location of Underground Utilities" in some jurisdictions.

Information relative to excavation within the buffer zone is contained in Section 5.2.2.4.



4.3 Competent Person

A Competent Person has the ability to recognize hazards associated with underground utilities and the authority to stop or direct operations to ensure the safety of personnel and conformance with this procedure. The Competent Person has an understanding of this procedure, and the "One-Call" system requirements for the jurisdiction where excavation is occurring. The Competent Person must be capable of notifying One-Call agencies and maintaining and tracking One-Call Locate Numbers. Additionally, they must have knowledge of methods and work practices for utility identification, avoidance, and protection.



4.4 De-Energize

As applicable to a utility, to physically eliminate and/or prevent the presence, transmission, flow, or release of energy or materials which may cause harm to personnel or property.



4.5 Excavation

An operation for the purpose of movement or removal of earth, rock, or the materials in the ground, including but not limited to; digging, blasting, augering, backfilling, test boring, drilling, pile driving, directional drilling, grading, plowing-in, hammering, pulling-in, jacking-in, trenching, tunneling, structural demolition, milling, scraping, tree and root removal (grubbing), fence or sign post installation. TtEC requires that the designated One-Call agency for the applicable jurisdiction be contacted any time an intrusive activity is planned.



4.6 Jurisdiction

The authority having legal jurisdiction relative to regulations and requirements for notification of excavation activities and associated identification and marking. In the United States, the states have jurisdiction, and most consider the regulations applicable when excavation is to be performed in any location, including any public or private way, any company right-of-way or easement, or any public or privately owned land or way.



4.7 Locate

To indicate the existence of a utility by establishing a mark through the use of flags, pins, stakes, paint, or some other customary manner, that approximately determines the location of a line or facility.



4.8 Locate Request

A communication between an entity performing intrusive activities and a utility marking agency (One-Call, etc).



4.9 Observer

The person assigned to visually monitor and, as needed, signal the operator during mechanized intrusive activity when the activity is occurring within four feet of the outside edge of the buffer zone. This person remains in close communication with the equipment operator(s) and will stop the activity if needed.



4.10 One-Call Agency

An entity that administers a system through which a person can notify owners/operators of underground lines or utilities of the intent to perform intrusive activities in proposed public areas.



4.11 Positive Response

Communication with the entity performing intrusive activities, prior to the activity, to ensure that all contacted (typically via the One-Call agency) owner/operators have located and marked the underground utilities.



4.12 Potholing

The practice of exposing an underground facility by safe, non-aggressive excavation methods in order to ascertain the precise horizontal and vertical position and orientation of underground lines or utilities.



4.13 Underground Utility

An underground or submerged conductor, pipe, or structure used in providing electric or communications service (including but not limited to, traffic control loops and similar underground or submerged devices), or an underground or submerged pipe used in carrying, providing, or gathering gas, oil or oil product, sewage, storm drainage, water or other liquid service (including, but not limited to, irrigation systems), and appurtenances thereto. As used in this procedure, utility includes all underground appurtenances and structures.

The following are examples of the types of underground utilities that may be present in a given location:

- Natural gas pipelines
- High voltage electric cables
- Water pipelines
- Fiber optic telecommunications lines
- Steam pipelines
- Gasoline, oil, or other fuels
- Sewer pipelines
- Hazardous Materials
- Underground Storage Tanks (USTs)
- Abandoned underground structures containing hazardous materials, hazardous wastes, and radioactive materials

Note: Electrical and pressurized mechanical underground utilities that are not energized shall be considered as applicable to the requirements of this procedure until they are disconnected and removed or protected by a lockout/tagout system approved by TtEC (see Section 5.2.2.6)



4.14 Underground Utility Owner

Any person, utility, municipality, authority, political subdivision or other person or entity who owns, operates, or controls the operation of an underground line/facility.



4.15 White Lining

The practice whereby the entity which intends to perform intrusive activities pre-marks the site with an outline of the area where intrusive activities will occur. This involves the use of white paint, flags, stakes, or a combination thereof to mark the extent of where work is to be performed. The marking may vary depending on what intrusive activities are to be conducted. For example, for general excavation, an areal outline of the excavation shall be marked, while for drilling, the individual boreholes shall be marked. Studies have shown that pre-marking is a practice that does prevent utility contact incidents.



5.0 DISCUSSION



5.1 Responsibilities



5.1.1 Competent Person

The Competent Person shall be responsible for:

- Obtaining a copy of, and understanding the applicable regulations for the state of jurisdiction where the excavation activities are to be performed.
- Contacting the appropriate One-Call agency or private locating service, as applicable.
- Recording One-Call locate numbers.
- If necessary, renewing One-Call locate numbers before expiration.
- Ensuring that white-lining of the area to be excavated is performed.
- Ensuring that a “positive response” has been received from every utility owner/operator identified by the One-Call agency and that they have located their underground utilities and have appropriately marked any potential conflicts with the areas of planned intrusive activities.
- Completion of the *Underground Utilities Locating and Marking Checklist* (Attachment A) and the *Underground Utilities Management Checklist* (Attachment B).
- Reviewing applicable AHAs with all project members before work begins.
- Conducting training on communication protocols to be used by the excavation observer and equipment operator.
- Ensuring Implementation of appropriate work practices during intrusive activities (including maintaining the prescribed buffer zone for use of aggressive methods).
- Conducting daily inspections of the excavation area to make sure that all markings are intact.
- Maintaining required records.
- Providing the Environmental and Safety Supervisor (ESS) with all required documentation on a daily basis.



5.1.2 Observer

Whenever intrusive operations with mechanized equipment are being conducted within four feet of the outside edge of the buffer zone, horizontally and vertically, an observer must be assigned to monitor the activities. The observer is responsible for:

- Observing the operation to ensure that the operator stops operations if utilities are observed.
- Reviewing hand signals and other forms of communication with the operator.
- Properly signaling the operator.
- Stopping the operation immediately if the observer’s attention must be diverted even momentarily.
- Stopping the operation immediately if a hand signal or other directive is not followed. Operations will not resume until the observer and operator mutually agree that the reason(s) for not complying with the directive(s) are/is identified and fully corrected.
- Maintaining required records, such as logbook entries, or other, as requested by line management.



5.1.3 Line Management

The Project Manager (PM) shall be responsible for:

- Ensuring compliance with this procedure.
- Providing the necessary resources for compliance with this procedure.
- Designating Competent Personnel in consultation with the Project Environmental, Health and Safety Manager (PESM) prior to the start of work.



5.1.4 Environmental, Health and Safety Personnel

The Environmental and Safety Supervisor (ESS) shall be responsible for:

- Providing oversight on the implementation of the requirements contained in this procedure.
- Consulting with the PM and Competent Person on underground utility issues.

5.2 Procedure

The following sections provide the requirements and recommendations of this procedure, which are intended to prevent injury to personnel, damage to infrastructure, and associated indirect effects associated with encountering or contacting underground utilities during the execution of intrusive work. Underground utilities present multiple potential hazards that must be recognized before and during work which occurs near them, therefore, this procedure is divided into sections addressing underground utility identification and location, working around or near underground utilities, and actions to be taken in the event that underground utilities are encountered or contacted. Hazards that may be presented by underground utilities include explosion and fire, electrocution, toxic exposures, pathogens, and drowning.

5.2.1 Identifying and Locating Underground Utilities

The possibility of the existence of underground utilities must be evaluated as early as possible in the planning phase for any project which involves intrusive activities, as defined in Section 4.2. The Task Initiation Procedure (TIP) form should be used for documentation of the identification of this potential hazard and the procedures to be followed to address them. The following sections describe various methods for identifying and locating utilities on a site. Plans should be verified during the readiness review. The *Underground Utilities Locating and Marking Checklist* (Attachment A) and the *Underground Utilities Management Checklist* (Attachment B) must be completed before any activities meeting the definition of excavation in Section 4.2 are conducted. Attachment A is intended to be used as a guide during the process of locating and marking utilities in the area to be excavated. Attachment B is intended to be used as a guide in the overall process of underground utilities management during the course of the project.

All underground utilities on a site involving excavation as defined in Section 4.4, must be located and identified before intrusive activities commence, by one or more of the following entities:

- The Utility Owner
- A Private or Public Utility Locating Service
- An Approved TtEC Competent Person

These options are described in greater detail in the following Sub-Sections:

5.2.1.1 Pre-Planning and the Site EHSP

- The Site-Specific Environmental Health and Safety Plan (EHSP) developed for the project must:
- Identify the location and types of underground utilities that are believed to be present on the site.
- Reference this procedure (EHS 3-15), and describe how it will be implemented on the project.
- Contain an Activity Hazard Analysis in which the hazards associated with underground utilities are identified, as well as the measures used to control them.
- Contain, as an appendix, a copy of the applicable regulations from the state of jurisdiction where excavation activities are to be performed. These can usually be obtained via the Internet.
- Contain clear and concise procedures to be followed in the event that contact with underground utilities occurs.
- Address underground utilities and potential associated scenarios in the emergency response section of the EHSP.

5.2.1.2 “One-Call” Locating and Marking Services

Every state has utility marking service programs having various names such as “One-Call”, “Dig-Safe”, “Call-Before-You-Dig”, “Dig-Safely”, and many others. These services will identify the types and locations of any utility that may exist in an area to be excavated, as long as the property is in the public domain.

- The appropriate One-Call service for the jurisdiction where the project is located must be contacted prior to beginning excavation work. The One-Call agency should be given as detailed a description of the property as possible; address, cross street, utility pole numbers, physical description, etc.
- Notification to the One-Call service shall allow sufficient lead time for the agency to mark the utilities before excavation begins. The lead times vary, but range from two to ten days, depending on the state of jurisdiction.
- A complete listing of One-Call agencies and telephone numbers for all states is available in the “*Call-Before-You-Dig Call Center Directory*”, which can be accessed on the Internet at the WebPage (<http://www.agc.org/galleries/default-file/State%20One%20call%20Centers%20Laws.doc>) sponsored by “*Underground Focus*” magazine.
- Once notified, the One-Call agency will provide the contractor with a unique “locate number” or

“reference number”. This reference number must be kept in the project files by the Competent Person or designee. Additionally, the reference numbers have expiration dates, which may vary depending on the particular One-Call agency. The valid period of the locate number and required renew notification date shall be requested from the One-Call agency.

- On a project with multiple contractors, each contractor must request a separate locate number. Under no circumstances will any other contractor or entity be allowed to “work under our locate number”. Subcontractors to TtEC may excavate under the locate number secured by TtEC, provided that they are excavating within the area which was previously white-lined by TtEC and subsequently marked. **However, the One-Call agency must be contacted and notified of this arrangement so that the subcontractor can be recorded as working under the existing locate number.** If a TtEC subcontractor will be excavating in an area not white-lined by TtEC, then the TtEC subcontractor must request a new locate.
- The area where work is to be performed shall be white-lined by TtEC personnel before the locating service goes to the site.
- It is good practice to arrange a pre-excavation meeting at the project site with the personnel performing the utility location and marking. This meeting will facilitate communications, coordinate the marking with actual excavation, and assure identification of high-priority utilities.
- The One-Call agency should provide the identities of the utility owners that will be notified of the locate request. This information shall be recorded on the Underground Utility Locating and Marking Checklist (Appendix A) and maintained in the project files. The contact person and phone number for each utility owner shall also be recorded.
- The utility owners should provide a “positive response” relative to the locate request, which can consist of two types of action by the utility owner. The facility owner or operator is required to 1) mark it’s underground utilities with stakes, paint, or flags, or 2) notify the excavator that the utility owner/operator has no underground utilities in the area of the excavation.
- The positive responses shall be recorded on the Underground Utility Locating and Marking Checklist (Appendix A) and cross-checked with the list of utility owners that the One-Call agency stated that they would notify. If it is discovered that a utility owner has not provided a positive response, then the One-Call agency must be notified.
- Excavation shall not be conducted until positive responses have been received from all utility owners identified by the One-Call agency as having underground utilities on the property.
- Before beginning excavation, the excavator must verify that the location marked was correct, and the distinct, color-coded markings of all utility owners are present.
- Examine the site to check for any visible signs of underground utilities that have not been located and marked such as pedestals, risers, meters, warning signs, manholes, pull boxes, valve boxes, patched asphalt or concrete pavement, areas of subsidence, fresh sod or grass, lack of grass or vegetation, and new trench lines.
- The markings placed by the utility owners must be documented by TtEC using a still, digital, or video camera. The photo-documentation shall be maintained with the project files indefinitely.
- The markings placed by the utility owners or marking services shall follow the American Public Works Association Uniform Color Code as described in ANSI Standard Z 535.1. This code appears below.

American Public Works Association Uniform Color Code

Red		Electric Power Lines, Cables, Conduit
Orange		Communications, Telephone, Cable TV
Yellow		Gas, Oil, Steam, Petroleum or Gaseous Materials
Green		Sewers and Drains
Blue		Potable Water Systems
Purple		Reclaimed Water, Irrigation, Slurry Lines
Pink		Temporary Survey Markings
White		Proposed Excavation

5.2.1.3 Private Utility Locating and Marking Services

- As discussed in Section 5.2.1.1, One-Call agencies arrange for the identification and marking of underground utilities only on public property, up to the point of contact with private property. In the event that excavation activities are to be conducted on non-public properties, [the presence](#), location,

depth, and orientation of all underground utilities within the white-lined area shall be ascertained through records review, including any site plot plans, utility layout plans, and as-built drawings available from the property owner, as well as through interviews with knowledgeable personnel associated with the property. Additionally, the information gathered from these sources shall be verified by physical detection methods (non-aggressive), performance of a geophysical survey, or by procuring the services of a private utility locating and marking service. If any detection methods are to be self-performed, the requirements of 5.2.1.4, must be followed.

The above requirements are also intended to address the potential presence of unknown or undocumented underground utilities, therefore, the area to be excavated must also be evaluated by the PM to determine if the potential for unknown or undocumented underground utilities exist. If the determination is made that the presence of these unknown or undocumented underground utilities is unlikely, then a variance should be requested to eliminate the requirement to identify them.

A list of vendors providing locating and marking services can be found in the “*Network of Underground Damage Prevention Professionals*” which can be accessed on the Internet at the “*Underspace*” WebPage (<http://underspace.com/index.htm>).

- Variance to this requirement above must be approved by the PM and PESM.



5.2.1.4 Self-Performance of Utility Locating and Marking

The techniques and instruments used to locate and characterize underground utilities can be extremely complicated and difficult to use effectively. Additionally, interpretation of the data generated by this instrumentation can be difficult. The utility marking services described in 5.2.1.1 and 5.2.1.2 are staffed by well-trained, experienced professionals who perform locating activities on a regular basis. For these reasons, it is most desirable that these professional services are used for utility location and marking on projects.

- In some instances, such as long-term projects where excavation is a primary task, and the presence of underground utilities is extensive, it may be prudent to self-perform locating and marking activities.
- If locating and marking is to be self-performed, all personnel using instrumentation will be trained on the use of the equipment that will be used, and the interpretation of the data.
- There are variety of locating methods which may be utilized for self-performance of utility locating as categorized below:
 - Magnetic field-based locators or path tracers
 - Buried electronic marker systems (EMS)
 - Ground penetration radar-based buried –structure detectors
 - Acoustics-based plastic pipe locators
 - Active probes, beacons, or sondes for non-metallic pipes
 - Magnetic polyethylene pipe
- Before self-performing any underground utility locating on a project, approval must be obtained from the TtEC Director, EHS Services.



5.2.2 Working Near or Around Underground Utilities

After the site has been properly evaluated for the presence of underground utilities, intrusive activities may begin. Since there is no perfect way of eliminating the hazards presented by underground utilities, an effort must be made to perform the tasks following the direction and guidance as described by the following best practices that should be implemented during the execution of the project.



5.2.2.1 Work Site Review

Before beginning intrusive activities, a meeting shall be held between all members of the project team. This shall consist of a review of the marked utility locations with the equipment operators, observers, laborers, etc.



5.2.2.2 Preservation of Marks

During excavation, efforts must be made to preserve the markings placed by the utility owners until they are no longer required. If any markings are obliterated, the One-Call agency must be contacted for re-marking. No intrusive activities are to take place if markings are not visible.



5.2.2.3 Excavation Observer

Whenever intrusive operations are being conducted within four feet of the edge of the buffer zone, an observer must be assigned to monitor the activities. The observer will be designated each day, and a review of hand signals and other forms of communication between the observer and operator will be conducted. The directives of the observer will be followed precisely and immediately by those operating equipment.



5.2.2.4 Excavation Within The Buffer Zone

Performing intrusive activities within the buffer zone requires careful adherence to proper guidelines and procedures to minimize the risk of contact with underground utilities.

The purpose of the buffer zone is to designate and define an area where careful, prudent, and reasonable excavation practices are to be used to prevent contact with underground utilities. However, there may be occasions where it is necessary to perform aggressive excavation methods in this designated area.

The boundaries of the buffer zone as defined in Section 4.1 will be observed at all times during intrusive activities. Aggressive excavation methods (excavators, backhoes, drill rigs) must be restricted to areas outside of the 4-foot buffer zone unless a special exemption to this requirement is obtained.

Consider whether the objective of the project can be completed without performing intrusive activities in the buffer zone at all. This will greatly reduce the risks presented by performing work in close proximity to underground utilities. If after consideration, the determination is made that intrusive activities in the buffer zone are necessary, then a formal exemption request shall be made to the PESM according to the guidelines below.

A request to utilize aggressive excavation methods in the buffer zone may be made if:

- There is no other appropriate and reasonable alternative to using aggressive methods in the buffer zone; and
- The utility has been de-energized (and purged if necessary), verified as de-energized, and locked-out (per Section 5.2.2.6); or

- the depth and orientation of the utility has been adequately and visually determined through the use of non-aggressive methods such as air/hydro/vacuum excavation, potholing, probing, hand-digging, or a combination thereof; and

- for utilities containing electrical energy, the depth of the existing water table is below the location of the utility; and
- application for the exemption has been submitted to the PESM via a Field Change Notification (FCN); and
- the exemption has been granted and approved in writing by the PESM on the FCN form.

The following conditions will apply to this request:

- Aggressive methods may be used in the buffer zone only to the extent allowed by the applicable state or other jurisdictional regulations.
- Appropriate physical protection measures for exposed utilities as described in Section 5.2.2.5 shall be implemented to eliminate the potential for equipment contact with utilities.
- The extent of the project excavation area to be covered by the exemption request must be specified in the FCN.
- When evaluating the use of aggressive excavation methods in the buffer zone, the PESM will consider the type of utility involved and the associated risk potential.

Based on this evaluation, the PESM may impose further conditions and requirements, which will be detailed in the FCN.

Even if the above exemption conditions are met, the PESM has authority to deny the request, the reasons for which will be described in the FCN.

Unless exempted according to the above provisions of this procedure, only non-aggressive methods may be

used within the buffer zone. Non-aggressive, or non-mechanized equipment is used in order to prevent mechanical contact with underground utilities which could result in damage to the utility and create the potential for personal injury and property damage. Following are examples of non-aggressive excavation methods:

- Hand-digging
- Non-conductive hand tools must be used when digging within the buffer zone surrounding underground electrical utilities.
- If conductive hand tools must be used near electrical lines, then the PESM shall be consulted to determine additional requirements relative to safe electrical practices, procedures, and equipment.
- Hydro-excavation (water pressure).
- Air excavation (air pressure).
- Vacuum extraction (soil excavation/removal).
- Air excavation/vacuum extraction combination.
- Aggressive methods may be used for the removal of pavement over a utility, if allowed by the state regulations.

5.2.2.5 Protection of Underground Utilities

It is very important that consideration be given to the protection of underground utilities when performing adjacent intrusive activities. This is necessary not only to prevent physical damage and associated indirect effects, but also to prevent the potential for injury to employees and the public.

- When using aggressive excavation methods within the buffer zone around exposed underground utilities, physical protection may be appropriate. Basically, this involves creation of a physical barrier between the mechanized operation and the utility. The following are some possible types of physical protective measures:
 - Heavy timbers, similar to swamp mats.
 - Sheets of plywood.
 - Blasting mats.
- Once exposed, underground utilities no longer have the support provided by surrounding soil and may need to be physically supported to prevent shifting, bending, separation, or collapse, which could result in damage to the utility, and possibly personnel. Following are suggested support methods:
 - Timber shoring underneath the utility.
 - Timbers or girders over the top of the excavation fitted with hangers that support the utility.
 - Design by a PE for complicated or large applications.
- Utilities must also be protected from objects that may fall into the excavation such as rocks and equipment. This can be accomplished by following these guidelines:
 - Cast spoils as far away from the excavation as possible. Excavated and loose materials shall be kept two feet from the edge of excavations, as required by OSHA.
 - Relocate large rocks, cobbles, and boulders away from the excavation and sloped spoils piles.
 - When vehicles and machinery are operating adjacent to excavations, warning systems such as soil berms, stop logs or barricades shall be utilized to prevent vehicles from entering the excavation or trench.
 - Scaling or barricades shall be used to prevent rock and soils from falling into the excavation.
 - Barriers shall be provided to prevent personnel from inadvertently falling into an excavation.

5.2.2.6 De-Energizing Utilities

Utilities can carry many types of potential energy, including electricity, flowing liquids, liquids under pressure, gasses under pressure, etc. A release, such as may happen if a utility conveyance is compromised, could result in personal injury, property damage, and other indirect effects. If the white lines of the proposed excavation area overlaps or extends into the buffer zone of a known underground utility, then if at all possible, that utility shall be de-energized to physically prevent the transmission, flow, or release of energy. Conversely, if the buffer zone of the known utility lies outside of the white-lined, proposed excavation area, then de-energization is not required.

- The owner of the utility shall be contacted to determine the feasibility and methodology of de-energizing the utility. Plenty of lead-time should be provided for this since it may take utility companies weeks to de-energize some utilities.
- Depending on the utility and the material being conveyed, isolation points which may be suitable for de-energizing include but are not limited to the following:
 - Electrical circuit breakers
 - Slide gate

- Disconnect switches
- Piping flanges
- Other similar devices
- When utilities are de-energized, it must be verified by demonstration. This can be accomplished by testing equipment, switching on a machine or lighting, opening a valve, etc. For any current-carrying electrical equipment, such as cables, electrical panels, etc., successful de-energization must be certified through the use of appropriate electrical testing equipment.
- Whenever a utility is de-energized, a means of ensuring that the energy isolation device and equipment cannot be operated until the device is removed must be provided. Typically, this is achieved by utilizing a lockout device, accompanied by a written tag, that physically controls the configuration of the energy isolation point. Lockout devices include but are not limited to the following:
 - Locks
 - Chains
 - Valve covers
 - Circuit breaker hasps
 - Blind flanges
 - Slip blinds, and
 - Multiple lock hasps
- When de-energizing and locking out of utilities is practiced, the provisions of EHS 6-4 Lockout/Tagout, shall be followed, as applicable.
- In the event that a utility is de-energized, but there is no means of adequately providing a physical locking-out of the utility, then a spotter must be posted at the point of isolation to ensure that the utility is not re-energized. The spotter must be supplied with a communication device such as a site radio.

5.2.2.7 Damage Discovery

During excavation, utility damage may be discovered which is pre-existing or otherwise not related to a known contact. Disclosure to the utility owner is very important because the possibility of utility failure or endangerment of the surrounding population increases when damage has occurred. The utility may not immediately fail as a result of damage, but the utility owner or operator must be afforded the opportunity to inspect the utility and make a damage assessment and effect repairs if necessary. The following guidance applies:

- Observe and photograph the utility from a safe distance and determine if there is damage. Damage would be all breaks, leaks, nicks, dents, gouges, grooves, or other damages to utility lines, conduits, coatings, or cathodic protection systems.
- The One-Call agency or private location service must be contacted immediately.

5.2.3 Encountering or Contacting Underground Utilities

In the event that encountering or contacting an underground utility occurs, it is imperative that the appropriate actions are taken to minimize damage to the utility, prevent personal injury, and minimize indirect effects.

5.2.3.1 Encountering Underground Utilities

It is possible that underground utilities will be encountered in locations that have previously been “cleared” of having underground utilities by the locating service, or are found outside of the area which has been marked as having underground utilities. In either case, if this occurs, the following applies:

- Intrusive activities must be curtailed
- The One-Call agency or private location service must be contacted immediately
- The PM and PESM must be notified
- No further intrusive activities may be conducted until:
 - The One-Call agency/private location service and/or the subject utility owner visit the site;
 - Identification of the utility owner and the type of material/energy being conveyed by the utility has been made; and
 - The orientation and depth of the subject utility has been determined and suitably marked.
- A TtEC Incident Report and Investigation form must be completed per EHS 1-7. The report should be accompanied by photographs clearly showing the marking(s), and the actual location, with a distance gauge to document how far off the mark the utility was encountered.

5.2.3.2 Contacting Underground Utilities

If excavation or other equipment being used for intrusive activities makes contact with an underground utility, the following guidelines apply:

- Intrusive activities must be stopped immediately.
- Observe the utility from a safe distance and determine if there is damage. Damage would be all breaks, leaks, nicks, dents, gouges, grooves, scratched coatings, cathodic protection compromise, material leakage, obvious electrical energy.
- Move all personnel to the evacuation meeting point as described in the SSHP.

EXCEPTION: If an electrical line has been contacted and it is your belief that equipment (such as an excavator) is electrically energized, do not approach the equipment. Order the operator to remain in the equipment until emergency personnel can de-energize the source (unless the equipment is on fire, at which time the operator should jump off of the vehicle and shuffle along the ground to a safe area). Shuffling is required because current flows outward through the soil in a ripple pattern called a power gradient, creating a pattern of high and low potential. Shuffling decreases the chance that these gradients could be bridged, causing current to flow through the body, resulting in electrocution.

- Secure the area to prevent the public from entering.
- Contact emergency responders as specified in the SSHP.
- The One-Call agency or if known, the utility owner must be contacted immediately.
- The PM and PESM must be notified.
- No further intrusive activities may be conducted until:
 - The utility owner inspects the scene and after repairs, verifies that all danger has passed.
 - The orientation and depth of the subject utility has been determined and suitably marked.
 - Permission from the emergency responders to resume work has been given.
 - A TtEC Incident Report and Investigation form must be completed per EHS 1-7. The report should be accompanied by photographs clearly showing the marking(s), and the actual location, with a distance gauge to document how far off the mark the utility was encountered.
 - State and Local regulations must be reviewed to determine if reporting to any additional agencies is required.

5.3 Training

Competent Persons shall have adequate experience and/or training to carry out the requirements of this procedure.

6.0 SOURCES OF INFORMATION

6.1 Organizations

- Common Ground Alliance
- Center for Subsurface Strategic Action (CSSA)
- DigSafely
- National Utility Contractors Association (NUCA)
- National Utility Locating Contractors Association (NULCA)
- Underground Focus Magazine
- NUCA State Listing of One-Call centers
- Utility Safety Magazine

6.2 Vendors and Commercial Sites

- RadioDetection, Inc. (Detection Instruments)
- Heath Consultants (Detection Instruments)
- Ben Meadows Company (Detection Instruments)
- So-Deep, Inc. (Complete Utilities Services)
- Concept Engineering Group, Inc. (Air Excavation Equipment)
- Rycom Instruments, Inc. (Detection Instruments)
- Schonstedt Instrument Company (Detection Instruments)
- Forestry Suppliers, Inc. (Fiberglass Probe – “Fiberglass Tile Probe”, Part #77543, Approx. \$20.00, Telephone 800-647-5368)

7.0 REFERENCES

- Common Ground Study of One-Call Systems and Damage Prevention Best Practices, August, 1999, Sponsored by US DOT.

8.0 ATTACHMENTS

Attachment A – Underground Utilities Locating and Marking Checklist
Attachment B – Underground Utilities Management Checklist

ATTACHMENT 1
Tetra Tech EC, Inc.
EHS 3-15 - ATTACHMENT A
UNDERGROUND UTILITIES LOCATING AND MARKING CHECKLIST

Click the icon below to launch or download.



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Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

ATTACHMENT 2
Tetra Tech EC, Inc.
EHS 3-15 - ATTACHMENT B
UNDERGROUND UTILITIES MANAGEMENT CHECKLIST

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Tetra Tech EC, Inc.

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**EHS 3-15 - ATTACHMENT A
UNDERGROUND UTILITY LOCATING AND MARKING CHECKLIST**



TETRA TECH EC, INC.

**To be Completed by PM and/or "Competent Person"
Complete Form as Location/Marking Progresses and Maintain in Site Files**

PROJECT INFORMATION:	Location:
Project Name:	Task/Activity:
Tetra Tech EC Competent Person:	Start Date of Work:
Tetra Tech EC Subcontractor: <input type="checkbox"/> No <input type="checkbox"/> Yes:	Private Locating Service Required: <input type="checkbox"/> Yes <input type="checkbox"/> No
Property Owner:	If Not, Explain:
NOTIFICATION:	
Locating Service Name:	Locating Service Tel. Number:
Date Locating Service Notified:	Locate Ticket Number:
Address of Property to be Marked:	Locate Ticket Expiration Date:
Nearest Intersecting Street:	
Are There Any Utilities on the Properties That the Locating Service Will Not Contact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Specify:	
<i>Enter Utility Information in Table 1 Below. In Addition to Utility Locating Services, Consult Client, Utility Owners, Drawings, Facility Personnel, Maintenance Personnel, Municipalities, etc.</i>	

**TABLE 1
ON-SITE UTILITY INFORMATION**

NAME OF UTILITY COMPANY	TYPE OF UTILITY	COLOR CODE	UTILITY PRESENT ON-SITE?	EMERGENCY PHONE NUMBER	DATE MARKS COMPLETED
	Electric	RED			
	Communications, Phone, CATV	ORANGE			
	Gas, Oil, Steam, Petroleum	YELLOW			
	Sewers, Drains	GREEN			
	Potable Water	BLUE			
	Reclaimed Water, Irrigation	PURPLE			
	Temporary Survey Markings	PINK			
To be performed by excavator prior to utility mark-out.	Proposed Excavation	WHITE			

White-Lining Completed? No Explain: _____ Yes: Date: _____ By Whom? _____

LOCATING AND MARKING:

Have All Utilities Identified in Table 1 Been Marked? Yes No (If Not, Contact Locating Service for Resolution)
Problem(s) With Markings?

Yes No No Marks Incorrect Location Too Wide
 Other: _____ Not All Utilities Marked Per Table 1 (notify marking service)

Measurements Taken: Yes No
Documentation of Marks: Photos Video Other: _____

EXCAVATION:

Utilities Accurately Marked? Yes No
If no, describe: _____
Were Unmarked or Mis-Marked Utilities Encountered? Yes No
If Yes, Specify: _____
Locating Service Notified? Yes No
Will Excavation Continue Past Locate Number Expiration? Yes No
If Yes, Locate Number Renewed? Yes No New Expiration Date: _____
Any Other Problems/Concerns? Specify: _____

Form Completed By:	Signature:	Date:
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EHS 3-15 - ATTACHMENT B

UNDERGROUND UTILITIES MANAGEMENT CHECKLIST



**To be Completed by PM and/or “Competent Person”
Complete Form as Project Progresses and Maintain in Site Files.**

PHASE	TASK	Y E S	N O	N A	COMMENTS Required if Response is No or NA. (Reference Item Number)
Pre-Planning	1. Excavation in Work Scope? (As defined in EHS 3-15, Section 4.4)				
	2. Underground Utilities Identified in TIP?				
	3. Competent Person Assigned?				
	4. Has a Copy of the Applicable State Regulations Been Obtained, Read, Understood?				
	5. EHS Plan Addresses Underground Utilities? (AHAs, Contingency Plan, State Regulations Appendix)				
Identifying, Locating and Marking	6. Locating and Marking Checklist Initiated? (Attachment A)				
	7. Identification and Address of Property Determined, Including Nearest Intersection?				
	8. One-Call Agency Contacted?				
	9. Additional Locating and Marking Required on Property? (One-Call agency marks to public property line only)				
	10. Additional Marker/Locator Identified?				
	11. Additional Marker/Locator Qualified?				
	12. TtEC Self-Performing Location and Marking?				
	13. If Yes to 12 Above, Approval From TtEC Director EHS Services?				
	14. Area of Excavation “White-Lined” by TtEC?				
	15. TtEC Present When Markings Completed?				
	16. All Utilities Marked? (Refer to Attachment A, Table 1)				
	17. All Markings Photo/Video Documented?				
	18. Area Checked for Signs of Previous Excavation? (subsidence, new grass, patching, etc)				
	19. All Applicable Information Recorded on Attachment A?				
	20. Multiple Contractors Excavating On-Site?				
	21. Separate Locate Requests for All Contractors?				
	22. TtEC Subcontractors Excavating in TtEC White-Lined Area(s)?				
	23. If Yes to 22 Above, One-Call Agency Contacted to Determine if TtEC Subcontractor Can be Added to Existing Locate Ticket?				
Excavation Activities	24. Meeting and Site Walk-Over Conducted with Project Personnel? (Managers, Equipment Operators, Laborers, Competent Person, Excavation Observer, etc)				
	25. AHA and EHSP Review Conducted With Personnel?				
	26. Do Site Activities Have Potential to Obliterate Utility Markings?				
Excavation Activities – Cont’d	27. If Yes to 26 Above, Have Provisions Been Made to Preserve Markings?				

EHS 3-15 - ATTACHMENT B

UNDERGROUND UTILITIES MANAGEMENT CHECKLIST

PHASE	TASK	Y E S	N O	N A	COMMENTS Required if Response is No or NA. (Reference Item Number)
	28. Has an Excavation Observer Been Designated to Monitor Excavation When Occurring within 4 Feet of the Buffer Zone?				
	29. Have Operator and Observer Reviewed Commands and Signals?				
	30. Has TrEC-Required 4-Foot Buffer Zone Been Marked on Either Side of Markings Placed by Locator?				
Excavation Within Buffer Zone	31. Is Excavation Within The Buffer Zone Absolutely Necessary?				
	32. If Yes to 31 Above, Can Non-Aggressive Methods Be Used For Excavation In The Buffer Zone? If Yes, Identify Appropriate Non-Aggressive Methods.				
	33. If No to 32 Above, Has a Buffer Zone Exemption Request (FCN) Been Approved by The PESM? If No, then Aggressive Methods May Not Be Used in The Buffer Zone.				
	34. If Yes to 33 Above, Has the Utility Been De-Energized, Purged, Verified/Tested, and Locked-Out? Or, Has The Depth and Orientation of the Utility Been Adequately and Visually Determined Through The Use of Non-Aggressive Methods?				
	35. If Yes to 34 Above, Have All of The Following Conditions Been Met? For Utilities Containing Electrical Energy, Is The Depth of The Water Table Below The Depth of The Utility? Have Regulations Been Consulted to Determine Specific State Requirements Relative to Excavating in The Buffer Zone? Have Appropriate Physical Protection Measures Been Implemented to Prevent Equipment Contact With Utilities and to Prevent Damage to Utilities? Has The FCN Requesting The Buffer Zone Exemption Been Signed by The PESM? If No to Any of The Above Conditions, Then Only Non-Aggressive Excavation Methods May Conducted in The Buffer Zone, Since The Conditions of The Exemption Have Not Been Satisfied.				
Working Around Exposed Utilities	36. If Necessary, Have Provisions Been Made to Support the Utility During Work Activities?				
	37. Have Spoils Been Placed as far Away From the Excavation as Feasible?				
	38. Has the Utility Been De-Energized? (If Any Portion of the 4-Foot Buffer Zone around a Utility is Inside of the White-Lined Area)				
	39. Has the Isolation Point for the De-Energized Utility Been Physically Locked-Out?				
Working Around Exposed Utilities -Cont'd	40. If No to 39 Above, Has a Spotter Been Assigned to Monitor Isolation Point?				
	41. If Yes to 40 Above, Does the Spotter Have Adequate Communications? (Radio, Telephone, etc)				
	42. Has the Isolation Point Been Tagged?				
Damage Discovery	43. Has Pre-Existing Damage to a Utility Been Discovered During Excavation?				
	44. If Yes to 43 Above, Has the One-Call Agency and/or Utility Owner Been Notified?				
	45. If Yes to 43 Above, Have Photographs Been taken?				

EHS 3-15 - ATTACHMENT B

UNDERGROUND UTILITIES MANAGEMENT CHECKLIST

PHASE	TASK	Y E S	N O	N A	COMMENTS Required if Response is No or NA. (Reference Item Number)
Encountering or Contacting Underground Utilities	46. Have Utilities Been Encountered in Locations That Have Not Been Marked?				
	47. If Yes to 46 Above, Has the One-Call Agency or Other Locating Service Been Contacted?				
	48. If Yes to 46 Above, Has the PM and PESM Been Notified?				
	49. If Yes to 46 Above, Has a TtEC Incident Report per EHS 1-7 Been Completed? (Include Photographs)				
	50. Has Excavation Equipment Come In Contact With Underground utilities?				
	51. If Yes to 50 Above, Were Intrusive Activities Immediately Curtailed?				
	52. If Yes to 50 Above, Has a Damage Determination Been Made From a Safe Distance?				
	53. If Yes to 50 Above, Has the Area Been Secured?				
	54. If Yes to 50 Above, Have Emergency Responders Been Notified?				
	55. If Yes to 50 Above, Has the Locating Agency and/or Utility Owner Been Notified?				
	56. If Yes to 50 Above, Have State and Local Reporting Requirements Been Met?				
	57. If Yes to 50 Above, Were Intrusive Activities Curtailed Until; Inspection From Utility Owner, Orientation and Depth of Utility Was Determined and Marked, Permission From Emergency Responders Given?				
	58. If Yes to 50 Above, Has a TtFW Incident Report per EHS 1-7 Been Completed? (Include Photographs)				

CHECKLIST COMPLETED BY:

NAME

SIGNATURE

DATE

NAME

SIGNATURE

DATE

EHS 4-2 : Hazard Communication

**Last Revision By: Kennedy Lugo on
11/16/2010**

Created By: Lisa Kaminski on 03/01/2000

Purpose:	The purpose of this program is to ensure that employees understand the potential hazards of chemicals used in the workplace in accordance with the Hazard Communication Regulation (HAZCOM), 29 CFR 1910.1200.		
Version Date:	04/04/2000 - Revised	Original Issue Date:	02/01/95
Category:	Company Procedures	Sections:	ESQ - Environmental Health & Safety Programs
Sub Category:	Departmental/Discipline	Document Type:	Procedure
Keyword Index:	EHS Compliance/Waste Management, Communication, Training, Operational Control	Document Owner:	Grey Coppi
Approved By:			

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1.0 PURPOSE

The purpose of this program is to ensure that employees understand the potential hazards of chemicals used in the workplace in accordance with the Hazard Communication Regulation (HAZCOM), 29 CFR 1910.1200.



2.0 SCOPE

This program applies to all Tetra Tech EC, Inc. (TtEC) operations where employees have potential exposure to hazardous chemicals as a result of their normal job duties or a foreseeable emergency. This program does not apply to hazardous wastes. However, TtEC will provide employees with information on the potential hazards of wastes in accordance with 29 CFR 1910.120(e) and (i).



3.0 MAINTENANCE

The Director, Environmental, Safety and Quality (ESQ) Programs is responsible for updating this procedure. Approval authority rests with TtEC's President and Chief Executive Officer. Suggestions for revision shall be submitted to both the department responsible for updating the procedure and the Executive Director Compliance and Corporate Counsel.



4.0 DEFINITIONS



4.1 Chemical Manufacturer

A work place where chemical(s) are produced for use or distribution.



4.2 Exposed Worker

Any worker subjected to a hazardous chemical in the workplace through any route of entry (inhalation, ingestion, skin contact, absorption, etc.).



4.3 Foreseeable Emergency

Any potential occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that could result in an uncontrolled release of a hazardous chemical into the workplace.



4.4 Hazardous Chemical

Any chemical that constitutes a physical or health hazard. Chemicals with a label containing the words CAUTION, WARNING, or DANGER indicate the chemical is hazardous. Consumer products are not considered hazardous where it can be demonstrated that the products are used in the workplace in the same manner as for normal consumer use.



4.5 Material Safety Data Sheet (MSDS)

Written or printed material describing characteristics, hazards, and controls associated with a specific chemical or combination of chemicals.



4.6 Work Area

A room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.



5.0 DISCUSSION



5.1 Responsibilities



5.1.1 Environmental, Health and Safety Personnel

The Environmental Health and Safety Supervisor (ESS) or Office Environmental and Safety Coordinator (ESC) shall ensure that:

- A list(s) of hazardous chemicals is developed for each work site or office;
- A current MSDS is maintained on file;
- MSDSs are available to employees; and
- Employees understand how to read an MSDS, know the location of the MSDSs and understand the potential hazards of the chemicals with which they are working.



5.1.2 Procurement

Procurement personnel are responsible for ensuring that:

- An MSDS is received with all new shipments of hazardous chemicals;
- Contacting the supplier when an MSDS is not received; and
- A copy of the MSDS is forwarded to the ESS or ESC.



5.2 General Guidelines

The HAZCOM regulation sets requirements for information and training on hazardous chemicals used in the work place. Federal law requires that all states comply with hazard communication regulations, and many states and local governments have adopted their own "equally or more stringent" hazard communication standards. Therefore, applicable state and local requirements must be consulted when conducting projects in states that have their own standards. The following are guidelines for complying with federal requirements.



5.3 Labeling

The HAZCOM regulation requires that the employer ensure the following:

- Each container of hazardous chemicals in the work place is labeled, tagged, or marked with the following information:
 - Identity of the hazardous chemical(s);
 - Appropriate hazard warnings; and
 - Name and address of the chemical manufacturer, importer, or other responsible party.
- Existing labels on incoming containers of hazardous chemicals are not removed or defaced, unless the container is immediately marked with the required information.
- Labels or other forms of warning are legible, are in English, and are prominently displayed on the container, or readily available in the work area throughout each work shift.



5.3.1 Label Warning Systems

The types of common label warning systems are:

1. The National Fire Protection Association (NFPA) Standard defines five degrees of hazard in each of the following three categories: Emergency health hazard, fire hazard, and instability or reactivity hazard. NFPA warning labels are an acceptable means of labeling hazardous chemicals provided that employees are trained on the NFPA labeling system.

2. The Consumer Product Safety Commission requires precautionary labeling on every hazardous chemical intended for household use. Basic precautionary information and labeling terms have been identified by the Manufacturing Chemists Association including the following:

- Toxic
- Highly toxic
- Flammable
- Extremely flammable
- Corrosive
- Irritant
- Poison

3. The Department of Transportation (DOT) requires shipping containers of hazardous chemicals to be labeled in accordance with the appropriate hazard class. DOT has established nine hazard classes:

- | | |
|-------------------------------|-------------------------------------|
| • Explosives | • Poisons/infectious substances |
| • Gases | • Radioactive materials |
| • Flammable liquids | • Corrosives |
| • Flammable solids | • Miscellaneous hazardous materials |
| • Oxidizers/ Organic peroxide | |

All TtEC projects shall use the name of the hazardous chemical and the NFPA system for labeling portable and stationary containers that are not appropriately labeled. This includes containers that are for general use (e.g., gasoline cans) and containers that have materials transferred to them from original containers.

“Prop 65” rules in California require special warnings when personnel may be exposed to substances “Known to the State” to be carcinogens or reproductive hazards. If materials which are subject to “Prop 65” are used at a California site, review the warnings referenced below during the HAZCOM portion of site-specific training. In addition, the Site Environmental, Health and Safety (EHS) plans will identify contaminants of concern that fall under “Prop 65”.

- For exposure to a chemical known to the state to cause cancer:
“WARNING: This product contains a chemical known to the State of California to cause cancer.”
- For exposure to a chemical known to the state to cause reproductive toxicity:
“WARNING”: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.”



5.3.2 Personal Responsibilities

Personnel using or handling any chemical shall complete the following steps when handling chemicals:

1. Read the label on the container. If special instructions are provided, they will usually be part of the label;
2. Look for information concerning special precautions for personal protection;
3. Note appropriate first aid in case of an exposure;
4. Become familiar with the various types of labels and their warnings; and
5. Consult the MSDS for further warnings or requirements.



5.3.3 Specific Labeling Requirements

Hazardous substances that have specific labeling requirements under other standards include the following:

- Carcinogens
- Lead
- Asbestos
- Hydrogen, oxygen, and anhydrous ammonia
- Cotton dust
- Formaldehyde



5.4 Material Safety Data Sheets



5.4.1 General Information

The MSDS is used to relay chemical hazard information from the manufacturer/importer to the employer and employee. The HAZCOM regulation requires an MSDS for each hazardous material product an employee packages, handles, or transfers. The HAZCOM regulation does not require an MSDS sheet for hazardous wastes. Only those hazardous chemicals brought onto the job site by the contractor are required to have an MSDS sheet. However, the site-specific EHS plans will contain similar information on the known or potential site contaminants.



5.4.2 MSDS Contents

MSDSs that are received with incoming shipments of hazardous chemicals shall be maintained in an on-site file or office file by the ESS or ESC and shall be made available to all site or office employees. Each MSDS shall include the following information:

- Trade name of the chemical (if appropriate);
- Name, address, and telephone number for hazard and emergency information;
- Date of MSDS preparation;
- Chemical and common name of all ingredients;
- Occupational Safety and Health Administration (OSHA) permissible exposure limits, American Conference of Governmental Industrial Hygienists threshold limit values and other applicable limits;
- Physical and chemical characteristics;
- Physical hazards;
- Primary route(s) of entry into the body, such as inhalation, ingestion, or skin absorption;
- Acute and chronic health hazards, including signs and symptoms of exposure and medical conditions aggravated by exposure;
- Carcinogenic hazards;
- Emergency and first aid procedures;
- Precautions for safe handling and use; and
- Engineering/exposure control measures and personal protective equipment.

Attachment A provides an overview of the information contained in an MSDS.

Upon receipt of an MSDS (with a shipment of chemicals or otherwise) the following steps shall be performed:

1. The MSDS shall be given to the ESS or ESC who inspects it for completeness. If incomplete, the MSDS is returned to the manufacturer with a request for a complete MSDS. Attachment B or an equivalent should be used to contact the supplier or manufacturer. After sending the letter the supplier or manufacturer should be contacted by phone.
2. If the MSDS is complete, the ESS or ESC places a copy of the complete MSDS into the site project or office file.
3. If a revised version of an MSDS is received, the old version of the MSDS is stapled to the revised MSDS and placed in the site project or office file.

If no MSDS is received with a shipment of chemicals Attachment B or an equivalent shall be used to request an MSDS from the supplier or the manufacturer. After sending the letter, the supplier or manufacturer should be contacted by telephone.

Copies of all correspondence, telephone contact and MSDSs shall be maintained in the project or office files.

MSDSs are a good source of information for those seeking quick hazardous material references. In the case of emergencies, however, not all of the pertinent information is provided and at times the information may be more damaging than helpful. Response to any emergency requires quick judgement calls. If there is any question of which first aid procedures to follow, it is best to call the emergency number provided on each MSDS specific to the material in question.



5.5 Non-Routine Activities

All TtEC employees and subcontractors must be informed of the hazards associated with chemicals involved in non-routine activities. For the purpose of this guideline, non-routine activities include, but are not limited to, line breaking/pipe opening, confined space entry, tank cleaning, and other maintenance of process equipment.

Hazards of non-routine tasks are addressed in site-specific EHS plans and Activity Hazard Analyses and are reviewed with the work crew during phase preparatory meetings or daily briefings.



5.6 Employee Information and Training

Employee information and training shall be provided as part of the employee's EHS training. This documentation includes the initial hazardous waste training certificate and site-specific or office training documentation.

The following are required elements of the information and training program:

- An overview of HAZCOM;
- A review of any operations in their work areas that involve hazardous materials;
- The location and availability of the written Hazard Communication Program, including the list(s) of hazardous chemicals and MSDSs;
- Methods and observations that may be used for detecting the presence or release of hazardous chemicals;
- An understanding of the physical and health hazards of hazardous chemicals in the work area;
- How to understand the information in MSDSs;
- How to read the warnings on container labels including the NFPA system;
- When and how to report leaks and spills;
- How to recognize the symptoms of overexposure and how to protect against it; and
- How to implement exposure control methods including work practices, engineering controls, administrative controls, personal protective equipment, and emergency procedures.

Hazard communication training is provided during initial training, site-specific and office orientation, supervisor training, and 8-hour refresher training as specified in EHS 1-11, Training. Attachment C [or an equivalent may be used to document training and ensure training is in compliance with the Hazcom regulations.](#)

In the event that a new chemical hazard or new task is introduced in the workplace, the ESS or ESC shall conduct additional training that includes the following:

- Objectives of the task, if applicable;
- Physical and health hazards associated with the new chemical hazard or task;
- Methods to detect the presence or release of the hazardous chemicals;
- Procedures and practices recommended to protect themselves from the hazards;
- Emergency procedures in the event of a hazardous situation or exposure; and
- Location and availability of the written program, lists of chemicals, and MSDS.

Documentation is maintained for each employee trained in hazard communication in accordance with EHS, 1-9, Recordkeeping.



5.7 Subcontractors

Subcontractors working for TtEC shall be required to meet the EHS requirements outlined in their contracts. To help meet these requirements, subcontractors are informed of TtEC procedures by the ESS and instructed on where to find information on hazardous chemicals being used on the project.



6.0 REFERENCES

29 CFR 1910.1200, Hazard Communication.

49 CFR 100-181, Hazardous Materials Transportation.

Environmental, Health & Safety - Programs Procedure EHS 1-9, Recordkeeping 

Environmental, Health & Safety - Programs Procedure EHS 1-11, Training 

OSHA (U.S. Department of Labor, Occupational Safety and Health Administration)

U.S. Department of Transportation (DOT)



7.0 ATTACHMENTS

[Attachment A - MSDS Overview](#)

[Attachment B - MSDS Letter to Supplier or Manufacturer](#)

[Attachment C - Hazard Communication Checklist](#)



[EHS 4-2 ATTACHMENT A](#)

[MSDS OVERVIEW](#)

Click the icon below to [launch or download](#).



EHS 4-2 Attachment A.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.



[EHS 4-2 ATTACHMENT B](#)

[MSDS LETTER TO SUPPLIER OR MANUFACTURER](#)

Click the icon below to [launch or download](#).



EHS 4-2 Attachment B.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.



[EHS 4-2 ATTACHMENT C](#)

[HAZARD COMMUNICATION CHECKLIST](#)

Click the icon below to [launch or download](#).



EHS 4-2 Attachment C.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

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EHS 4-2 ATTACHMENT A

TETRA TECH EC, INC. MATERIAL SAFETY DATA SHEET OVERVIEW

The following is provided to aid in the understanding of a typical Material Safety Data Sheet (MSDS). The actual format of the MSDS may vary.

Section I gives the identity of the chemical as it is on the label. Included is the name and address of the company that makes or imports the chemical, the emergency phone numbers to call for emergency or additional information, and the date the MSDS was prepared.

Section II shows where you will find the hazardous component, chemical identification, and common names. Worker exposure limits to the Occupational Safety and Health Administration permissible exposure limits and American Conference of Governmental Industrial Hygienists threshold limit values and other recommended safe exposure limits are included. Even if the chemical makeup is a trade secret the safety precautions are still given.

Section III describes the physical and chemical characteristics of the hazardous chemical, which can be complicated. If there is uncertainty, a supervisor or a glossary of common terms should be consulted for a better understanding of how the items could effect you in different work situations.

- The boiling point and melting point is where a liquid at a certain temperature will change from liquid to breathable gas.
- Vapor pressure, vapor density, and evaporation rate are especially important for toxic gases and vapors.
- Solubility in water and specific gravity tells you if a chemical will dissolve in water, sink or float.

Section IV helps judge the risk of fires and explosions. The flash point refers to the minimum temperature needed to initiate explosive conditions. Flammability limits indicate the concentration of the substance in the form of a gas or vapor that is needed for the gas or vapor ignite. It also gives instructions as to what to use (e.g., water, CO₂ foam) to put out a fire and any special hazards associated with the fire fighting procedures.

Section V reveals the reactivity of the chemical, i.e., under what conditions it is stable or not stable. The data indicate how possible reactions may be reduced and describes spill prevention and storage precautions.

Section VI describes the chemical's primary route(s) of entry into the body (e.g., inhalation, ingestion) and presents exposure symptoms (e.g., headaches, nausea, dizziness and rashes). Some effects occur right after exposure (e.g., a skin burn), while others have long-term or chronic effects (e.g., cancer). It also tells of existing conditions such as asthma that can be made worse by exposure to the chemical. Lastly, first aid procedures are offered should you be exposed and become ill or injured.

Section VII provides precautions for a safe handling and use of the chemical, explaining what to do if there is a spill, leak, or any accidental release, the waste disposal methods to be taken, and any precautions in the handling and storage of the chemical.

Section VIII describes the protective clothing and equipment (e.g., respiratory, gloves, eye protection) that should be used with the chemical as well as the appropriate work/hygienic practices.

Many of the terms used in MSDSs can be abbreviated and are technical in nature. A glossary of common terms used in MSDSs can be used as an aid in comprehension.

**EHS 4-2 ATTACHMENT B
MSDS LETTER TO SUPPLIER OR MANUFACTURER**



Date

Manufacturer Name
Street Number
City, State Zip Code

Dear Sirs:

We recently received a shipment of chemicals from your firm that was deficient in the following:

____ No Material Safety Data Sheet (MSDS) was present for the chemicals received.

____ The MSDS received did not contain adequate information as follows.

Listed below are the products requiring the above information. Pursuant to 29 CFR 1910.1200, I respectfully request that the appropriate MSDS for these items be sent to the above address, marked to my attention. Your cooperation is greatly appreciated.

Sincerely,

TETRA TECH EC, INC.

ESS or ESC
Title

EHS 4-2 ATTACHMENT C



TETRA TECH EC, INC.

HAZARD COMMUNICATION CHECKLIST

Project/Office Name: _____

Location: _____ Date: _____

Form Completed By: _____

- ___ 1. Have we prepared a list of all the hazardous chemicals in our workplace?
- ___ 2. Are we prepared to update our hazardous chemical list?
- ___ 3. Have we obtained or developed a material safety data sheet (MSDS) for each hazardous chemical we use?
- ___ 4. Have we developed a system to ensure that all incoming hazardous chemicals are checked for proper labels and MSDS?
- ___ 5. Do we have procedures to ensure proper labeling or warning signs for containers that hold hazardous chemicals?
- ___ 6. Are our employees aware of specific information and training requirements of the Hazard Communication Standard?
- ___ 7. Are our employees familiar with the different types of chemicals and the hazards associated with them?
- ___ 8. Have our employees been informed of the hazards associated with performing nonroutine tasks?
- ___ 9. Do our employees understand how to detect the presence or release of hazardous chemicals in the workplace?
- ___ 10. Are employees trained about proper work practices and personal protective equipment in relation to the hazardous chemicals in their work areas?
- ___ 11. Does our training program provide information on appropriate first aid, emergency procedures, and the likely symptoms of overexposure?
- ___ 12. Does our training program explain the types of labels and warnings used in each work area?
- ___ 13. Does the training describe where to obtain data sheets and how employees may use them?
- ___ 14. Have we worked out a system to ensure that new employees are trained before beginning work?
- ___ 15. Have we developed a system to identify new hazardous chemicals before they are introduced into a work area?
- ___ 16. Do we have a system for informing employees when we learn of new hazards associated with a chemical we use?

EHS 4-5 : Medical Screening and Surveillance**Last Revision By: Kennedy Lugo on 11/16/2010****Created By: Lisa Kaminski on 11/13/2008**

Purpose:	The purpose of this program is to ensure that the Tetra Tech EC, Inc. (TtEC) medical screening and surveillance program addresses the needs of TtEC personnel, employee medical records are up-to-date and properly maintained, and that the TtEC medical surveillance program meets the requirements of applicable regulations.		
Version Date:	10/10/2008 - New	Original Issue Date:	02/01/95
Category:	Company Procedures	Sections:	ESQ - Environmental Health & Safety Programs
Sub Category:	Departmental/Discipline	Document Type:	Procedure
Keyword Index:	Monitoring, Operational Control, Training	Document Owner:	Grey Coppi
Approved By:			

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- 1.0 PURPOSE
- 2.0 SCOPE
- 3.0 MINIMUM REQUIREMENTS
- 4.0 GUIDANCE
- 5.0 REFERENCES
- 6.0 ATTACHMENTS

**1.0 PURPOSE**

The purpose of this program is to ensure that the Tetra Tech EC, Inc. (TtEC) medical screening and surveillance program addresses the needs of TtEC personnel, employee medical records are up-to-date and properly maintained, and that the TtEC medical surveillance program meets the requirements of applicable regulations.

**2.0 SCOPE**

This program applies to medical examinations and biological monitoring provided to TtEC personnel included in the TtEC medical screening and surveillance program. It is assumed all medical exams/tests necessary for a given project/site have been identified by a Project Environmental and Safety Manager (PESM).

**3.0 MINIMUM REQUIREMENTS****3.1 Responsibilities**

3.1.1 Director, Environmental, Safety & Quality (ESQ)

The Director, Environmental, Safety and Quality (ESQ) Services is responsible for updating this procedure.

The Director, ESQ shall periodically review the quality assurance and quality control program of the Corporate Medical Consultant (CMC). The Director, ESQ will also review and consider feedback from project or office managers, Environmental, Health and Safety (EHS) personnel, contracts personnel, Local Medical Providers (LMPs), and others when conducting reviews of the CMC.

3.1.2 Environmental, Health and Safety Personnel

The PESM assists in implementation of the program at TtEC offices and projects. The PESM assists the Environmental and Safety Supervisor (ESS) in defining additional medical surveillance parameters or biological monitoring for projects.

The ESS is responsible for ensuring that personnel working on a project have the required medical surveillance examinations and have current documentation of a qualified physician's opinion approving the worker for hazardous waste site work, asbestos work, and respirator qualification, as necessary.

3.1.3 Corporate Medical Consultant (CMC)

The CMC will be Board Certified in Occupational Medicine and will:

- Provide consultation to Director, ESQ regarding all aspects of the TtEC medical surveillance program;
- Manage the day-to-day operation of the program;
- Quality Local Medical Providers (LMPs);
- Review the work of the LMPs and perform selected clinic audits;
- Provide input to project specific medical surveillance parameters, as requested;
- Provide periodic status reports of the TtEC Medical Surveillance program to the Director, ESQ;
- Review and approve the fitness for duty for each TtEC employee as requested;
- Maintain all employee medical and exposure records;
- Notify the TtEC Director, ESQ of all requests for medical information;
- Develop, maintain and implement a quality assurance/quality control program.

3.2 Information Provided To The CMC

The Director, ESQ ensures that the CMC receives the following information required by the Occupational Safety and Health Administration (OSHA):

- Copies of OSHA 29 CFR 1910.120 and other applicable regulations;
- Copies of applicable EHS plans for the hazardous waste sites or other work locations, as requested;
- A copy of TtEC's medical surveillance program protocols and procedures; and
- Copies of personal exposure monitoring data or appropriate employee exposure data;
- Access to the job site if requested

The PESM shall ensure that the CMC receives project-specific medical surveillance requirements in advance of examination scheduling.

3.3 Scheduling of Initial Medical Surveillance Examinations

Exams are scheduled for those working on projects requiring medical clearance or initial testing per CFR 1910.120, contract or ES&H Plan. EHS personnel and Human Resources (HR) Department personnel are authorized to initiate medical surveillance examinations for TtEC personnel. The CMC should be contacted directly by EHS or HR and provided with the following information: the employee name, social security number, office or project location, phone number, preferred timeframe for the examination, type of examination required (pre-employment, baseline, periodic/annual, project specific or exit) and other special testing required. The CMC will then schedule the examination directly with the employee and the LMP and provide email confirmation of the examination appointment to the employee or the appropriate EHS representative in cases where email is not available.

Pre-employment drug screening and post-occurrence drug testing is carried out in accordance with the procedure PP-14, Substance Abuse Program.

3.4 CMC Procedures

When requested by the Director, ESQ or PESM, the CMC will qualify and recommend additional LMP for new offices or project locations. The CMC will maintain a current listing of all LMPs and will consult with the Director, ESQ when making changes to this listing.

The CMC shall provide detailed guidance to the LMPs regarding testing protocols, logistics, billing procedures, and quality assurance requirements. The CMC is responsible for ensuring that the LMPs follow the detailed guidance.

The CMC will obtain and furnish each TtEC employee and the ESS or office Environmental & Safety Coordinator (ESC), a written Work Status Report which includes the following:

- An opinion as to whether the employee has any detectable medical conditions which would place the employee at increased risk of material impairment of the employee's health from work in hazardous waste operations or emergency response, or from respirator use;
- The recommended limitations upon the employee's assigned work;
- The results of the medical examination and tests; and
- A statement that the employee has been informed by the physician of the results of the medical examination and any medical conditions which require further examination or treatment.

The CMC will complete a Certification for Hazardous Waste and Respirator Use following each hazardous waste examination and provide a copy to the ESS or ESC.

The CMC shall maintain an accurate record of all medical surveillance examinations performed for TtEC employees. All records shall be cataloged and maintained in secure, access controlled storage for the term of the contract. All employee medical records will be turned over to Director, ESQ or other designated medical facility on request.



4.0 GUIDANCE

4.1 Annual/Periodic Physical Examination Protocol

Employees should be provided an annual/periodic physical examination within 30 days of the anniversary of their previous physical examination if their job assignment still requires an exam per regulation, contract or ES&H plan specifics. Employees who wear a respirator less than 30 days/year or employees who are only involved in site visits, but not actual site work, may be on a 2-year periodicity for physical examinations as directed by the CMC. The contents of the annual medical examination are the same as the initial exam except as follows:

- Chest X-ray to be performed every five years unless the physician determines that increased periodicity is necessary.
- 12-lead resting EKG. The EKG will be performed according to the following schedule: every three years for those under the age of 40, every two years for those 40 to 50 years of age, and annually for those more than 50 years of age.

4.2 Termination/Reassignment Physical Examination Protocol

Physical examinations are made available to employees who participated in the medical surveillance program when they terminate employment with TtEC or upon reassignment to a job position which does not require participation in the program except as follows:

Hazardous Waste Site Activity Since Last Examination	Termination/Reassignment Examination Decision
No	Examination not offered unless required by project specifications or other OSHA standards
Yes	CMC will determine if examination is indicated unless required by project specification or other OSHA standards. The decision will be based upon the nature of the previous site(s)' contaminants and job

site activities, documented exposure levels, and/or the results of the previous medical examination.
--

The CMC will provide documentation for each employee's medical file for which a termination/reassignment examination was waived. The documentation will include the rationale for waiving the examination.

When termination/reassignment medical examinations are performed, the content shall be the same as for the annual/periodic examination except that the chest X-ray is to be performed unless one has been performed in the last 12 months.

Employees who do not wish to avail themselves of the termination/reassignment examination will be requested to complete and sign the Medical Examination Refusal form included as Attachment A. If the employee does not take the examination and does not sign the refusal form, then TtEC's efforts to make the examination available will be documented in the project and employee's medical file.

Project specifications may require exit examinations when personnel leave the project or when a project ends. If the CMC feels that the exit examination can be waived, then the client should be notified for concurrence and appropriate contract modifications made as necessary.

4.3 Biological Monitoring

Additional medical surveillance parameters and biological monitoring may be performed as appropriate based on the potential for exposures to specific chemicals during site activities. The PESM or ESS and the CMC will determine the need for additional medical surveillance and biological monitoring on a project-specific basis.

4.4 Injury or Illness Examinations

Any employee who is injured, becomes ill, or develops signs or symptoms due to possible overexposure involving hazardous substances or health hazards should be provided consultation and/or examination as directed by the CMC and PESM.

4.5 Return to Work Examinations

Return to work clearance should be obtained from the LMP for all occupational and nonoccupational injuries and illnesses which resulted in or involved:

- Hospitalization
- Five (5) lost workdays - days away from work
- Unconsciousness
- Seizures

Return to work clearances may also be required when indicated by the LMP, CMC, PESM, or the Human Resources Department.

4.6 Release of Medical Records

Employees who wish to obtain copies of medical records should notify the Director, ESQ Services, complete the Employee Release of Medical Records (Attachment B), and forward to the Director, ESQ Services.



5.0 REFERENCES

Please Describe Your Reference Here	Place Your Link in this Column
1. 29 CFR 1910.95, Occupational Noise Exposure	
2. 29 CFR 1910.120, Hazardous Waste Operations and Emergency	

Response	
3. 29 CFR.1926.1020, Access to Employee Exposure and Medical Records	
4. OSHA (U.S. Department of Labor, Occupational Safety and Health Administration)	
5.	
6.	
7.	



6.0 ATTACHMENTS

Please Provide a Description of the Attachment	Place Your Attachments Here
A. Medical Examination Refusal Form	 EHS 4-5 Attachment A.doc
B. Employee Release of Medical Records	 EHS 4-5 Attachment B.doc
C.	
D.	

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EHS 4-5 ATTACHMENT A



TETRA TECH EC, INC.

MEDICAL EXAMINATION REFUSAL FORM

I, _____, acknowledge the Tetra Tech EC, Inc. (TtEC) has instructed me, and has provided me with full opportunity, to take an exit medical exam upon termination of my employment at the _____ Project Site(s)/TtEC office. I understand that this exam was offered to me at no charge. I also understand that this exam is an important part of the Health and Safety Program for workers at hazardous waste sites.

I have elected to refuse to take this exam. I understand that my refusal to take the exam at this time may result in failure to discover potentially preventable health problems and recognize that TtEC is not obligated to provide any further examination.

I have worked at the following sites during my employment with TtEC:

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Employee Name (print)

Employee Signature

Date

Witness Name (print)

Witness Signature

Date

EHS 4-5 ATTACHMENT B



TETRA TECH EC, INC.

EMPLOYEE RELEASE OF MEDICAL RECORDS

TO: Director, Health and Safety Programs

Please provide copies of medical records being maintained by Tetra Tech EC, Inc. for:

Employee Name:

Social Security Number:

Address:

Telephone Number:

Project(s) Worked On:

Dates of Employment:

Copies of these records should be sent to: (*Note: Tetra Tech EC prefers to release this information to the employee's personal physician*)

Employee

Personal Physician

Authorized Representative

Name:

Address:

Telephone Number:

Employee Signature

Date

EHS 4-6 : Temperature Extremes

**Last Revision By: Kennedy Lugo on
01/28/2011**

Created By: Lisa Kaminski on 01/24/2011

Purpose:	The purpose of this procedure is to prevent heat and cold stress related injuries and illnesses at field operations.		
Version Date:	01/28/2011 - Revised	Original Issue Date:	02/01/95
Category:	Company Procedures	Sections:	ESQ - Environmental Health & Safety Programs
Sub Category:	Departmental/Discipline	Document Type:	Procedure
Keyword Index:	EHS Compliance/Waste Management, Monitoring, Operational Control, Training	Document Owner:	Grey Coppi
Approved By:			

▼ **Table of Contents**

See Below

▼
1.0 PURPOSE

The purpose of this procedure is to prevent heat and cold stress related injuries and illnesses at field operations.

▼
2.0 SCOPE

This procedure applies to all Tetra Tech EC, Inc. ("the Company") and subcontractor field personnel that may be exposed to heat or cold stress during the performance of their field work assignments.

▼
3.0 MINIMUM REQUIREMENTS

3.1 Responsibilities

3.1.1 Line Management

General responsibilities are found in EHS 1-1, Responsibilities for Program Implementation. Procedure specific responsibilities are:
Site Supervisors have the responsibility to:

- a. Evaluate the work activities and anticipated temperatures that may affect worker productivity or harm workers.
- b. Provide resources and facilities necessary to prevent health effects from temperature extremes.
- c. Enforce work rules related to such prevention.

3.1.2 Environmental, Health and Safety Personnel

The Project Environmental and Safety Manager (PESM) will make the initial determination of heat and cold stress prevention requirements as part of the site EHS Plan (see EHS 3-2, EHS Plans) and oversee the implementation of this program on a project basis for all Company field

programs.

The Environmental Safety Supervisor (ESS) will assist with implementation of heat and cold stress prevention programs. The ESS will, in most cases, be the person responsible for monitoring heat and cold stress on the job, determining work/rest and work/warm-up schedules where used, and will implement emergency response or corrective action, if needed. The ESS will train site personnel on the effects of temperature extremes and the site prevention program, and will maintain records related to this program.

The ESS will implement the appropriate heat stress or cold stress requirements when temperatures indicate a potential heat or cold stress condition. The ESS will work with the line management to implement work rest regimens or other administrative controls such as ceasing certain activities, changing PPE, or engineering controls such as warming areas, cooling areas or shifting work schedules.

3.2 General Program Requirements

Adverse temperature conditions must be considered when planning site operations. Heat and cold stress injuries are completely avoidable with the proper education and work monitoring.

Implementing organizations will determine if contractual or regulatory requirements apply. Numerous Federal Agencies (e.g. USCOE, DOE) will contractually impose requirements related to temperature extremes. Also several states have passed regulations with requirements that will be applicable when working in those areas. In these cases, the information in the Guidance section and the attachments may become requirements.

4.0 GUIDANCE

This section contains optional guidance information to successfully execute the procedure.

4.1 Definitions

4.1.1 Body Core Temperature

The temperature of the organs within the trunk of the body.

4.1.2 Deep Frostbite

The tissue beneath the skin is solid to the touch; it may involve a full thickness freeze to the bone. This is an extreme emergency and can result in permanent tissue loss.

4.1.3 Frostbite

Freezing of body tissue.

4.1.4 Frostnip or Incipient Frostbite

A cold related injury that progresses slowly and is painless while developing. The victim is usually unaware that he/she has frost nip. The skin first becomes reddened, then changes to white; no freezing of tissue occurs.

4.1.5 Heat Cramp

Painful muscle spasms usually occurring on the arms, legs, and abdomen; caused by excessive loss of body electrolytes from profuse sweating.

4.1.6 Heat Exhaustion/Fatigue

Heat Exhaustion is a form of shock that occurs when the body loses large amounts of water

and electrolytes from excessive perspiration after exposure to heat and physical activity; also called heat prostration. Symptoms include profuse sweating, pale, cool, sweaty skin and other symptoms identified in Attachment 1, Section 1.3.

Heat fatigue refers to the temporary state of discomfort and mental or psychological strain arising from prolonged heat exposure. Workers unaccustomed to the heat are particularly susceptible and can suffer, to varying degrees, a decline in task performance, coordination, alertness, and vigilance.

4.1.7 Heat Rash

Profuse tiny raised red vesicles (blister-like) on affected areas of the skin which cause a prickling sensation during heat exposure.

4.1.8 Heat Stroke

A life-threatening condition caused by rapidly rising body core temperature that occurs when the body's temperature regulating mechanisms are overwhelmed. Sweating stops and the skin is dry and hot.

4.1.9 Hyperthermia

A rise in body core temperature above 99.6° F.

4.1.10 Hypothermia

Decreased body core temperature from prolonged exposure to freezing or near-freezing temperatures. This is the most life-threatening cold injury and affects the entire body with possible localized severe cooling. Hypothermia is defined as the deep body temperature dropping below 96.8°F (36°C).

4.1.11 Superficial Frostbite

Frostbite which affects the skin and tissue just beneath the skin. The skin is firm and waxy, tissue beneath is soft and numb. The skin turns purple and may tingle and burn during warming.

4.1.12 Wet-Bulb Globe Temperature (WBGT) Index

Method used to measure the environmental factors (e.g., temperature, relative humidity) which impact the body's physiological responses to heat.

4.1.13 Wind-Chill Factor or Equivalent Chill Temperature (ECT)

An index describing the effect of the cooling power of moving air on exposed flesh. The effect of wind velocity at a certain temperature is expressed as the equivalent cooling effect of a lower temperature with still air.

4.1.14 Work/Recovery Regimen

The ratio of time spent working to time spent resting in an area designed to relieve heat related conditions. This ratio is expressed in one hour periods. Example: A work/recovery regimen of 75% work, 25% rest corresponds to 45 minutes work, 15 minutes rest each hour.

4.2 General Program Guidance

Excessively hot or cold working environments can produce a number of different injuries. Critical to the ability to care for those injuries is a basic understanding of the way in which the body maintains its temperature and how it physiologically adjusts to extremes of heat and cold.

Preventing Heat and Cold Stress is prevented by planning in advance, and by training affected personnel in the symptoms of temperature extremes. OSHA has not established a temperature

extremes standard, instead relying on the general duty clause.

The US Army Corps of Engineers has established requirements for work under its control in "EM-385-1-1, [most current edition and ACGIH TLV/BEI Guide, most current edition.](#)"

The ACGIH Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices has updated its recommendations "[in the ACGIH TLV/BEI Guide, most current edition.](#)" These recommendations are incorporated in the appropriate sections.

Several states have also passed regulations or temperature extremes (e.g. Washington, California).

Three attachments are attached to provide information related to temperature extremes:

- Attachment 1 provides information on the body's physiological responses to heat and cold stress.
- Attachment 2 provides information on Heat Stress Monitoring and Work/Rest Regimens.
- Attachment 3 provides information on Cold Stress Monitoring and Work Recovery Regimens.

Proper care of victims who are suffering from the effects of heat or cold exposure will help to minimize injuries and speed recovery. On the other hand, improper treatment of these emergencies can result in serious injury, disability, or death.

The most effective first aid for any injury is prevention. When acceptable monitoring and prevention programs are followed, there should be no victims.

4.3 Heat Stress

A heat stress prevention program will be implemented when ambient temperatures exceed 70°F (21° C) for personnel wearing **permeable** clothing. Wet Bulb Globe Temperature Index (WBGT) or physiological monitoring will be conducted. When a WBGT Index is not available, or workers are wearing impermeable clothing, or the WBGT is not representative to the actual work area (enclosed work areas, work over asphalt or reflective materials etc.) **physiological** (pulse, temperature) **monitoring** may be used in its place.

WBGT devices located away from the project (up to several miles) maybe used for monitoring the project if the general weather and measured work surfaces are similar.

4.3.1 Selection of Chemical Protective Clothing

The PESM will review site data and working conditions and select the personal protective equipment ensemble that best protects the employees from site hazards. The risk of heat related illness will be fully considered in balancing the risks and benefits of the PPE.

4.3.2 Hydration

The Company will supply cool potable water or other suitable drinks (e.g., sport electrolyte replacements) for fluid replacement. Employees involved in the heat stress prevention program will be trained and encouraged to drink at a rate of approximately 8 oz. every 20 minutes. Individual disposable cups will be used and kept in closed containers or dispensers. Alternately, cool bottled water or sports drinks in individual sealed bottles may be provided.

4.3.3 Cool Rest Areas

Shaded rest areas will be provided. On large remediation projects, air conditioned rest areas should be provided for workers exposed to heat stress conditions. In low humidity locations, evaporative coolers or misting devices and fans can be used to provide cool down locations. On smaller projects, personnel can use air-conditioned vehicles as cool down areas.

4.3.4 Other Prevention Elements

The PESM, ESS and the Project Manager will incorporate other elements into the heat stress prevention program as necessary. The selected elements will be described in the EHS plans. Engineering controls are preferred. Where their use is not feasible, the program must incorporate administrative/work practice controls, personal protective equipment, or a combination. Examples of prevention program elements include:

- a. Engineering Controls
 - Air conditioned cabs for heavy equipment and vehicles (such controls may eliminate the need for other program elements).
 - Fans, blowers, or misters
 - Cool water for drenching personnel in impermeable clothing. This can be provided through a garden hose, a garden sprayer filled with ice water, a clean

drum full of water for "hard hat dipping" for containers of ice water and clean towels in the rest area to hasten cool down.

- b. Administrative and Work Practice Controls
 - Adjusting work schedules to do the bulk of the work during the cooler parts of the day.
 - Acclimating workers.
 - Implementing work/rest regimens (See Attachment 2 for Work/Rest Regimen Procedures)
- c. Personal Protective Equipment
 - Ice Vests
 - Circulating water vests
 - Vortex tubes and air circulating vests

Where ice vests and circulating water vests are used, rest periods of approximately 15 minutes should be taken when ice packs or batteries need to be changed. Continuous work over long periods of time with these devices may present an increased musculoskeletal injury risk due to the extra weight. Since the duration of the cooling effectiveness of these devices will vary with heat and work loads, users must be instructed to leave the area to replenish ice or batteries at the first sign of loss of cooling.

d. Monitoring

A program of environmental and physiological monitoring must be established in order to use work/rest regimens to verify the effectiveness of the regimens. The monitoring procedures are described in Attachment 2.

4.3.5 Training

All site personnel must receive training on the following topics:

- a. Health effects of hot environments and symptoms of heat related illness.
- b. Personal risk factors; including use of some medications (e.g. blood pressure, allergy, renal or sweat gland functions), physical condition, insufficient sleep; attempting full work loads when not fully acclimatized and dehydration due to consumption of alcohol, consumption of caffeine or other diuretics.
- c. Effect of personal protective equipment on heat stress conditions.
- d. Preventive measures
 - Physiological monitoring methods and thresholds
 - Acclimatization
- e. Fluid replacement; including taking frequent breaks for fluid replacement on an as-needed basis, maintaining hydration and electrolyte balances.
- f. Elements of the site Heat Stress Prevention Program.
- g. First aid and emergency response

Records shall be maintained in accordance with EHS 1-9, Recordkeeping.

4.4 Cold Stress

At certain times of the year, workers may be exposed to the hazards of working in cold environments. Potential hazards in cold environments include frostbite, trenchfoot or immersion foot, and hypothermia as well as slippery surfaces, brittle equipment, poor judgment and taking short cuts. ACGIH guidelines are provided in Attachment 3. The Company will implement the following cold stress prevention program elements when there is a potential for cold related injuries. Workers should be protected from exposure to cold so the core body temperature does not fall below the Threshold Limit Value of 96.8°F (36°C).

4.4.1 Personnel Protective Equipment

The following personal protective equipment will be provided as necessary to Company employees when conditions indicate a potential for cold-related injury. Subcontractors will be expected to supply appropriate equipment to their employees.

- a. Hard hat liners, face covers

- b. Gloves or glove liners, chemical sock and glove warmers
- c. Rain gear or water impermeable coveralls and gloves for potentially wet operations
- d. Fleeced boot liners where rubber steel-toe boots are used
- e. Winter coveralls

4.4.2 Engineering Controls

A variety of engineering controls shall be evaluated to minimize cold stress. These include:

- a. General or spot heating should be used to increase temperature at the workplace.
- b. If fine work is to be performed with bare hands in a cold environment, special provisions should be made to keep the workers' hands warm. Warm air jets, radiant heaters, or contact warm plates can be used.
- c. The work area should be shielded from winds and drafts that may affect the wind chill factor.
- d. The air velocity in refrigerated rooms should be minimized as much as possible, and should not exceed 2.2 mile/hour (1 m/sec) in the work zone.
- e. At temperatures below freezing, metal handles of tools and control bars should be covered with thermal insulating material.
- f. Unprotected metal chair sets should not be used as they conduct heat away from the body.
- g. When necessary, equipment and processes should be substituted, isolated, relocated, or redesigned to reduce cold stress at the worksite.
- h. Power tools, hoists, cranes, or lifting aids should be used to reduce metabolic workload.
- i. Heated warming shelters such as tents and cabins should be made available if work is performed continuously in an equivalent chill temperature of 20°F or below.
- j. The ESS may implement a work-rest schedule to reduce exposure to cold stress.
- k. Scheduled rest breaks should be enforced.
- l. Personnel exposed to the cold should be provided the opportunity for frequent intake of warm, sweet, caffeine-free, nonalcoholic liquids or soup.
- m. Work should be moved to warmer areas whenever possible.
- n. Extra workers should be assigned to highly demanding tasks.
- o. Workers should be allowed to pace themselves, taking breaks when needed.
- p. Workers shall be trained in the prevention, symptoms, and emergency response to cold stress.
- q. Utilize the "buddy system" to monitor cold stress symptoms among the workers.
- r. Allow new employees time to adjust or "acclimate" to cold conditions.
- s. Minimize the need to sit or stand in one place for long periods of time.
- t. Minimize the amount of work time spent in a cold environment.

u. Allow for the weight and bulkiness of protective clothing when estimating work performance goals and tasks.

4.4.3 Warm Rest Areas

The Company will make warm rest areas, e.g., heated trailers, available for rest breaks in cold weather. Employees will be permitted and encouraged to use the heated trailers whenever they experience symptoms of cold stress.

4.4.4 Work/Warm-Up Schedules

The work/warm-up schedule found in the ACGIH for cold stress will be followed as a guideline unless a government project, where they are required by ACOE or DOE regulation (Attachment 3). In addition, the Company will make warm-up periods available to employees who need to change into dry clothing to prevent immersion foot or hypothermia.

4.4.5 Training

All Company employees and subcontractors will be trained in:

- a. The effects of cold stress, including frostbite, immersion foot and hypothermia.
- b. Conditions that can lead to hypothermia, including work practices, clothing, activity levels, wind chill.
- c. Personal risk factors, including use of some medications, physical condition, insufficient sleep, dehydration due to consumption of caffeine, alcohol or other diuretics.
- d. Recognition of the symptoms.
- e. Methods employees can use to protect themselves.
- f. First aid procedures and recognition of medical emergencies.

Records shall be maintained in accordance with EHS 1-9, Recordkeeping.



5.0 REFERENCES

Please Describe Your Reference Here	Place Your Link in this Column
1. ACGIH (American Conference of Government Industrial Hygienists) Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, 2007	
2. Fundamentals of Industrial Hygiene. Third Edition, 1988	
3. National Safety Council	
4. NIOSH (National Institute for Occupational Safety and Health)	
5. NIOSH/OSHA/EPA/USCG/EPA	
6. Occupational Exposure to Hot Environments, Revised Criteria 1986	
7. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities - October 1985	
8. EHS 1-1, Responsibilities for Program Implementation	
8. EHS 1-9, Recordkeeping	

9. EHS 3-2, Environmental, Health & Safety Plan(s)	
10. US Army Corps of Engineers, Safety & Health Manual (EM 385-1-1) Nov 2003, Section 06.J.04	



6.0 ATTACHMENTS

Please Provide a Description of the Attachment	Place Your Attachments Here
1. Heat and Cold Stress Information	 EHS 4-6, Attachment 1 final 11-8-08.doc
2. Heat Stress Monitoring and Work/Rest Regimens	 EHS 4-6, Attachment 2 Final 11-11-08.doc
3. Cold Stress Monitoring and Work/Recovery Regimens	 EHS 4-6, Attachment 3 final 11-8-08.doc
4. Example - WBGT Monitoring Form	 Attachment 4 Example WBGT Monitoring Form 11-11-08.doc
5.	

Tetra Tech EC, Inc.

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ATTACHMENT 1

HEAT AND COLD STRESS INFORMATION

1.0 HEAT STRESS

Hot weather can cause physical discomfort, loss of efficiency, and personal injury. The human body strives to maintain a constant core temperature of 98.6° F (37° C). If this temperature is to be maintained, heat loss must equal heat production. This balance is maintained by variations in the blood flow to the outer part of the body. When the core temperature rises, blood vessels beneath the skin dilate, and the blood brings increased heat to the skin, where it is dissipated by radiation and convection. This works only as long as the skin temperature is higher than the temperature of the outside environment. Heat loss by radiation convection is impossible when the temperature of the outside air approaches or exceeds the temperature of the skin. The body will now rely on dissipation through evaporation of sweat. But the sweat mechanism also has limits. The normal adult can sweat only about one liter per hour and can sweat at that rate for only a few hours at a time. In addition, sweating is effective only if the relative air humidity is low. Sweat evaporation ceases entirely when the relative humidity reaches 75 percent.

Of particular concern in heat stress monitoring is the use of personal protective clothing which decreases natural body ventilation and greatly increases the temperature and humidity to the skin. If precautions are not taken, heat stress will progress into a heat-related injury. Heat-related injuries fall into three major categories: heat cramps/fatigue, heat exhaustion, and heat stroke.

1.1 Heat Cramps

Heat cramps are the least common and least severe of heat injuries. Heat cramps are thought to occur when the electrolytic balance in the blood between water, calcium, and sodium (salt) is altered. Low blood salt level, from profuse sweating and inadequate salt consumption, is the usual cause, as well as poor conditioning..

1.1.1 Symptoms

- a. Severe muscle cramps and pain, especially of the upper legs, calves, and abdomen, and occasionally in the arms
- b. Faintness and dizziness
- c. Possible nausea and vomiting

1.1.2 Treatment

Emergency care will include:

- a. Remove victim from the hot environment and allow victim to rest and cool down
- b. Provide small amounts of cool water or use a commercial sport drink and allow victim to sip this solution to hydrate. Avoid drinks with caffeine or alcohol.

- c. To relieve pain, gently stretch the involved muscle group; gently message cramps as long as it does not increase the pain or discomfort.

The victim should avoid exertion of any kind for 12 hours. A victim of heat cramps is prone to recurrence.

1.2 Heat Fatigue

Heat Fatigue is most likely to affect new or un-acclimatized workers.

1.2.1 Symptoms

- a. Loss of energy, extreme tiredness
- b. Stumbling, staggering, or loss of balance. The loss of balance is a particular risk to workers on elevated surfaces or climbing.
- c. Excessive skin redness as body moves blood to surface
- d. Lack of judgment recognizing the onset of heat fatigue and taking action to remove themselves from the environment for cool down and hydration

1.2.2 Treatment

- a. Remove from the hot work environment for cool down
- b. Provide fluids (cool water or sport drinks to re-hydrate the victim)
- c. Extend cool-down period or cessation of work for the day with extra hydration and rest
- d. Enhance observations by other workers and physiological monitoring
- e. Provide individual work/rest regimens until acclimatized

1.3 Heat Exhaustion

1.3.1 Symptoms

Heat exhaustion is the most common heat injury and usually occurs in an individual who is involved with heavy physical exertion in a hot, humid environment, and is wearing protective clothing. Heat exhaustion is a mild state of physical shock caused by the pooling of blood in the vessels just below the skin, causing blood to flow away from the major organs of the body. Due to prolonged and profuse sweating, the body also loses large amounts of salt and water.

The symptoms of heat exhaustion include:

- a. Profuse sweating
- b. Pale, cool, sweaty skin
- c. Headache and extreme weakness, fatigue
- d. Nausea and possible vomiting

- e. Dizziness and faintness
- f. Collapse and possible brief unconsciousness
- g. Body core temperature from 100.4° F (38° C) to 104° F (40° C), although skin temperature may even be slightly below normal.

1.3.2 Treatment

Emergency care will include:

- a. Remove victim from the hot environment and out of the exclusion zone
- b. Lie victim down with feet slightly raised
- c. Remove as much clothing as reasonable (especially personal protective clothing); loosen what cannot be removed
- d. Apply cold, wet compresses to the skin; fanning will also aid in cooling
- e. If the victim is fully alert, allow him/her to drink water at the same rate, that was used for the emergency care of heat cramps
- f. If the victim vomits, do not give fluids by mouth, transport him/her to a hospital immediately (dehydration is the most critical problem in heat exhaustion victim; intravenous fluids will have to be given)
- g. Take temperature every 10 minutes, if the victim's temperature is above 101° F (38.3 C) or shows a steady increase, transport to a hospital immediately and start sponging him/her off with cool water

1.4 Heat Stroke

Heat stroke is a true life-threatening emergency having a mortality rate of 20 to 70 percent. This condition results when the heat regulating mechanisms of the body break down and fail to cool the body sufficiently. The body temperature rises to between 104° F and 110° F (40.6 – 43.3° C); no sweating occurs in about 50 percent of the victims. Because no cooling takes place, the body stores increasingly more heat, and eventually brain cells are damaged, causing permanent disability or death.

There are two basic kinds of heat stroke: classic heat stroke and exertional heat stroke. Classic heat stroke, in which people lose the ability to sweat, generally effects the elderly or chronically ill. Exertional heat stroke, in which victims retain the ability to sweat, is accompanied by physical exertion and muscle stress. Exertional heat stroke is the type that will be most commonly encountered on a field operation requiring strenuous physical activity.

1.4.1 Symptoms

- a. Oral temperature of 104° F (40° C) or higher
- b. Hot, reddish skin, skin is usually dry
- c. Headache

- d. Dry mouth
- e. Shortness of breath
- f. Nausea or vomiting
- g. Increasing dizziness and weakness
- h. Mental confusion and anxiety; victims may show unusual irritability, aggression, combative agitation, or hysterical behavior
- i. Convulsions, sudden collapse and possible unconsciousness; all heat stroke victims having varying levels of consciousness, ranging from disorientation to coma

1.4.2 Treatment

Emergency care will include:

- a. Remove the victim from the hot environment and from the exclusion zone
- b. Call for trained emergency medical personnel **immediately**
- c. Remove as much clothing as reasonable (especially personal protective clothing); cut clothing with bandage scissors, if necessary, being careful not to injure victim
- d. Pour cool water over the victim, avoiding his nose and mouth
- e. Fan the victim
- f. Place cold packs under the arms and against neck, groin and ankles
- g. Wrap victim in a wet blanket
- h. Continue a combination of these methods until the oral temperature falls below 103° F (39.4° C) (take measures to prevent chilling, if necessary, i.e., use slower cooling if the victim starts shivering)
- i. Elevate the head and shoulders slightly during cooling
- j. Never give the victim anything to drink unless fully conscious and vomiting is unlikely

Because heat stroke involves the entire body, a number of complications may result including brain swelling, convulsions, coma, kidney failure, liver failure, high blood pressure and heart failure.

Therefore, always transport the victim to a hospital even if the body core temperature has lowered to near normal.

1.5 Heat Stroke Verses Heat Exhaustion

The two most reliable and distinct differences between heat stroke and heat exhaustion are:

1.5.1 Heat Stroke

- a. Skin flushed (red); may be dry; hot to touch (note: Personnel who have been wearing impermeable clothing may have wet skin from earlier sweating that has ceased.)
- b. Oral temperature above 104°F (40° C)

1.5.2 Heat Exhaustion

- a. Skin pale; wet or clammy; cool to touch
- b. Oral temperature usually normal

2.0 COLD STRESS

Hypothermia is a drop in the core body temperature below 96.8° F (36° C). The first symptoms of hypothermia are uncontrollable shivering and the sensation of cold at about 95° F (35° C); this is followed by a slowed and sometimes irregular heart beat, a weakened pulse and a drop in blood pressure. Vague or slow slurred speech, memory lapses, apathy, incoherence and drowsiness can occur. Other symptoms may include cool skin, slow, irregular breathing, apparent exhaustion, and fatigue after rest.

2.1 Prevention

Hypothermia is caused by prolonged exposure to a cold environment, whether air, water, or snow and ice. Adequate dry clothing with appropriate insulating capacity must be provided to workers to prevent hypothermia, especially if work is performed in air temperatures below 40° F (4.4° C). Wind chill is a critical factor. Work at a slow but steady pace. The job should be a "no sweat" operation.

Unless there are unusual or extenuating circumstances, cold injury to other than the extremities (hands, feet, and head) is not likely to occur without the development of the initial signs of hypothermia. Older workers or workers with circulatory problems require special precautionary protection against hypothermia. The use of extra insulating clothing and/or a reduction in the duration of the exposure period are special precautions that should be considered for these workers. The precautionary actions to be taken will depend upon the physical condition of the worker and should be determined with the advice of a physician with knowledge of the cold stress factors and the medical condition of the worker.

2.2 Treatment

First aid for mild hypothermia will be performed as follows:

- a. End the exposure - get the victim out of the cold and wet
- b. Replace wet clothing with dry or add insulation to clothing
- c. Offer warm, non-alcoholic fluids
- d. Increase exercise
- e. Seek shelter from wind, wet and cold

CAUTION: If the victim remains cold for a number of hours, chemical changes may have taken place which, on re-warming, may cause major medical problems for the victim and which could result in death. Severely hypothermic victims are best warmed in the hospital under controlled conditions. If a severely hypothermic victim cannot be transported to a hospital within a few hours, re-warming should begin in the field.

2.3 Frostbite

2.3.1 Prevention

Frostbite can be prevented by wearing sufficient protection to prevent skin from coming into prolonged contact with a freezing environment. The following steps can be taken.

- a. Wear sufficient clothing. Mittens are better than gloves. Face masks and wool stocking caps are better than hats. Wind and waterproof hoods protect the face and neck.
- b. Clothing should be loose enough to prevent constriction of blood vessels. Boots must be roomy enough to permit movement of the toes with no feeling of tightness.
- c. Do not contact conductive metals or contact gasoline or other solvents with bare skin as rapid evaporation of solvents may quickly lead to frozen tissues in a cold environment.
- d. Exercise the toes and fingers to maintain circulation.
- e. Observe the condition of your partners' face, hands and ears frequently for signs of frostbite.
- f. Avoid smoking and drinking alcoholic beverages.

2.3.2 Symptoms

Frostbite can occur either before or after the onset of hypothermia when body tissue (usually an extremity) is exposed to freezing temperatures. Frostbite occurs when the fluids surrounding tissue cells freezes. The danger of frostbite increases with increased wind chill and/or reduced temperatures below 32° F (0° C). Frostbite can also occur if tissues are in prolonged contact with a frozen material or object. Skin contact with frozen metal, for example, can result in frostbite in a short period of time, even in a warm environment.

There are three degrees of frostbite:

- a. First degree - freezing without blistering or peeling, "frostnip"
- b. Second degree - freezing with blistering and/or peeling, and
- c. Third degree - freezing resulting in the death of skin tissue and possibly the death of underlying tissues as well

Symptoms of frostbite include the following:

- a. The skin changes color to white or grayish-yellow, progresses to reddish-violet, and finally turns black as the tissue dies
- b. Pain may be felt at first, but subsides

- c. Blisters may appear, and
- d. The affected area is cold and numb

2.3.3 Treatment

First aid for superficial (first degree) frostbite is as follows:

- a. Place a warm body part next to the frozen area, applying firm, steady pressure.
- b. DO NOT RUB THE AREA. Rubbing may cause further damage to already injured skin.
- c. Protect the area from further freezing.

First aid for deep frostbite (second and third degree) is as follows:

- a. KEEP THE FROZEN PART FROZEN!
- b. Prevent further injury: avoid rubbing and further freezing of unaffected tissue.
- c. If the part has thawed, the part should NOT be allowed to refreeze or bear weight. A victim with thawed feet should be carried out.
- d. Give the victim plenty of fluids and evacuate to medical assistance as soon as possible.

2.4 Trench Foot

2.4.1 Symptoms

This condition may be caused by long, continuous exposure to cold without freezing, combined with persistent dampness or actual immersion in water. Edema (swelling), tingling, itching, and severe pain occur, and may be followed by blistering, death of skin tissue, and ulceration. When other areas of the body are affected besides the feet, the condition is known as chilblains.

2.4.2 Prevention

Trench foot and chilblains can be prevented by keeping the body as dry as possible at all times. Waterproof boots should be worn when required, but provisions must be made for preventing excessive perspiration to accumulate inside the boots. Socks should be changed at least twice daily and the boots wiped dry inside with each change of socks. The feet should also be wiped dry and foot powder applied.

2.4.3 Treatment

Affected body parts should not be rubbed or massaged, but bathed in water using plain white soap. Dry thoroughly and elevate the body part, allowing the body part to be exposed at room temperatures. If the feet are affected, do not walk during treatment.

(Internal Note – this attachment is a total revision and no revision bars are shown)
ATTACHMENT 2

HEAT STRESS MONITORING AND WORK/REST REGIMENS

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1.0 INTRODUCTION

Establishing a work/rest regimen that allows work to be completed in a timely manner while providing adequate rest time to prevent heat stress requires involvement of the ESS, Project Supervisors, and individuals involved. In many cases, particularly when wearing normal field type clothing (i.e., level D), awareness and communication are the key elements to a successful program. Allowing and encouraging rest periods on an "as needed" basis while ensuring vigilance for initial symptoms of heat stress, encourages this success.

There are times when this approach is not appropriate. When heat stress contributing protective clothing (e.g., respirators, impermeable coveralls) are worn for extended periods, or when "as needed" work/rest regimens adversely impact either the individuals exposed to the heat source or work completion, a more formal work/rest regimen will be established.

Formal work/rest regimens are based on when Action Levels and TLV limits are approached and: 1) monitoring ambient conditions (e.g., with a Wet Bulb Globe Temperature Index (WBGT), estimating work loads and establishing work/rest times, 2) monitoring physiological conditions and adjusting work/rest periods, 3) applying Job Specific Controls.

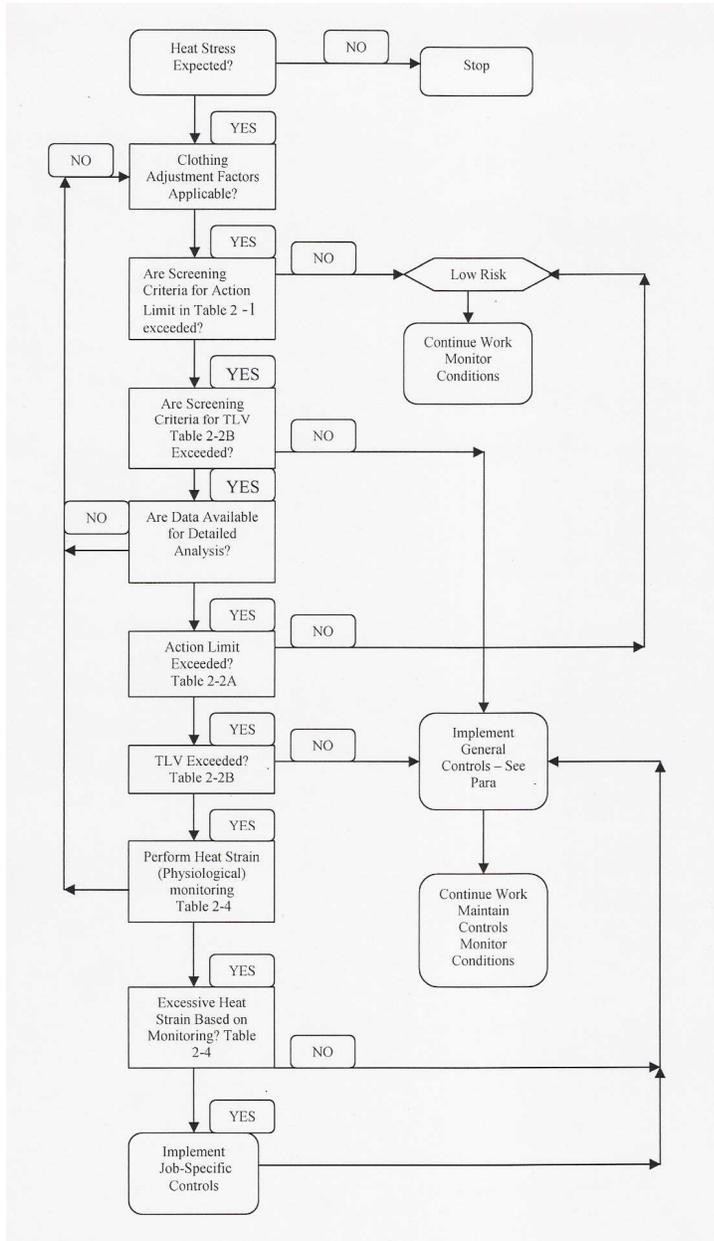
The WBGT, physiological monitors, and personnel heat stress monitors will be used in accordance with manufacturer's instructions. Personnel heat stress monitors will be approved for use by the PESM.

This attachment includes guidance for monitoring and preventing heat stress and heat strain in accordance with the 2007 ACGIH. The 2007 ACGIH Guidelines were revised to include an Action Level and a Threshold Limit Value based on WBGT measurements). The goal is to maintain body core temperatures within +/- 1.8° F of 98.6° F (+/-1° C. of 37° C) The TLV represents conditions under which it is believed that nearly all acclimatized, adequately hydrated, unmedicated, healthy workers may be repeatedly exposed without adverse health effects. The Action Limit is similarly protective of unacclimatized workers and represents conditions for which a heat stress management program should be considered.

This guidance is not a fine line between safe and dangerous. Therefore professional judgment is of particular importance in assessing the level of heat stress and physiological heat strain to provide for protecting nearly all healthy workers with due consideration of individual types and type of work.

The decision process shown in Figure 1-1 should be started if 1) a qualitative exposure assessment indicates the possibility of heat stress, 2) there are reports of discomfort due to heat stress, or 3) professional judgment indicates heat stress conditions.

Figure 1-1 – Evaluating Heat Stress and Strain



Note: At the option and judgement of the ESS, physiological monitoring may be commenced at any time, supplementing or replacing WBGT monitoring.

2.0 WBGT-BASED WORK/RECOVERY REGIMENS

2.1 Work/Recovery Regimens

When required, the WBGT Index will be used in conjunction with the work load, protective clothing, and other factors to determine the appropriate work/recovery regimen and need for physiological monitoring for personnel.

The ESS will monitor the temperature, work loads, and protective clothing. The WBGT will be adjusted based on the clothing adjustment factors. The Work Loads and the WBGT will then be used to determine the Work and recovery cycles for the workers involved.

The work/recovery regimen using the WBGT procedure will be used as a guideline, as the WBGT is only an index of the environment. Table 2-1 identifies the Clothing Adjustment factors.

Table 2-1 Clothing-Adjustment Factors for Some Clothing Ensembles

Clothing Type	Addition to WBGT Index
Work Clothes (Long Sleeve Shirt and Pants)	0° F (0° C)
Cotton (woven material) Coveralls	0° F (0° C)
Double Layer woven Clothing	5.4° F (3° C)
SMS Polypropylene Coveralls	1.0° F (.5° C)
Polyolefin Coveralls	1.8° F (1° C)
Limited-Use Vapor Barrier coveralls	19.8° F (11° C)

Notes on Table 2-1:

For example, WBGT Index is 86° F. If double layer woven overalls (5.4° F) are used with acclimatized workers the Corrected Index Temperature is 91.9° F.

These values must not be used for completely encapsulating suits, often called Level A. Clothing Adjustment factors cannot be added for multiple layers. **The coveralls assume that only modesty clothing is worn underneath, not a second layer of clothing.**

These values may also apply to other protective clothing, such as rain suits, when worn where the body is fully covered and the worker does not have the option of opening or venting the clothing while working (e.g. individuals in a radiological zone or other hazardous areas).

Tables 2-2-A and 2-2-B outline the work/recovery regimens based upon WBGT temperature and workload.

Table 2-2A Permissible Heat Exposure Action Limit Values

(Values are given in °F and (°C) WBGT Index)*

Allocation of Work in a Cycle of Work and Recovery	Work Load Category			
	Light	Moderate	Heavy	Very Heavy
75% to 100%	82.4 (28.0)	77.0 (25.0)		--
50% to 75%	83.3 (28.5)	78.8 (26.0)	75.2 (24.0)	--
25% to 50%	85.1 (29.5)	80.6 (27.0)	77.9 (25.5)	76.1 (24.5)
0% to 25%	86.0 (30.0)	84.2 (29.0)	82.4 (28)	80.6 (27)

Table 2-2B Permissible Heat Exposure Threshold Limit Values)
(Values are given in °F and (°C) WBGT)*

Allocation of Work in a Cycle of Work and Recovery	Work Load Category			
	Light	Moderate	Heavy	Very Heavy
75% to 100%	87.8 (31.0)	82.4 (28.0)	---	--
50% to 75%	87.8 (31.0)	84.2 (29.0)	81.5 (27.5)	--
25% to 50%	89.6 (32.0)	86.0 (30.0)	84.2 (29.0)	82.4 (28.0)
0% to 25%	90.5 (32.5)	88.7 (31.5)	86.9 (30.5)	86.0 (30.0)

Notes on Table 2-2-A & 2-2-B:

- a. The values in Table 2-2A & 2-2B are for fully acclimatized workers wearing light weight pants and long sleeved shirts. For conditions other than this, use this table with the Clothing Adjustment factors from Table 2-1. For unacclimatized workers, the Action Limit Values should be used as TLVs.
- b. These values assume that workers drink frequently and have properly increased salting of food prior to exposure.
- c. These values are guidelines. Actual levels may be modified based on individual physiological response and actual work and rest conditions.
- d. These values assume that the rest location is cool enough to alleviate heat load conditions.
- e. See Table 2-2C for Work Load Categories.
- f. Values in the table are applied by reference to the "Work-Rest Regimen" section and assume 8-hour workdays in a 5-day workweek with conventional break.
- g. Because of the physiological strain associated with Heavy and Very Heavy work among less fit workers, regardless of the WBGT Index, criteria values are not provided for continuous work and for up to 25% rest in an hour for Very Heavy work. The screening criteria are not recommended, and a detailed analysis and/or physiological monitoring should be used.
- h. WBGT Index values are expressed to the nearest .5°C and .1°F

Table 2-2C provides examples of work activity categories for use in table 2-2A and 2-2B. Recovery rest areas should be near the work areas, shaded, and with adequate supplies of cool water. Aids to assist in evaporative cooling such as fans or blowers should be considered.

Table 2-2C Work Load Categories

Categories	Example Activities
Resting	Sitting quietly
Light	Sitting with light manual work with and or hands and arms, and driving. Standing with some light arm work and occasional walking.

Moderate	Sustained moderate hand and arm work, moderate arm and leg work, moderate arm and trunk work, or light pushing and pulling. Normal walking.
Heavy	Intense arm and trunk work, carrying, shoveling, manual sawing, pushing and pulling heavy loads; walking at a fast rate.
Very Heavy	Very intense activity at fast to maximum pace,

2.2 Acclimatization

Acclimatization is a gradual physiological adaptation that improves an individual's ability to tolerate heat stress. Full heat acclimatization requires physical activity under heat-stress conditions similar to those anticipated for the work. With a recent history of heat-stress exposures of at least 2 continuous hours (e.g. 5 of the last 7 days to 10 of 14 days) a worker can be considered acclimatized for the purposes of the TLV shown in table 2-2B.. Its loss begins when the activity under those heat-stress conditions is discontinued, and a noticeable loss occurs after 4 days and may be completely lost in 3 to 4 weeks. Because acclimatization is to the level of the heat stress exposure, a person will not fully acclimatize to a sudden higher level, such as during a heat wave.

Numerous factors can affect acclimatization and a worker's ability to work in heat, including age and off-work activities (amount of sleep, consumption of alcoholic beverages, prescription and nonprescription medications (e.g. antihistamines and other medications that decrease the body's ability to carry water or reduce sweating).

2.3 WBGT Determination

WBGT device should be operated in accordance with the manufacturer's instructions. The location of the WBGT device should be evaluated based on the work. Work inside buildings (no wind), within depressions or excavations, over asphalt or black liners (such as HPDE) would dictate that the device should be located near the area to account for the difference in the globe temperature due to radiance and reflection. Work on open soil/gravel will have a lesser affect on the readings and will allow the readings to be indicative of a large area (up to several miles). (Note WBGT Index readings for the area can frequently be obtained on a real-time basis from weather stations, or from the internet).

3.0 HEAT STRAIN GENERAL WORK CONTROLS

General controls for Heat Strain prevention and control include:

- Provide accurate verbal and written instructions, annual training programs and other information about heat stress and strain.
- Encourage drinking small volumes (approximately 1 cup) of cool, palatable water (or other acceptable fluid replacement drink, (e.g. sport drink) about every 20 minutes.
- Permit self-limitation of exposures and encourage co-worker observation to detect signs and symptoms of heat strain in others.
- Counsel and monitor those who take medications that may compromise normal cardiovascular, blood pressure, body temperature regulation, renal or sweat gland functions and those who abuse or are recovering from the abuse of alcohol or other intoxicants.
- Encourage healthy life-styles, idea body weight and electrolyte balance

- Adjust expectations of those returning to work after absence from hot exposure situations and encourage consumption of salty foods (with approval of physician if on a salt-restricted diet).
- Consider preplacement medical screening to identify those susceptible to systemic heat injury.
- Monitor the heat stress conditions and reports of heat related disorders.

4.0 JOB SPECIFIC CONTROLS FOR HEAT STRAIN STRESS

When excessive heat strain is observed or predicted based on monitoring, the some or all of the following Job Specific Controls should be considered:

- Engineering controls that reduce the metabolic rate, provide general air movement, reduce process heat and water vapor release, and shield radiant heat sources, among others.
- Administrative controls that set acceptable exposure times, allow sufficient recovery, and limit physiological strain.
- Personal protection that is demonstrated effective for the specific work practices and conditions at the location.

5.0 PHYSIOLOGICAL MONITORING

5.1 Monitoring Frequencies

Physiological monitoring will commence at the discretion of the ESS, or when WBGT Index monitoring is not used and the ambient temperatures exceed 70° F (21° C). Physiological monitoring may be used whenever work/recovery regimens are implemented to verify the effectiveness of the work/rest ratio including the cool down periods. Physiological monitoring should be used whenever workers have the potential to exceed the TWA or TLV, and must be used when personnel are working in impermeable clothing

Work in impermeable protective clothing should include consideration of a buddy rule (no lone workers), particularly at higher temperatures. The observers should be watching for sudden or severe fatigue, lightheadedness, loss of balance, loss of judgment or clumsiness that may indicate heat fatigue or heat stress.

The monitoring frequencies may be adjusted for individuals after experience with their work in heat stress environments has been gained provided the work involved, PPE, and other factors remain the same.

Attachment 4 is an Example forms that may be used for WBGT monitoring and individual physiological monitoring

5.2 Pulse Rate Monitoring

The level of stress may also be monitored by an individual's pulse rate. If either of the following occur, the individual should be removed from heat stress exposure:

- A sustained (several minutes) heart rate is in excess of 180 beats per minute (bpm) minus the individual's age in years (180-age), for individuals with normal cardiac performance. or
- A recovery heart rate greater than 120 bpm one minute after a peak work effort

The affected individual should be removed from the heat stress exposure and allowed to recover.

A recovery heart rate less than 110 bpm at indicates the individual can return to work but the work period should be adjusted. Shorten the next work period by one third while maintaining the same rest period. Increase the monitoring on the individual.

Pulse rates can be taken with an electronic pulse meter, or manually with a stopwatch for 30 seconds.

5.3 Body Core Temperature

Obtaining an accurate body core temperature for sustained work can be difficult, as the body will start to cool as soon as work is stopped or if protective clothing is removed and evaporation rates are increased. Monitor personnel as soon as possible to obtain an accurate temperature following the manufacturer's instructions for the particular instrument used. A body core temperature greater than 101.3° F (38.5° C) for medically selected and acclimatized personnel, or greater than 100.4° F (38° C) in unselected, unacclimatized workers may mark excessive heat strain and an individual's exposure to heat stress should be discontinued.

Average Body temperature varies between individuals and within individuals, typically fluctuating 1 degree F above or below the scientific "norm" of 98.6° F (37° C) oral temperature, depending on activity and general health.

Temperatures taken at the ear (tympanic temperature) has been developed. Current information indicates that an ear temperature reading will be 0.5 to 1.0° F (0.3 to 0.6° C) higher than an oral temperature reading, since the eardrum shares blood supply with the hypothalamus in the brain. An armpit (axillary) temperature is typically 0.5 to 1.0° F (0.3 to 0.6° C) lower than an oral temperature reading and may take up to 10 minutes to get an accurate reading.

Temporal or forehead thermometers use skin temperature to determine the body temperature. Due to the variations of the location and effects of evaporation, these are not as accurate as electronic and ear thermometers, however they offer other benefits of speed and accessibility when an individual may be fully suited.

Take the oral, ear or temporal temperature immediately at the start of the rest period. If the temperature exceeds 99.5° F (37.5° C) (oral or adjusted to oral) shorten the next work period by a third. Do not return the worker to hot work in semi-permeable or impermeable clothing until the body temperature is less than 99.5° F (37.5° C).

Body temperatures may be taken with disposable oral thermometers or infrared ear drum scanners. Temporal infrared thermometers are also available and may be considered to be less intrusive to the workers than oral or ear measurement devices.

(Note- Instruments coming in contact with skin or body fluids (sweat, saliva, etc) should either be used with disposable covers or sanitized between use.)

5.4 Removal from Exposure

If an individual requires a shortening of the work period on more than two consecutive monitoring periods, or repeatedly over a few days, they should be removed from exposure to hot environments, wearing semi-permeable, impermeable protective clothing until examined and cleared for such work by the consulting physician.

If a worker appears to be disoriented or confused, suffers inexplicable irritability, malaise, or chills, the worker should be removed for rest in a cool location with rapidly circulating air and kept under skilled observation. Absent medical advice

to the contrary, treat this as an emergency with immediate transport to a hospital. An emergency response plan is necessary.

The heat stroke victim is often manic, disorientated, confused, and delirious or unconscious. treat this as an emergency with immediate transport to a hospital. The victim's body core temperature is greater than 104° F (40° C). If signs of heat stroke appear, start aggressive cooling immediately. Emergency care and hospitalization are essential. An emergency response plan is necessary.

Prolonged increases in deep body temperature and chronic exposures to high level of heat stress are associated with other disorders, such as temporary infertility (male and female), elevated heart rate, sleep disturbance, fatigue and irritability. During the first trimester of pregnancy, a sustained core temperature greater than 102.2° F (39° C) may endanger the fetus.

ATTACHMENT 3

COLD STRESS MONITORING AND WORK/RECOVERY REGIMENS

1.0 INTRODUCTION

Cold Stress TLVs are intended to protect workers from the severest effects of cold stress (hypothermia) and cold injury and to describe exposures to cold working conditions under which it is believed that nearly all workers can be repeatedly exposed without adverse health effects. The TLV Objective is to prevent the deep body temperature from falling below 96.8° F (36° C) and to prevent cold injury to body extremities. For a single, occasional exposure to a cold environment, a drop in the core temperature to no lower than 95° F (35° C) should be permitted. In addition to provisions for total body protection, the TLV objective is to protect all parts of the body with emphasis on hands, feet, and head from cold injury.

This attachment includes guidance for monitoring and preventing cold stress in accordance with the 2007 ACGIH.

2.0 COLD STRESS EVALUATION AND CONTROL

Workers that will subject to working in cold environments should be familiarized with the symptoms and effects of cold work. This should include awareness of the effects of medication, use of alcohol on the worker, as well as recognizing the symptoms of frostnip, frostbite, and hypothermia.

The ESS with support by the PESM should evaluate the workplace conditions and implement the controls appropriate for the work being performed and the work environment.

2.1 Thresholds

For exposed skin, continuous exposure should not be permitted when the air speed and temperature results in an equivalent chill temperature of -25.6° F (-32° C). Superficial or deep local tissue freezing will occur only at temperatures below 30.2° F (-1° C) regardless of wind speed. Table 1 provides the Equivalent Chill Temperatures on exposed flesh.

At air temperatures of 35.6° F (2° C), or less, it is imperative that workers who have become immersed in water or whose clothing becomes wet be immediately provided a change of clothing and treated for hypothermia.

Special protection of the hands is required to maintain manual dexterity for the prevention of accidents, including:

- If fine work is to be performed with bare hands for more than 10-20 minutes in a temperature below 60.8° F (16° C), special provisions should be made for keeping workers hands warm, such as warm air jets, radiant heaters or contact warm plates. Metal handles of tools and control bars should be covered with thermal insulating materials below 30.2° F (-1° C).
- If the air temperature falls below 60.8° F (16° C) for sedentary, 39.2° F (4° C) for light, 19.4° F (-7° C) for moderate work, and fine manual dexterity is not required, then gloves should be used by workers.
- To prevent frostbite, the workers should wear anti-contact gloves.

- When cold surfaces below 19.4° F (-7° C) are probable, a warning to workers should be given to prevent inadvertent contact by bare skin.
- If air temperatures are 0° F (-17.5° C) or less, the hands should be protected by mittens. Machine controls and tools for use in cold conditions should be designed so they can be handled and used without removing the mittens.

Provisions for additional total body protection are required if work is performed in an environment at or below 39.2° F (4° C), including:

- Workers should wear cold protective clothing appropriate for the level of cold and physical activity.
- If the air velocity at the work site is increased by wind, draft, or artificial ventilating equipment, the cooling effect of the wind should be reduced by shielding the work area or by wearing an easily removable windbreak garment.
- If only light work is involved and the worker may become wet on the job site, the outer type of clothing in use may be of a type impermeable to water. With more severe work under such conditions, the outer layer should be water repellent and the outerwear changed as it becomes wetted. Outer garments should have provisions for easy ventilation in order to prevent wetting of inner layers by sweat. If a worker's clothes have become wet by sweat, the worker should change into dry clothes before entering the cold area. Workers should change socks and any removable liners or felt insoles at regular daily intervals, or use vapor barrier boots.
- If exposed area of the body cannot be protected sufficiently to prevent sensation of excessive cold or frostbite, protective items should be supplied in auxiliary heated versions.
- If the available clothing does not give adequate protection to prevent frostbite or hypothermia, work should be modified or suspended until adequate clothing is available or until weathers conditions improve.
- Workers handling evaporative liquids (gasoline, alcohol, etc) at air temperatures below 39.2° F (4° C) should take special precautions to avoid soaking of clothing or gloves with the liquids because of the added danger of cold injury due to evaporate cooling.

2.2 Work Warming Regimens

For work performed continuously in the cold at an equivalent chill temperature (ECT) or below 19.4° F (-7° C), heated warming shelters should be made available nearby with workers encouraged to use these shelters at regular intervals. The frequency of use should be dependent of the severity of the exposure. Table 2 provides a Work/Warm-up schedule for a four-hour schedule.

The onsite of shivering, minor frostbite, the feeling of excessive fatigue, drowsiness, or euphoria are indications for immediate return to the shelter. When entering the heated shelters, outer clothing should be removed and the remainder of clothing loosened or opened to permit sweat evaporation or a change of dry clothing provided.

Dehydration occurs insidiously in the cold environment and may increase the susceptibility of the worker to cold injury. Warm sweet drinks and soups should be provided at the work site to provide caloric intake and fluid volume. The intake of coffee or other diuretics should be limited.

For work practices at or below 10.4° F (-12° C) the following should be considered:

- Workers should be under constant protective observation (buddy system or supervision)
- The work rate should not be so high as to cause heavy sweating that will result in wet clothing. If heavy work must be performed, rest periods should be taken in heated shelters and the opportunity for changing into dry clothing provided.

- New employees should not be required to work fulltime in the cold during the first few days until they become accustomed to the working conditions and the required protective clothing.
- The weight and bulkiness of clothing should be factored into the estimates of required work performance and weights to be lifted by the worker.
- Work should be organized so that sitting still or standing still for long periods is minimized. Unprotected metal chairs should not be used. The worker should be protected from drafts to the greatest extent possible.
- Eye protection for workers employed out-of-doors in a snow or ice covered condition should be supplied. Special safety goggles to protect against ultraviolet light and glare that can cause temporary conjunctivitis and or temporary loss of vision, and blowing ice crystals when there is an expanse of snow coverage.
- Workers should be instructed in safety and health procedures related to cold environments work, including:
 - Proper rewarming procedures
 - First aid treatment
 - Proper eating and drinking habits
 - Recognition of impending frostbite
 - Recognition of signs and symptoms of impending hypothermia or excessive cooling of the body even when shivering does not occur.
 - Safe work practices

2.3 Workplace Monitoring

Suitable thermometry should be arranged at the any workplace where the environment is below 60.8° F (16° C) so that overall compliance with the TLV can be maintained. Whenever the air temperature falls below 30.2° F (-1° C), the dry bulb temperature should be measured and recorded at least every 4 hours.

Wind speed should be monitored and recorded when the rate exceeds 5 mph (2 m/s). When monitoring, the Equivalent Chill Temperature (ECT) should be recorded with the temperature and wind speed.

Individual employees should be excluded from working in cold at 30.2° F (-1° C) or below if they are suffering from diseases or taking medication which interferes with normal body temperature regulation or reduces tolerance to work in cold environments. Workers who are routinely exposed to temperatures below -11.2° F (-24° C) with no wind, or -18° F (0° C) with wind speeds above 5 mph should be medically evaluated as suitable for such temperatures.

Provisions for providing first aid for trauma sustained in freezing or subzero conditions are required because an injured worker is predisposed to cold injury and should be protected against preventing hypothermia or freezing of damaged tissues in addition to providing the first aid.

Table 1 - Cooling Power of Wind on Exposed Flesh Expressed as Equivalent Temperature (under calm conditions)*

Estimated Wind Speed (in mph)	Actual Temperature Reading (° F)												
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60	
	Equivalent Chill Temperatures (° F)												
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60	
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68	
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95	
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112	
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121	
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133	
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140	
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145	
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148	
Wind Speeds > 40 mph have little additional Effect	LITTLE DANGER In < hr with dry skin. Maximum danger of false sense of security			INCREASING DANGER Danger from freezing of exposed flesh within one minute				GREAT DANGER Flesh may freeze within 30 seconds					
	Trenchfoot and immersion foot may occur at any point on this chart												
	Grayed areas = Equivalent Chill Temperature requiring dry clothing to maintain core body temperature above 96.8° F (36° C) per cold stress TLV												

* Developed by U.S Army Research Institute of Environmental Medicine, Natick, MA. As provided in American Conference Of Governmental Industrial Hygienists TLVs and BEIs 2006

TABLE 2 – WORK/WARM-UP SCHEDULE FOR FOUR-HOUR SHIFT

Air Temperature Sunny Sky		No Noticeable Wind		5 mph Wind (8 k/hr)		10 mph Wind (16 K/hr)		15 mph Wind (24 k/hr)		20 mph Wind (32 k/hr)	
°F (Approx)	°C (Approx.)	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max Work Period	Number of Breaks	Max Work Period	Number of Breaks	Max Work Period	Number of Breaks
-15 to -19	-26 to -28	Normal breaks	1	Normal breaks	1	75 min.	2	55 min.	3	40 min.	4
-20 to -24	-29 to -31	Normal Breaks	1	75 min.	2	55 min.	3	40 min	4	30 min.	5
-25 to -29	-32 to 34	75 min.	2	55 min.	3	40 min.	4	30 min.	5	Non-Emergency work should cease	
-30 to -34	-35 to -37	55 min.	3	40 min.	4	30 min.	5	Non-Emergency work should cease			
-35 to -39	-38 to -39	40 min.	4	30 min.	5	Non-Emergency work should cease					
-40 to -44	-40 to -42	30 min.	5	Non-Emergency work should cease							
-45 & below	-43 & below	Non-Emergency work should cease									

Notes:

1 Schedule applies to any 4-hour work period with moderate to heavy work activity, with warm-up periods of ten (10) minutes in a warm location and with an extended break (e.g. lunch) at the end of the 4-hour work period in a warm location. For Light-to-Moderate Work (limited physical movement): apply the schedule one step low. For example, at -30 F (-35 C) with no noticeable wind (step 4), a worker at a job with little physical movement should have a maximum work period of 40 minutes with 4 breaks in a 4-hour period (step 5).

2. The following is suggested as a guide for estimating wind velocity if accurate information is not available: 5 mph - light flag moves, 10 mph – light flag fully extended, 15 mph – raises newspaper sheet, 20 mph – blowing & drifting snow.

3. TLVs apply only for workers in dry clothing.

EHS 5-1 : Personal Protective Equipment

**Last Revision By: Kennedy Lugo on
11/16/2010**

Created By: Lisa Kaminski on 06/21/2000

Purpose: The purpose of this program is to ensure that personal protective equipment (PPE) is selected in accordance with 29 CFR 1910.132, properly used and maintained, and that Tetra Tech EC, Inc. (TtEC) personnel are properly trained in the inspection, use and maintenance of PPE.

Version Date: 06/30/2000 - Revised

Original Issue Date: 01/01/95

Category: Company Procedures

Sections: ESQ - Environmental Health & Safety Programs

Sub Category: Departmental/Discipline

Document Type: Procedure

Keyword Index: Monitoring, Operational Control, Training

Document Owner: Grey Coppi

Approved By:



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1.0 PURPOSE

The purpose of this program is to ensure that personal protective equipment (PPE) is selected in accordance with 29 CFR 1910.132, properly used and maintained, and that Tetra Tech EC, Inc. (TtEC) personnel are properly trained in the inspection, use and maintenance of PPE.



2.0 SCOPE

This program applies to all TtEC operations including the activities of contractors on TtEC-managed projects.



3.0 MAINTENANCE

The Director, Environmental, Safety and Quality (ESQ) Programs is responsible for updating this procedure. Approval authority rests with TtEC's President and Chief Executive Officer. Suggestions for revision shall be submitted to both the department responsible for updating the procedure and the Executive Director Compliance and Corporate Counsel.



4.0 DEFINITION



4.1 Personal Protective Equipment (PPE)

Items which are worn and are designed to protect the health and safety of an employee. This includes, but it is not limited to, chemical resistant shoes, boots, gloves, chemical protective clothing, hard hats, safety glasses, hearing protection, cooling/heating vests, life-lines and harnesses, and respirators. Additional program requirements for respirators are provided in EHS 5-2, Respiratory Protection.



5.0 DISCUSSION



5.1 Responsibilities



5.1.1 All TtEC Personnel

All personnel required to use PPE are responsible for wearing the appropriate PPE when required, inspecting the PPE prior to use, properly wearing the PPE, and as necessary, properly maintaining the PPE.



5.1.2 Line Management

Site supervisors are responsible for understanding the specific PPE requirements for each project task and ensuring that PPE is provided and worn when required and in the intended manner.



5.1.3 Environmental, Health and Safety Personnel

The Project Environmental and Safety Manager (PESM) is responsible for:

- Ensuring that PPE is selected in accordance with the hazard assessment requirements of 29 CFR 1910.132 (d)
- Approving changes to PPE requirements through plan modifications or by incorporating criteria into the project plan which enable the Environmental and Safety Supervisor (ESS) to authorize changes to the PPE requirements.

ESS is responsible for:

- Monitoring PPE usage
- Recommending modifications to PPE requirements to project management and the PESM, as necessary
- Ensuring that project personnel have the proper training on the PPE which they are required to use, and performing training and retraining, as necessary
- Providing notifications to laundries which clean TtEC work clothing in accordance with 29 CFR 1910.120(k) (7).



5.2 Intended Use

PPE is intended for use when engineering controls, procedures, and/or work practices are not feasible, when control measures are shown to be ineffective for exposure minimization, when uncertainty exists regarding the nature and level of potential exposure, and as a precautionary measure to prevent exposure due to accidental releases of hazardous materials.



5.3 Hazard Assessment and Selection

Hazard assessments shall be performed during the preparation of all Environmental, Health and Safety (EHS) plan. See EHS 3-2 for a discussion of EHS Plans. The hazard assessment shall include consideration for:

- Potential chemical, physical and biological hazards present
- Work operations to be performed,
- Potential routes of exposure,
- Concentrations of contaminants present, and
- Characteristics, capabilities and limitations of PPE, and any hazards that the PPE presents or magnifies such as heat stress.

The EHS plan shall be used as the written documentation of the hazard assessment to comply with 29 CFR 1910.132(d)(2), and shall include the identification of the workplace evaluated, the person certifying that the evaluation has been performed, and the date(s) of the hazard assessment.



[5.4 PPE Requirements](#)

All PPE shall be of safe design and construction for the work to be performed and shall meet applicable ANSI standards and/or OSHA regulations.

PPE used exclusively for site work shall be provided at no cost to TtEC personnel. Leather safety shoes [and](#) prescription safety glasses are not provided to personnel by TtEC.

The office or site person responsible for issuance of PPE shall ensure that PPE properly fits each affected employee except that proper respirator fit will be evaluated in accordance with EHS 5-2, Respiratory Protection.

Eye and/or face protection shall be provided when hazards exist from flying particles, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation. Regarding eye and/or face protection:

- Side shields shall be used whenever site plans require the use of safety glasses. Employees who wear prescription lenses must use ANSI approved industrial prescription safety glasses with fixed side shields and/or prescription inserts for full face respirators as necessary to meet project requirements. The cost of eye examinations is the responsibility of the employee.
- Filter lenses for operations which involve injurious light radiation shall be in accordance with 29 CFR 1910.133(a)(5).
- A full face respirator is required whenever operations involve corrosive liquids and the operation requires the use of a respirator to provide for maximum eye protection; if the operation does not require a respirator, then splash goggles at a minimum shall be worn. Face shields are not a substitute for splash goggles.

Hard hats shall be provided whenever hazards from falling objects, overhead hazards, low clearance hazards exist, or required by project EHS plans.

Provisions shall be made in office locations for personnel to store and transport PPE required for field projects. Individuals shall be provided with equipment and an equipment bag large enough to hold the PPE normally required for the field projects which they support.



5.5 Work Clothing

TtEC's work uniform shall be cotton coveralls for personnel performing field work at hazardous waste sites. Exceptions to the cotton coverall requirement can be made by the PESH when the risk of contaminating personal clothing is remote. Personnel should not wear their personal clothing (other than undergarments and socks) under the cotton coveralls. Attachment A or an equivalent shall be used to notify the laundry.

Home laundering of company-provided work clothing is not allowed. Each office or project shall provide for laundering of work clothing. When an outside laundry service is utilized, the laundry shall be notified in accordance with 29 CFR 1910.120(k)(7). The sample letter included as Attachment A shall be used as a template for notification of laundries.

If work clothing becomes grossly contaminated with a hazardous material, i.e., requiring removal to prevent prolonged skin contact, the uniform is to be disposed of in the appropriate manner. Under no circumstances should grossly contaminated work clothing be taken home or sent to an outside laundry.



5.6 Inspection

Each employee is responsible for inspecting his/her PPE before and after each use.

Any damaged or defective PPE is to be taken out of service immediately, and repaired or replaced.

The Emergency Coordinator is responsible for ensuring that PPE maintained for emergency use is inspected as necessary.



5.7 Cleaning, Maintenance, and Disposal

Used, disposable PPE items are placed in containers at job sites for disposal. The PESM shall determine the proper method of disposal.

Non-disposable items such as hard hats and rubber boots are to be decontaminated at the job site. Personnel are responsible for cleaning their own PPE after each work shift unless other arrangements are made for the project. Site-specific cleaning procedures are listed in the EHS plans for each job site.

Non-disposable PPE is stored in the employees' lockers, equipment bags, or other suitable locations when not in use.



5.8 Medical Evaluation

Medical surveillance examinations for personnel required to wear PPE will include an evaluation of the person's ability to tolerate the physical stresses posed by protective equipment. See EHS 4-5, Medical Surveillance, for additional information regarding the TtEC medical surveillance program.



5.9 Training



5.9.1 Initial Training

Training in PPE inspection, use and maintenance is conducted as part of the initial hazardous waste 40-hour training. This training provides personnel with an understanding of the inspection, use (including donning, doffing, adjusting, and wearing), limitations, care, and maintenance of PPE.



5.9.2 Site-Specific Orientation

Site-specific orientations shall be used to communicate selection decisions to site personnel to meet the requirements of 29 CFR 1910.132(d)(1)(ii). The site-specific orientation shall ensure that site personnel:

- Understand when PPE is necessary, what PPE is necessary, the limitations of the PPE, and the proper disposal of the PPE;
- Understand how to use the specific PPE required by the project; and
- Has retained the basic PPE knowledge from the initial training.



5.9.3 Retraining

Retraining shall be performed:

- Whenever TtEC personnel have reason to believe that a person does not have the requisite understanding and skill to properly and safely use PPE;
- When changes in the workplace or work plans require modifications to the types of selected PPE; and
- As necessary, to inform TtEC personnel of changes to the requirements of this program.



5.10 Documentation

PPE training shall be documented through a written certification that contains the name of each person trained, the date(s) of the training, and the identification of the subject of the certification. Training certification may be accomplished as follows:

- For initial, supervisor and refresher training, TtEC shall maintain a copy of the course agenda in conjunction with the course certificate.
- For site-specific orientation, site-specific training and required retraining, the training sign-in sheet shall contain the required information identified above.

Training records shall be maintained in accordance with EHS 1-9, Recordkeeping.



6.0 REFERENCES

29 CFR 1910.120(k)(7), Hazardous Waste Operations and Emergency Response.

29 CFR 1910.132, Personal Protective Equipment, General Requirements.

29 CFR 1910.133, Personal Protective Equipment, Eye and Face Protection.

29 CFR 1910.134, Respiratory Protection.

Environmental, Health & Safety - Programs Procedure EHS 1-9, Recordkeeping 

Environmental, Health & Safety - Programs Procedure EHS 3-2, Environmental, Health & Safety Plan(s) 

Environmental, Health & Safety - Programs Procedure EHS 4-5, Medical Surveillance 

Environmental, Health & Safety - Programs Procedure EHS 5-2, Respiratory Protection 

OSHA (U.S. Department of Labor, Occupational Safety and Health Administration)



7.0 ATTACHMENTS

[Attachment A - Laundry Notification Letter](#)



EHS 5-1 ATTACHMENT A LAUNDRY NOTIFICATION LETTER

Click the icon below to launch or download.



EHS 5-1 Attachment A.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

Tetra Tech EC, Inc.

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EHS 5-1 ATTACHMENT A



TETRA TECH EC, INC.

LAUNDRY NOTIFICATION LETTER

Date

XYZ Laundry
Clean Street
Whitewash, NJ 12345

To Whom It May Concern:

The purpose of this letter is to inform you of the nature of the operations at Tetra Tech EC, Inc. (TtEC) ABC Project, to provide you with information on the site contaminants, and to document the notification required by OSHA 29 CFR 1010.120(k)(7).

TtEC's ABC Project involves the (Provide information on the general scope of the project in two or three sentences).

The known contaminants at the site include (Provide or attach a listing of the known site contaminants). The levels of these contaminants in the (State media) are (Describe general levels of contaminants). The potential health hazards of from these contaminants are (Describe potential health hazards from exposure or attach information from the HASP).

Personnel at this site wear outer disposable clothing which minimizes contamination of the clothing which you receive for laundering. (Modify previous sentence if disposable clothing is not worn or not worn for all job tasks. When disposable clothing is not worn, explain why not and why contamination of the clothing would be minimal.) In addition, any clothing which becomes grossly contaminated will be disposed of in an appropriate manner and will not be sent to you for laundering.

Please provide your employees with the above information. If you have any questions, do not hesitate to contact me or (Name of PESM or ESO).

Sincerely,
TETRA TECH EC, INC.

John Smith
Project Manager

cc: Project EHS File

EHS 5-2 : Respiratory Protection

**Last Revision By: Kennedy Lugo on
11/16/2010**

Created By: Lisa Kaminski on 02/29/2000

Purpose:	The purpose of this program is to establish minimum requirements for the proper selection, use, and care of respiratory protection equipment by workers at Tetra Tech EC, Inc. (TtEC) project sites and to ensure compliance with OSHA, 29 CFR 1910.134.		
Version Date:	04/04/2000 - Revised	Original Issue Date:	02/01/95
Category:	Company Procedures	Sections:	ESQ - Environmental Health & Safety Programs
Sub Category:	Departmental/Discipline	Document Type:	Procedure
Keyword Index:	Monitoring, Operational Control, Training	Document Owner:	Grey Coppi
Approved By:			

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1.0 PURPOSE

The purpose of this program is to establish minimum requirements for the proper selection, use, and care of

respiratory protection equipment by workers at Tetra Tech EC, Inc. (TtEC) project sites and to ensure compliance with OSHA, 29 CFR 1910.134.



2.0 SCOPE

This program applies to all TtEC operations.



3.0 MAINTENANCE

The Director, Environmental, Safety and Quality (ESQ) Programs is responsible for updating this procedure. Approval authority rests with TtEC's President and Chief Executive Officer. Suggestions for revision shall be submitted to both the department responsible for updating the procedure and the Executive Director Compliance and Corporate Counsel.



4.0 DEFINITIONS



4.1 Hazardous Atmosphere

Any atmosphere containing a potentially toxic gas, vapor, dust, fume, mist, or pesticide, or any oxygen-deficient atmosphere.



4.2 Oxygen-Deficient Atmosphere

An atmosphere containing less than 19.5 percent oxygen by volume at sea level.



5.0 DISCUSSION



5.1 Responsibilities



5.1.1 Line Management

Site supervisors are responsible for ensuring that the proper respiratory protective equipment (RPE) is used when required in accordance with the site Environmental, Health and Safety (EHS) plans in the intended manner.



5.1.2 Environmental, Health and Safety Personnel

The Environmental and Safety Coordinators (ESC) are responsible for ensuring that personnel based in their

office receive annual training and fit testing for RPE.

The Project Environmental and Safety Manager (PESM) is responsible for selection and specification of RPE in accordance with the requirements of this program, EHS 5-1 (Personal Protective Equipment) and EHS 3-2 (EHS Plans), and applicable regulations.

The Environmental and Safety Supervisor (ESS) is responsible for:

- Ensuring that personnel have the necessary training and fit testing for the use of each type of respirator and ensuring that proper documentation is available
- Monitoring the use of RPE
- Ensuring that RPE is maintained and inspected in accordance with the EHS plans and program requirements
- Evaluating the effectiveness of the respiratory protection program on each site, and
- Recommending changes to the types of RPE being used, as necessary.



5.1.3 Corporate Medical Consultant

The Corporate Medical Consultant (CMC) is responsible for providing clearance for TtEC personnel to use RPE in accordance with EHS 4-5, Medical Surveillance.



5.2 Selection of Respiratory Protective Equipment

All respiratory equipment utilized on TtEC projects shall be certified by the National Institute for Occupational Safety and Health/Mine Safety and Health Administration (NIOSH). The type of respiratory protection selected is based upon potential hazards at a specific site. Selection of appropriate respiratory protection is documented in the EHS plans (see procedure PO-1, Project Management Planning.) and approved by the ESQ Regional Manager, PESM and/or a Certified Industrial Hygienist.

There are three general classes of respiratory protection available:

- Self-contained breathing apparatus (SCBA),
- Air-supplied devices, and
- Air-purifying devices.

To select which type of respiratory protection is appropriate for a given project, the following questions must be answered:

1. Is there a possibility of an oxygen-deficient atmosphere?
2. Are the contaminants and concentrations in the worker breathing zones known or unknown?
3. What are the allowable concentration limits (permissible exposure limits or threshold limit values) for the contaminants? What are their physical properties?
4. What are the maximum expected concentrations of known contaminants? Are the concentrations Immediately Dangerous to Life and Health (IDLH)?
5. What is the expected duration of personnel exposure?
6. What are the warning properties and symptoms of the contaminants?
7. Can the contaminant be absorbed through the skin and/or eyes?

8. Are the contaminants flammable?

9. Is there any other pertinent information concerning the contaminants that may be pertinent to selecting appropriate respiratory protection?

Atmosphere-supplying respirators (i.e., pressure demand SCBAs or airline systems) shall be used when one of the following occurs: 1) the hazardous substance has been identified and requires the highest level of protection based on the measured (or potential for) high concentration of atmospheric vapors, gases, or particulates; 2) site operations involve a high potential for splash, immersion, or exposure to unexpected vapors, gases, or particulates; or 3) operations are being conducted in confined, poorly ventilated areas that could contain hazardous concentrations of atmospheric vapors, gases, or particulates and/or reduced oxygen concentrations less than 19.5 percent. Escape packs are used with all airline systems. Note: Employees shall not be required to enter atmospheres that are immediately dangerous to life or health without the approval of the Project Environmental and Safety Manager, or without specific hazardous atmosphere rescue training.

Negative pressure air purifying respirators, equipped with appropriate filter cartridges for the expected contaminants, may be used only when the atmospheric contaminants have been identified, and expected concentrations are within limits that can be effectively removed by the respirator cartridges. For air purifying respirators used for protection against gases or vapors, a cartridge change schedule shall be included in the EHS Plan along with a description of the information or data relied upon to develop the schedule. In most cases this will consist of recommendations by the manufacturers when they become available.



5.3 Fit Testing

A qualitative fit test shall be conducted for each employee during the initial 40-hour health and safety training course and/or at site-specific training and annually thereafter. Fit testing may also be performed when a condition that may effect the face fit of the respirator has occurred, such as weight gain or loss, dental work, facial surgery, or deformity. Employees shall be clean shaven during fit testing.

Qualitative fit tests shall be administered using irritant smoke or Bitrex in accordance with the OSHA respiratory protection standard in 29 CFR 1910.134, Appendix A. ([Attachment A of this procedure contains the protocol for the irritant smoke test. If using the Bitrex test kit, follow the protocol in the OSHA standard.](#))

Qualitative Fit testing will be limited to situations where a negative pressure respirator is used and a protection factor of 10 or less is needed. If a protective factor of greater than 10 is needed, the EHS plan will require either a positive pressure/pressure demand respirator or quantitative fit-testing of the negative pressure respirator.

All positive pressure/pressure demand respirators with tight-fitting facepieces will be fit-tested qualitatively or quantitatively in the negative pressure mode.

A record of the fit test shall be maintained utilizing the qualitative respirator fit test record form (Attachment B). Records of employee respiratory protection training shall be maintained by each office ESC and by the ESS in each project file.



5.4 Respirator Use

All TtEC personnel are required to:

- Use RPE when required and in the proper manner;
- Inspect RPE prior to each use and obtain replacement equipment when found to be defective;
- Perform a user seal check each time they put on a tight-fitting respirator;
- Take proper care of the RPE;
- Be clean shaven where the seal of the respirator contacts the face whenever using RPE; and

- Leave the respirator use areas whenever necessary to wash their face or respirator to avoid skin irritation; if they detect contaminant breakthrough, a change in breathing resistance, or leakage of the facepiece; or to change filters or cylinders.

Low temperatures may fog the lenses of the respirator and use of anti-fog spray and a nose cup may be beneficial. Nose cups are part of the NIOSH approval for air supplied respirators at ambient temperatures of 32° F and below. Minimum temperatures recommended by the manufacturer for operation of a SCBA shall be consulted prior to use in low temperatures.

Under no circumstances are employees permitted to use escape provisions of atmosphere-supplying respirators for routine and egress of work areas.

Wearing any respirator in conjunction with other types of protective equipment will impose some physiological stress on the wearer. Use of respirators in conjunction with protective clothing can greatly affect human response and endurance, especially in hot environments. See EHS 4-6, Temperature Extremes, for additional information.



5.5 Cleaning and Storage

Each person has the responsibility to clean, disinfect, and care for their respirator in accordance with the training they have received. The following procedure shall be followed for cleaning and storage of respiratory protection equipment.

- Personal respirators shall be cleaned and disinfected after each day's use, or more frequently, if necessary.
- Respirators for emergency use and all SCBAs shall be cleaned and inspected after each use, and inspected on a monthly basis. Monthly inspections shall be documented, including serial number, date, findings, and remedial action and signature inspector.
- Routine cleaning shall be completed as follows:
 - Remove the filters and dispose of per the EHS plan's requirements, if applicable.
 - Wash respirator in disinfecting solution.
 - Rinse respirator in clean water.
 - Allow respirator adequate time to air dry.
- Routine inspection shall be completed as follows:
 - Check all connections for gaskets and "O" rings and proper tightness.
 - Check the condition of the face piece and its parts for tears, cracks, abrasions, or brittleness.
 - Check the condition of the connecting air hose, regulator, and harness, if applicable.
 - Check the condition of the headband for tears, cracks, abrasions, or brittleness.
 - Inspect all rubber or elastic parts for pliability and signs of deterioration.
 - Check alarms, if applicable
 - Report any worn, missing, or broken parts to health and safety personnel on site.
- Clean and dry respirators shall be stored in zippered plastic bags. These bags shall be placed in a clean, dry place out of direct heat and sunlight.
- Repairs and parts replacements will only be made by individuals trained to do so using only the manufacturer's NIOSH approved parts. Only manufacturers or technicians trained by the manufacturer can repair/replace reducing and admission valves, regulators and alarms.



5.6 Air Monitoring of Work Areas

To determine if the selected respiratory protection is appropriate, the work area shall be monitored for contaminant concentrations at the beginning of each phase of work activity as required by the site safety plan. Sampling should be in the breathing zone of the exposed employee. Periodic sampling throughout the project will be conducted per the EHS plans to ensure that the selected respirator protection is appropriate.



5.7 Evaluation of the Program

Site supervisors and the ESS shall monitor the project implementation of the respiratory program during routine and informal inspections. PESM will perform evaluations of project implementation of the program during EHS inspections. The inspections shall include consultation with affected employees required to use respirators. The Director, Health and Safety Programs will evaluate overall program implementation through a review of inspection reports, incident reports and investigations, and audit reports.

See C-2, Audits, and EHS 3-3, Inspections, for information on the TtEC audit and inspection programs.



5.8 Medical Surveillance

Site personnel shall meet the medical surveillance requirements of OSHA 29 CFR 1910.134, 1910.120 and EHS 4-5, Medical Surveillance, for respirator use prior to engaging in any field work requiring or potentially requiring the use of a respirator. Personnel with medical conditions which prevent or limit their ability to wear a respirator shall be notified in writing by the CMC.



5.9 IDLH Atmospheres

TtEC personnel shall immediately evacuate areas where an IDLH atmosphere develops. TtEC personnel shall not enter IDLH atmospheres except for rescue or when authorized by the PESM. If necessary, at least one standby person equipped with proper rescue equipment and a pressure demand SCBA is present. Communication between the field team and the standby person is maintained at all times. If the IDLH atmosphere exists in a confined space, the entry shall be conducted in accordance with EHS 6-1, Confined Space Entry.



5.10 Training

Personnel required to use respiratory protection shall be trained in the selection, use, and maintenance of the equipment. Respiratory protection training is included as part of the initial health and safety training, the 8-hour refresher course, and the site-specific training described in EHS 1-11, Training. The training shall be conducted annually. Site-specific respiratory protection training includes the following:

- Hazard identification to include symptoms of exposure;
- Use of engineering controls to minimize exposure, and an explanation of why engineering controls are not feasible;
- A description of the type of respiratory protection chosen and the protection provided to the employee;
- Assurance that the employee understands the protection capabilities and limitations of the method of respiratory protection utilized;
- Recognition of medical signs and symptoms that may limit or prevent effective use of respirators;
- A thorough demonstration of the selected method of respiratory protection to include how to put it on, how to check the seals, use, troubleshooting, and maintenance followed by hands-on training by the employee;
- How to use the respirator in an emergency, including situations in which the respirator malfunctions; and
- A description of the on-site storage and maintenance facilities for maintaining respiratory protection equipment.

Training records shall be maintained in accordance with EHS 1-9, Recordkeeping.



6.0 REFERENCES

29 CFR 1910.120, Hazardous Waste Operations and Emergency Response.

29 CFR 1910.134, Respirator Protection.

[Compliance Procedure C-2, Audits](#)

[Environmental, Health & Safety - Programs Procedure EHS 1-9, Recordkeeping](#)

[Environmental, Health & Safety - Programs Procedure EHS 1-11, Training](#)

[Environmental, Health & Safety - Programs Procedure EHS 3-2, Environmental, Health & Safety Plan\(s\)](#)

[Environmental, Health & Safety - Programs Procedure EHS 3-3, Inspections](#)

[Environmental, Health & Safety - Programs Procedure EHS 4-5, Medical Surveillance](#)

[Environmental, Health & Safety - Programs Procedure EHS 4-6, Temperature Extremes](#)

[Environmental, Health & Safety - Programs Procedure EHS 5-1, Personal Protective Equipment](#)

[Environmental, Health & Safety - Programs Procedure EHS 6-1, Confined Space Entry](#)

OSHA (U.S. Department of Labor, Occupational Safety and Health Administration)

[Project Initiations/Operations Procedure PO-1, Project Management Planning](#)



7.0 ATTACHMENTS

[Attachment A - Irritant Fume Protocol](#)

[Attachment B - Qualitative Respirator Fit Test Form](#)



[EHS 5-2 ATTACHMENT A IRRITANT FUME PROTOCOL](#)

Click the icon below to [launch or download](#).



EHS 5-2 Attachment A.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.



[EHS 5-2 ATTACHMENT B QUALITATIVE RESPIRATOR FIT TEST RECORD](#)

Click the icon below to [launch or download](#).



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EHS 5-2 ATTACHMENT A



IRRITANT FUME PROTOCOL

1. The test subject shall be allowed to smell a weak concentration of the irritant smoke to familiarize him with the characteristic odor of each.
2. The test subject shall properly don the respirator selected as above, and wear it for at least 10 minutes before starting the fit test.
3. The test conductor shall review this protocol with the test subject before testing.
4. The test subject shall perform the conventional positive pressure and negative pressure fit checks. Failure of either check shall be cause to select an alternate respirator.
5. Break both ends of a ventilation smoke tube containing stannic oxychloride, such as the MSA part No. 5645, or equivalent. Attach a short length of tubing to one end of the smoke tube. Attach the other end of the smoke tube to a low pressure air pump set to deliver 200 milliliters per minutes.
6. Advise the test subject that the smoke can be irritating to the eyes and instruct him to keep his eyes closed while the test is performed.
7. The test conductor shall direct the stream of irritant smoke from the tube towards the face seal area of the test subject. The test conductor shall begin at least 12 inches from the facepiece and gradually move to within one inch, moving around the whole perimeter of the mask.
8. The following exercises shall be performed while the respirator seal is being challenged by the smoke. Each shall be performed for one minute.
 - i. Normal breathing.
 - ii. Deep breathing. Be certain breaths are *deep* and *regular*.
 - iii. Turning head from side-to-side. Be certain movement is complete. Alert the test subject not to bump the respirator on the shoulders. Have test subject inhale when his head is at either side.
 - iv. Nodding head up-and down. Be certain motions are complete. Alert the test subject not to bump the respirator on the chest. Have the test subject inhale when his head is in the fully up position.
 - v. Talking - slowly and distinctly, count backwards from 100, or read the rainbow passage which follows this protocol.
 - vi. Normal breathing.

EHS 5-2 ATTACHMENT A
IRRITANT FUME PROTOCOL

9. If the irritant smoke produces an involuntary reaction (cough) by the test subject, the test conductor shall stop the test. In this case the tested respirator is rejected and another respirator shall be selected.
10. Each test subject passing the smoke test without evidence of a response shall be given a sensitivity check of the smoke from the same tube to determine whether he reacts to the smoke. Failure to evoke a response shall void the fit test.
11. Steps B4, B7, B8 of this protocol shall be performed in a location with exhaust ventilation sufficient to prevent general contamination of the testing area by the irritant smoke.
12. Respirator successfully tested by the protocol may be used in contaminated atmospheres up to ten times the PEL. In other words, this protocol may be used to assign protection factors not exceeding ten.

RAINBOW PASSAGE

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

EHS 5-2 ATTACHMENT B

 **TETRA TECH EC, INC.**
QUALITATIVE RESPIRATOR FIT TEST RECORD

Date of Test: _____ Project/Location: _____

Print Name: _____ Print Tester's Name: _____

	TEST 1	TEST 2	TEST 3
Respirator Manufacturer			
Model			
Facepiece style			
Size			
Type cartridge used for test			
Positive/negative pressure check (Pass or Fail)			
Test agent (Irritant fume or Isoamyl acetate)			
Sensitive to test agent (Yes or No)			
Normal breathing (Pass or Fail)			
Deep breathing (Pass or Fail)			
Moving head side to side (Pass or Fail)			
Speaking - (Pass or Fail)			
Bending (Pass or Fail)			
Jogging (Pass or Fail)			
Normal breathing (Pass or Fail)			
Passed test (Yes or No)			

I understand the limitations of the respirator(s) for which I was tested; how to inspect, use, and maintain the respirator; and, how to obtain information about the respirator use requirements on the project(s) on which I work. I also understand that it is my responsibility to inspect my respirator prior to each use.

Signature of Person Tested: _____

The fit test(s) was performed according to the fit test procedure specified in the Tetra Tech EC, Inc. Respiratory Protection Program, EHS 5-2.

Signature of Tester: _____

EHS 6-3 : Excavation and Trenching

**Last Revision By: Kennedy Lugo on
11/16/2010**

Created By: Lisa Kaminski on 05/14/2001

Purpose:	This program provides the requirements for activities involving excavations in accordance with 29 CFR 1926, Subpart P - Excavations.		
Version Date:	07/03/2001 - Revised	Original Issue Date:	02/01/95
Category:	Company Procedures	Sections:	ESQ - Environmental Health & Safety Programs
Sub Category:	Departmental/Discipline	Document Type:	Procedure
Keyword Index:	EHS Compliance/Waste Management, Field Activities/Science, Operational Control, Training, Monitoring	Document Owner:	Grey Coppi
Approved By:			

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1.0 PURPOSE

This program provides the requirements for activities involving excavations in accordance with 29 CFR 1926, Subpart P - Excavations.



2.0 SCOPE

These requirements are applicable to all Tetra Tech EC, Inc. (TtEC) operations.



3.0 MAINTENANCE

The Director, Environmental, Safety and Quality (ESQ) Programs is responsible for updating this procedure. Approval authority rests with TtEC's President and Chief Executive Officer. Suggestions for revision shall be submitted to both the department responsible for updating the procedure and the Executive Director Compliance and Corporate Counsel.



4.0 DEFINITIONS



4.1 Benching

A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.



4.2 Competent Person

A competent person is one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.



4.3 Excavation

Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.



4.4 Hazardous Atmosphere

An atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.



4.5 Protective Systems

A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.



4.6 Sloping

A method of protecting employees from cave-ins by forming sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.



4.7 Support System

A structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.



4.8 Trench

A narrow excavation made below the surface of the ground. In general the depth is greater than the width, but the width of a trench measured at the bottom is not greater than 15 feet. If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet or less, the excavation is also considered to be a trench.



5.0 DISCUSSION



5.1 Responsibilities



5.1.1 Competent Person

The competent person(s) shall be responsible for:

- Day-to-day oversight of open excavations and trenches
- Conducting soil classifications
- Selection of protective systems
- Conducting daily inspections of open excavations and trenches; and
- Providing the Environmental and Safety Supervisor (ESS) with all required documentation on a daily basis.



5.1.2 Line Management

The Project Manager (PM) shall be responsible for:

- Ensuring compliance with this procedure
- Providing the necessary resources for compliance with this procedure; and
- Designating competent personnel in consultation with the Project Environmental, Health and Safety Manager (PESM)



5.1.3 Environmental, Health and Safety Personnel

The ESS shall be responsible for:

- Providing oversight on the implementation of the requirements contained in this procedure
- Conducting periodic reviews of open trenches and excavations
- Consulting with the project manager and competent person on excavation issues; and
- Maintaining required records.



5.2 Designation of Competent Personnel

Prior to the start of any excavation work the project manager shall designate a competent person to fulfill the requirements of this procedure.



5.3 General Requirements

The following section provides general requirements governing activities in and around excavation and trenches, as well as the requirements for the selection and use of protective systems.

- Surfaces surrounding open trenches and excavations shall have all surface hazards removed.
- All utilities shall be located and cleared prior to initiating digging. Public or facility utility groups shall be utilized where possible for this purpose. In the absence of either, the ESS shall specify the procedures to be used to clear utilities in consultation with the project PESH and project manager. When the excavation is open, utilities shall be supported and protected from damage. Clearance and support methods shall be documented on the daily inspection checklist.
- Where structural ramps are used for egress they shall be installed in accordance with 29 CFR 1926.651(c)(1).
- Stairways, ladders, or ramps shall be provided as means of egress in all trenches 4 feet or more in depth. Travel distance shall be no more than 25 feet between means of exit.
- Employees exposed to vehicular traffic shall wear traffic vests.
- No employee shall be permitted under loads being lifted or under loads being unloaded from vehicles.
- When vehicles and machinery are operating adjacent to excavations warning systems such as stop logs or barricades shall be utilized to prevent vehicles from entering the excavation or trench.
- Scaling or barricades shall be used to prevent rock and soils from falling on employees.
- Excavated and loose materials should be kept at least 3 feet from the edge of excavations, but at a minimum

[of 2 feet from the edge of the excavation in accordance with OSHA requirements.](#)

- Walkways or bridges with standard railing shall be provided at points employees are to cross over excavations or trenches.
- Barriers shall be provided to prevent personnel from inadvertently falling into an excavation.



5.4 Hazardous Atmospheres

Where atmospheres containing less than 19.5 percent oxygen or other types of hazardous atmospheres may exist the following requirements shall be implemented.

- Atmospheric testing shall be done prior to employees entering excavations 4 feet or greater in depth.
- Testing methods shall be listed on the daily inspection checklist and results documented daily in field logs.
- Control measures such as ventilation and personal protective equipment (PPE) shall be used to control employee exposure to hazardous atmospheres below published exposure limits.
- Ventilation shall be used to control flammable and combustible vapors to below 10 percent of their lower explosive limit.
- Testing shall be repeated as often as necessary to ensure safe levels of airborne contaminants.
- Emergency equipment shall be provided and attended when the potential for a hazardous atmosphere exists. This equipment shall include but not be limited to emergency breathing apparatus, harnesses, lifelines, and basket stretchers. Required equipment will be listed on the daily inspection checklist and reviewed daily.



5.5 Protection From Water Hazards

When water has collected or is collected in excavations and trenches the following requirements shall be applied.

- Employees shall not work in excavations in which water has, or is, accumulating without the use of additional protection such as special support systems or water removal.
- Water removal shall be monitored by a competent person.
- Barriers such as ditches and dikes shall be used to divert runoff from excavations and trenches.
- Trenches shall be reinspected prior to re-entry after water accumulation due to heavy rainfall or seepage.



5.6 Stability of Adjacent Structures

When excavating or trenching near an adjacent structure the following practices shall be implemented.

- Support systems such as shoring, bracing, or underpinning shall be provided where the stability of buildings, walls, or other structures is endangered by excavation.
- Excavation bases or footings of foundations shall be prohibited unless support systems are used, the excavation is in stable rock, a professional engineer has determined the structure is sufficiently removed from the site as to not pose a hazard, or the PE determines that the excavation shall not pose a hazard to employees due to the structure.
- Support systems shall be used when it is necessary to undermine sidewalks, pavements, and appurtenant

structures.

- Surcharge load sources and adjacent encumbrances shall be listed with their evaluation date on the daily inspection checklist.



5.7 Daily Inspections

Inspections shall be performed daily on all excavations, adjacent areas, and protective systems before personnel enter the trench. The checklist provided in Attachment A or equivalent shall be used.



5.8 Soil Classification

To perform soil classification, the competent person shall use a thumb test, pocket penetrometer, or shear vane to determine the unconfined compressive strength of the soils being excavated. In soils with properties that change (i.e., one soil type mixed with another within a given area) several tests may be necessary. When different soil types are present the overall classification shall be that of the type with the lowest unconfined compressive strength. Classifications shall result in a soil rating of Stable Rock, Type A, Type B, or Type C in accordance with 29 CFR 1926.652, Appendix A. Soil classifications shall be listed on the daily inspection checklist. The soils analysis checklist provided in Attachment B or equivalent shall be used for soil classifications.



5.9 Sloping and Benching

All sloping and benching shall be done in accordance with 29 CFR 1926.652, Appendix B. Selection of the sloping method and evaluation of surface surcharge loads shall be made by a competent person familiar with the requirements contained therein. Sloping and benching methods and specifications shall be listed on the daily inspection checklist.



5.10 Protective Systems

Protective systems are required on all excavations over 5 feet in depth or in excavations less than 5 feet when examination of the ground by a competent person reveals conditions that may result in cave-ins.

Selection and installation of protective systems shall be done in accordance with 29 CFR 1926.652, Appendices C & D, or manufacturers data for shoring and shielding systems. Selection of a protective system shall be made based upon soil classification and job requirements by a competent person. Protective systems and specifications shall be listed on the daily inspection checklist.



5.11 Training

Competent persons shall have an adequate combination of experience and training to classify soil types and select protective systems as outlined in 29 CFR 1926.652. Training and experience pertaining to qualification as a competent person shall be documented and include the following:

- General safety practices related to working in or near open excavations;
- Inspection requirements and techniques;
- Classification of soils in accordance with 29 CFR 1926.652, Appendix A; and

- Uses, limitations, and specifications of protective systems in accordance with 29 CFR 1926.652.

Training records shall be maintained in accordance with EHS 1-9, Recordkeeping.



6.0 REFERENCES

29 CFR 1926, Subpart P, Excavations.

Environmental, Health & Safety - Programs Procedure EHS 1-9, Recordkeeping 
OSHA (U.S. Department of Labor, Occupational Safety and Health Administration),



7.0 ATTACHMENTS

Attachment A - Daily Excavation Inspection Checklist

Attachment B - Soils Analysis Checklist



EHS 6-3 ATTACHMENT A DAILY EXCAVATION INSPECTION CHECKLIST

Click the icon below to launch or download.



EHS 6-3 Attachment A 04-03-03.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.



EHS 6-3 ATTACHMENT B SOILS ANALYSIS CHECKLIST

Click the icon below to launch or download.



EHS 6-3 Attachment B.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

Tetra Tech EC, Inc.

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EHS 6-3 ATTACHMENT A



TETRA TECH EC, INC.

DAILY EXCAVATION INSPECTION CHECKLIST

To be completed by a "Competent Person"

Site location	_____		
Date	_____	Time	_____
Competent Person		_____	
Soil Type(s)	_____		
Soil Classification(s)	_____	Excavation depth	_____
		Excavation width	_____
Type of protective system used	_____		

Indicate for each item by circling: Y (Yes), N (No), - Address in Comments, Not Applicable (N/A.)

I. General Inspection of Job Site

- | | | | |
|--|---|---|-----|
| A. Surface encumbrances removed or supported | Y | N | N/A |
| B. Employees protected from loose rock or soil that could pose a hazard by falling or rolling into the excavation | Y | N | N/A |
| C. Hard hats worn by all employees | Y | N | N/A |
| D. Spoils, materials, and equipment set back at least 2 feet from the edge of the excavation | Y | N | N/A |
| E. Barriers provided at all remotely located excavations, wells, pits, shafts, etc. | Y | N | N/A |
| F. Walkways and bridges over excavations 4 feet or more in depth are equipped with standard guardrails | Y | N | N/A |
| G. Warning vests or other highly visible clothing provided and worn by all employees exposed to public vehicular traffic | Y | N | N/A |
| H. Warning system established and utilized when mobile equipment is operated near the edge of the excavation | Y | N | N/A |
| I. Employees prohibited from working on the faces of sloped or benched excavations above other employees | Y | N | N/A |

II. Utilities

- | | | | |
|--|---|---|-----|
| A. Utility companies contacted and/or utilities located | Y | N | N/A |
| B. Exact location of utilities marked when approaching the utilities | Y | N | N/A |
| C. Underground installations protected, supported or removed when excavation is open | Y | N | N/A |

III. Means of Access and Egress

- | | | | |
|---|---|---|-----|
| A. Lateral travel to means of egress no greater than 25 feet in excavations 4 feet or more in depth | Y | N | N/A |
| B. Ladders used in excavations secured and extended 3 feet above the edge of the trench | Y | N | N/A |
| C. Structural ramps used by employees designed by a competent person | Y | N | N/A |
| D. Structural ramps used for equipment designed by a registered professional engineer (RPE) | Y | N | N/A |
| E. Ramps constructed of materials of uniform thickness, cleated together on the bottom, equipped with a no-slip surface | Y | N | N/A |
| F. Employees protected from cave-ins when entering or exiting the excavation | Y | N | N/A |

**EHS 6-3 ATTACHMENT A
DAILY EXCAVATION INSPECTION CHECKLIST**

IV. Wet Conditions

- | | | | |
|---|---|---|-----|
| A. Precautions taken to protect employees from the accumulation of water | Y | N | N/A |
| B. Water removal equipment monitored by a competent person | Y | N | N/A |
| C. Surface water or runoff diverted or controlled to prevent accumulation in the excavation | Y | N | N/A |
| D. Inspections made after every rainstorm or other hazard increasing occurrence | Y | N | N/A |

V. Hazardous Atmospheres

- | | | | |
|---|---|---|-----|
| A. Atmosphere within the excavation tested where there is a reasonable possibility of an oxygen deficiency, combustible or other harmful contaminant exposing employees to a hazard | Y | N | N/A |
| B. Ventilation | Y | N | N/A |
| C. Testing conducted often to ensure that the atmosphere remains safe | Y | N | N/A |
| D. Emergency equipment, such as breathing apparatus, safety harness and line, and basket stretcher readily available where hazardous atmospheres could or do exist | Y | N | N/A |
| E. Safety harness and life line used and individually attended when entering deep confined excavations | Y | N | N/A |

VI. Support Systems

- | | | | |
|--|---|---|-----|
| A. Materials and/or equipment for support systems selected based on soil analysis, trench depth and expected loads | Y | N | N/A |
| B. Materials and equipment used for protective systems inspected and in good condition | Y | N | N/A |
| C. Materials and equipment not in good condition have been removed from service | Y | N | N/A |
| D. Damaged materials and equipment used for protective systems inspected by a RPE after repairs and before being placed back into service | Y | N | N/A |
| E. Protective systems installed without exposing employees to the hazards of cave-ins, collapses or from being struck by materials or equipment | Y | N | N/A |
| F. Members of support system securely fastened to prevent failure | Y | N | N/A |
| G. Support systems provided to insure stability of adjacent structures, buildings, roadways, sidewalks, walls, etc. | Y | N | N/A |
| H. Excavations below the level of the base or footing approved by an RPE | Y | N | N/A |
| I. Removal of support systems progresses from the bottom and members are released slowly as to note any indication of possible failure | Y | N | N/A |
| J. Backfilling progresses with removal of support system | Y | N | N/A |
| K. Excavation of material to a level no greater than 2 feet below the bottom of the support system and only if the system is designed to support the loads calculated for the full depth | Y | N | N/A |
| L. Shield system placed to prevent lateral movement | Y | N | N/A |
| M. Employees are prohibited from remaining in shield system during vertical movement | Y | N | N/A |

VII. Comments

EHS 6-3 ATTACHMENT B



TETRA TECH EC, INC.

SOILS ANALYSIS CHECKLIST

This checklist must be completed when soil analysis is made to determine the soil type(s) present in the excavation. A separate analysis must be performed on each layer of soil in excavation walls. A separate analysis must also be performed if the excavation (trench) is stretched over a distance where soil type may change.

Site location: _____

Date: _____ Time: _____ Competent Person _____

Where was the sample taken from? _____

Excavation: Depth: _____ Width: _____ Length: _____

VISUAL TEST

Particle type: _____ Fine Grained (cohesive) _____ Course grained (sand or gravel)

Water conditions: _____ Wet _____ Dry _____ Surface water present _____ Submerged

Previously disturbed soils? _____ Yes _____ No

Underground utilities? _____ Yes _____ No

Layered soils? _____ Yes _____ No

Layered soil dipping into excavation? _____ Yes _____ No

Excavation exposed to vibrations: _____ Yes _____ No

Crack-like openings or spallings observed? _____ Yes _____ No

Conditions that may create a hazardous atmosphere? _____ Yes _____ No

If yes, identify condition and source: _____

Surface encumbrances: _____ Yes _____ No

Work to be performed near public vehicular traffic? _____ Yes _____ No

Possible confined space exposure? _____ Yes _____ No

MANUAL TEST

Plasticity: _____ Cohesive _____ Non-cohesive

Dry Strength: _____ Granular (crumbles easily) _____ Cohesive (broken with difficulty)

**EHS 6-3 ATTACHMENT B
SOILS ANALYSIS CHECKLIST**

NOTE: *The following unconfined compressive strength tests should be performed on undisturbed soils.*

THUMB TEST (used to estimate unconfined compressive strength of cohesive soil)

Test performed: Yes No

Type A (soil indented by thumb with very great effort)

Type B (soil indented by thumb with some effort)

Type C (soil easily penetrated several inches by thumb with little or no effort). If soil is submerged, seeping water, subjected to surface water, runoff, exposed to wetting.

PENETROMETER OR SHEARVANE (used to estimate unconfined compressive strength of cohesive soils)

Test performed: Yes No

Type A (soil with unconfined compressive strength of 1.5 tsf or greater)

Type B (soil with unconfined compressive strength of 0.5 tsf to 1.5 tsf)

Type C (soil with unconfined compressive strength of 1.5 tsf or less). If soil is submerged, seeping water, subjected to surface water, runoff, exposed to wetting.

WET SHAKING TEST (used to determine percentage of granular and cohesive materials). Compare results to soil textural classification chart to determine soil type.

Test performed Yes No

Type A (clay, silty clay, sandy clay, clay loam, and in some cases silty clay, loam and sandy clay loam)

Type B [angular gravel (similar to crushed rock), silt, silt loam, sandy loam, and in some cases, silty clay loam and sandy clay loam]

Type C (granular soil including gravel, sand and loamy sand)

% granular % cohesive % silt

NOTE: *Type A -- no soil is Type "A" if soil is fissured; subject to vibration; previously disturbed; layered dipping into the excavation on a slope of 4H:1V.*

SOIL CLASSIFICATION

Type A

Type B

Type C

SELECTION OF PROTECTIVE SYSTEM

Sloping, Specify angle:

Timber Shoring

Aluminum Hydraulic Shoring

NOTE: *Although OSHA will accept the above tests in most cases, some states will not. Check your state safety requirements for trenching regulations.*

PP-14 : Substance Abuse Program (Previously Drug and Alcohol Abuse)**Last Revision By: Darlene Mininni on 11/09/2010****Created By: Procedures Temp on 04/22/2009**

Purpose: To define Tetra Tech EC, Inc. and its subsidiaries' policy and procedures regarding drug and alcohol abuse. This procedure fulfills the requirements of FAR 23.5, Drug-Free Workplace and the DOE Workplace Substance Abuse Program, DEAR 970.5204-58.

Version Date: 04/22/2009 - Revised

Original Issue Date: 10/07/97

Category: Company Procedures

Sections: Personnel Practices

Sub Category: Personnel Practices

Document Type: Procedure

Keyword Index: Staffing/Personnel

Document Owner: Jackie Rollins

Approved By:



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2.0 SCOPE

3.0 MAINTENANCE

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1.0 PURPOSE

To define Tetra Tech EC, Inc. [and its subsidiaries](#)' policy and procedures regarding drug and alcohol abuse. This procedure fulfills the requirements of FAR 23.5, Drug-Free Workplace and the DOE Workplace Substance Abuse Program, DEAR 970.5204-58.



2.0 SCOPE

This procedure applies to all employees of TtEC and its subsidiaries.



3.0 MAINTENANCE

The Vice President of Human Resources is responsible for updating this procedure. Approval authority rests with the TtEC [and its subsidiaries](#) President and Chief Executive Officer. Suggestions for revision shall be submitted to both the department responsible for updating the procedure and the [Executive Vice President and Chief Financial Officer](#).



4.0 DEFINITIONS



4.1 Employee

For purposes of this procedure the term “employee” means all full-time and part-time staff, and all job shoppers, temporary agency personnel, subcontractors, vendors, etc., who have access to the Company’s premises to fulfill the requirements of their assignments. (Note: Subcontract and Vendor personnel shall be required to comply with this procedure in the terms of their contract).



4.2 Controlled Substance (Illegal Drug)

Illegal Drug means a controlled substance, as specified in Schedules I through V of the Controlled Substances Act, 21 U.S.C. 811, 812, [and as further defined in regulation at 21 CFR 1308.11-1308.15](#). The term “illegal drugs” does not apply to the use of a controlled substance in accordance with the terms of a valid prescription, or other uses authorized by law. (10 C.F.R. 707.4) Testing as required by this procedure shall at a minimum test for the use of the following classes of drugs: marijuana, cocaine, opiates, phencyclidine, and amphetamines.



4.3 Occurrence

Occurrence means any event or incident that is a deviation from the planned or expected behavior or course of events in connection with any Client, Department of Energy (DOE), or DOE-controlled operation, if the deviation has environmental, public health and safety, or national security protection significance. Incidents having such significance include the following, or incidents of a similar nature:

1. Injury or fatality to any person involving actions of a Company employee.
2. Involvement of nuclear explosives under DOE jurisdiction which results in an explosion, fire, the spread of radioactive material, personal injury or death, or significant damage to property.
3. Accidental release of pollutants which results or could result in a significant effect on the public or environment.
4. Accidental release of radioactive material above regulator limits.



4.4 Reasonable Suspicion

A reasonable suspicion of illegal drug use or alcohol abuse may be based upon the following; or similar circumstances:

- a. Observable phenomena, such as direct observation of the use or possession of illegal drugs; or the physical symptoms of being under the influence of drugs or alcohol;
- b. A pattern of abnormal conduct or erratic behavior;
- c. Arrest for a conviction of a drug related offense, or the identification of an individual as the focus of a criminal investigation into illegal drug possession use, or trafficking;
- d. Information that is either provided by a reliable and credible source or is independently corroborated;
- e. Evidence that an employee tampered with a drug test or the temperature of the urine specimen is outside the range of 32.5 – 37.7 degrees centigrade or 90.5 – 99.8 degrees Fahrenheit.



4.5 Rehabilitation

Rehabilitation means a formal treatment process aimed at the resolution of behavioral-medical problems, including illegal drug use and alcohol abuse, and resulting in such resolution.



5.0 DISCUSSION

5.1 Policy

The unlawful manufacture, distribution, dispensing, possession, sale, or use of an illegal drug is prohibited in the Company's workplace (including company-owned or client provided premises and vehicles). The Company is committed to maintaining a workplace free of substance abuse and illegal drugs. As a condition of employment, or as a condition to gain access onto Company work premises, all employees are required to consent to alcohol and/or drug screening as covered in this procedure. Compliance with this procedure by vendor and subcontractor personnel shall be required by the terms of their subcontract with the Company. Any employee found to be in violation of this procedure is subject to disciplinary action, up to and including termination.

5.2 Responsibilities

5.2.1 All Employees

All employees are responsible for each of the following:

- a) Abiding by the terms of this procedure as a condition of employment. Applicants are required to execute the Company form authorizing illegal drug testing (see Attachment 1). In unusual and compelling circumstances where an applicant commences employment before the results of the drug test are available, the applicant is required to execute a Pre-Employment Test Agreement (see Attachment 2). Failure to execute these required forms, when applicable, shall cause the applicant to be ineligible for employment with the Company; and
- b) Reporting to their supervisor the use of prescription drugs which may impair or affect the employees' alertness, coordination, or ability to perform their jobs properly and safely; and
- c) Reporting any suspected or actual violations of this procedure to their supervisor, other management personnel, the Human Resources department, or the Compliance Hot Line at 1-800-886-2577. (See Company Procedure PP-18, Compliance Hot Line, for more information.)
- d) Notifying the Company in writing within five days of being convicted of a violation of a criminal drug statute for a violation occurring in the work-place.

5.2.2 Supervisors and Line Managers

Supervisors and Line Managers are required to:

- a) Notify promptly the Human Resources department and local law enforcement authorities in the event substances are found which are believed to be illegal drugs; and
- b) Notify the Administration and Compliance department of any notice of conviction reported by employees as required by this procedure and coordinate with the Administration and Compliance department to provide the required notice to the appropriate federal government Contracting Officer and/or Security Officer within 10 days of receiving such written notice from the employee; and
- c) Complete Company-provided training to enable the supervisor to recognize deteriorating job performance or judgment, or unusual conduct, which may be the result of possible illegal drug use; and
- d) Intervene when there is deterioration in performance, or observed unusual conduct in an employee under their supervision. In conjunction with the Human Resources department as appropriate, supervisors may offer alternative courses of action that can assist the employee in returning to satisfactory performance, judgment, or conduct, including referral to outside agencies as appropriate. (Note that nothing in this procedure obligates the Company or any client to pay the costs of nor to offer any individual counseling, rehabilitation, or treatment.) Supervisors shall coordinate all such referrals through the internal Employee Assistance Program implemented by the Human Resources department and shall take appropriate measures to protect the privacy of employees.

5.2.3 Human Resources Department

The Human Resources department has the following responsibilities:

- a) Training Program – The Human Resources department shall provide training to supervisors and

communication to employees regarding the problems of substance abuse, including illegal drug use, the availability of referrals to other resources for assistance, and the penalties that may be imposed upon employees for drug-related violations and/or violation of this procedure. Such training shall emphasize preventive measures.

- b) As part of the training program, ensure that all new employees, including craft employees, are provided a copy of this procedure. (Note the DOE requires the notice to contain essentially everything in this procedure)
- c) Pre-employment Screening – The Human Resources department shall implement and maintain a program to ensure pre-employment drug screening in accordance with this procedure of all applicants. (required for DOE contracts – designated positions)
- d) Random or Occurrence Based Drug Testing – The Human Resources department shall initiate random drug testing or for cause testing (i.e., occurrence based or suspicion based) when required to comply with DOE regulations, this procedure, and/or as otherwise deemed necessary by Executive Management.
- e) Employee Assistance Program – Tetra Tech offers all employees the opportunity to utilize services provided through our EAP. A description of services is described in our benefits material. The number to contact our EAP service is 800-662-7241.
- f) Employee Privacy – In implementing the above programs, the Human Resources department shall take appropriate measures to protect the privacy interests of employees and applicants.
- g) Applicant Documentation – The Human Resources department is responsible for ensuring that the applicable pre-employment forms (Attachments 1 & 2) are executed by the employee before employment commences and are maintained in the employees permanent employment file.
- h) Contract for Testing Services – The Human Resources department (using the Company's procurement department and by completing a Purchase Requisition and Scope of Work) is responsible for obtaining contracts with responsible testing services and ensuring that contract terms comply with the requirements of this procedure and 10 CFR §§ 707.12 & 707.13. The Human Resources department has the ongoing responsibility for managing the contract.

5.2.4 Procurement Department

The Procurement department is responsible for:

- a) Ensuring that all subcontracts and purchase orders contain the appropriate prime contract flow-down requirements related to drug-free workplace requirements; and
- b) Obtaining the appropriate vendor's drug-free workplace programs and providing copies to the Health and Safety department to initiate compliance reviews where such a plan is required by the subcontract terms; and
- c) Supporting the Human Resources department by contracting for testing services in accordance with the approved Purchase Requisition and Scope of Work. The Procurement department has the ongoing responsibility for administration of such a contract.

5.2.5 ESQ Department

- a) The ESQ Department is responsible for conducting inspections of Subcontractor's programs and implementation thereof to ensure compliance with contract flow-down requirements.
- b) The ESQ Department may also initiate for-cause testing.

5.2.6 Administration and Compliance Department

The Administration and Compliance Department is responsible for:

- a) Conducting periodic internal audits of the Company Substance Abuse Program to ensure compliance with this procedure, contract requirements, and the applicable federal regulations; and

- b) Reviewing all written notices of convictions by employees provided in accordance with this procedure and coordinate with the Program Manager to ensure timely notice (within 10 days) to the appropriate federal government Contracting Officer or Security Officer. In addition, take any steps necessary to suspend an employee's security clearance as required by the applicable federal regulations; and
- c) Assisting PMs with all federal government security requirements as detailed in this procedure.

5.3 Substance Abuse Screening

5.3.1 Pre-employment Screening

All prospective employees, typically after receiving an offer, are subject to drug testing for substance abuse in accordance with this procedure. Testing will be at Company expense. Any prospective employee who refuses to submit to the test, or has positive test results will have the offer revoked.

5.3.2 Reasonable Suspicion or Occurrence Related Screening

As a condition of employment all employees are subject to Company paid drug and/or alcohol tests at anytime the Company has a reasonable suspicion that an employee is using illegal drugs or abusing alcohol; or that an employee could have caused or contributed to an occurrence. In addition to the events or incidences listed in paragraph 4.3, Occurrences, of this procedure, reasonable suspicion may be inferred from an employee's involvement in the following:

1. an incident that results in damage or loss in excess of \$5000 to equipment, vehicles, or property, or
2. a near miss, that under different circumstances, could have resulted in an incident such as those listed herein.

Refusal to take a drug test is cause for disciplinary action up to and including termination of employment.

Positive test results are cause for disciplinary action up to and including termination of employment.

5.3.3 Random Sampling

This procedure provides notice that the Company may at any time without further notice initiate random drug and/or alcohol screening, on a company-wide, project by project, or site specific basis. (See Attachment 3 for DOE contract requirements).

5.3.4 Positive Test Results

- a) When an applicant for employment has been tested and determined to have used an illegal drug, processing for employment will be terminated and the applicant will be so notified.
- b) When an employee has been tested and determined to have used an illegal drug, the employee will be removed from any testing designated position (see Attachment 3) and proper notice shall be provided to government security officials consistent with this procedure. The employee's supervisor and the Vice President of Human Resources shall determine the appropriate disciplinary action consistent with this procedure.

5.3.5 Additional Requirements for RMA

All personnel performing work under the Rocky Mountain Arsenal (RMA) Program Management Contract (PMC) are required to adhere to the requirements set forth in Company Procedure PP-14, Substance Abuse Program and the Rocky Mountain Arsenal PMC Project Rules Handbook. Additionally, in reference to PP-14, Section 5.3.4, letter b), Positive Test Results, "The employee's supervisor..." is understood to be the PMC Program Manager or designee at RMA. This is an addendum to PP-14.

5.4 Collective Bargaining

The requirements of this procedure shall be included in the negotiation of any collective bargaining

agreements. For work on DOE sites, the requirements of the client approved project Substance Abuse Program must not be altered.

5.5 Employee Awareness Program

Employees and supervisors shall receive drug and alcohol abuse awareness training or communication as described herein.

Employees interested in counseling or in seeking rehabilitation may contact the Human Resources department for a confidential referral to available assistance programs.

Nothing in this procedure is intended to establish an obligation for the Company and/or its clients to rehabilitate employees who use illegal drugs or alcohol. Employees found to be in violation of this procedure are subject to disciplinary action up to and including termination notwithstanding any rehabilitation measures undertaken except, if such employee is deemed to be rehabilitated by the Company provided medical authority and remains free from illegal drug or alcohol use. Rehabilitated employees who engage in the use of illegal drugs, controlled substances, or alcohol are no longer deemed to be rehabilitated for the purposes of this procedure.

5.6 Off-the-job Drug or Alcohol Abuse

Off-the-job drug or alcohol abuse which makes an employee unfit for work, or which has a potential for adversely affecting the employee's job performance, or jeopardizing the safety of persons or property, or causing embarrassment or discredit to the Company, can be cause for disciplinary action.

5.7 Records and Sample Management

All laboratory records relating to positive drug test results, including initial test records and chromatographic tracings, shall be retained by the laboratory in such a manner as to allow retrieval of all information pertaining to the individual urine specimens for a minimum period of five years after completion of testing of any given specimen. In addition, the laboratory shall retain a frozen sample of all positive urine specimens for at least six months.

The testing service shall also maintain as part of its record, copies of all specimen chain of custody forms, which shall contain the following information:

- a. Date of collection;
- b. Tested person's name and social security number;
- c. Specimen number;
- d. Type of test (random, applicant, occurrence, reasonable suspicion, follow-up, or other);
- e. Temperature range of specimen;
- f. Remarks regarding unusual behavior or conditions;
- g. Collector's signature; and
- h. Certification signature of specimen provider certifying that specimen identified is in fact the specimen the individual provided.

All pre-employment forms shall be maintained in the employee's permanent employee file. (See Attachments 1 & 2 for these forms.)

5.8 Testing Services

Only testing laboratories that are certified by the Department of Health and Human Services, under subpart C of the HHS Mandatory Guidelines are to be utilized. In addition, the contract with the testing services shall include records and sample management requirements in accordance with this procedure (see also [69 FR 19644](#), April 13, 2004).

5.9 Project Specific Workplace Substance Abuse Plans

This procedure (*excluding* Attachment 3) constitutes the Company's Workplace Substance Abuse Plan for all contracts other than for DOE and DOT Pipeline projects and shall be submitted to the client for approval as required by the contract terms. For DOE projects, this procedure, *including* Attachment 3, constitutes the Project specific Workplace Substance Abuse Plan. For DOT Pipeline projects, this procedure must be supplemented with the latest version of DOT 49 CFR 199 and facility operator specifics to constitute the project-specific Workplace Substance Abuse Plan. PMs may issue project specific procedures if contract requirements differ significantly from those herein. (See company procedure PP-25, Procedures - Authorization, Preparation and Distribution, for project procedure requirements.)

5.10 Personnel Practices Manual Application

The **Personnel Practices** have been developed to assist you in the day-to-day management of your employees.

These personnel practices are designed to provide fair and equitable treatment of all employees, as well as to protect the interests of the Company.

These practices are not an employment contract between the Company and any of its employees, nor are they a legal document. They are for descriptive purposes only. The purpose is to provide you with guidance on the administration of various personnel practices.

The Company, at its discretion, may change any of these practices without prior notice. It is also management's prerogative to authorize exceptions to these practices in individual situations. The cognizant Vice President and the Vice President of Human Resources must approve of all exceptions to this Manual. The Quality Rule does not apply to procedures outlined in the Personnel Practices Manual.

Members of the Human Resources department are available to help you interpret and administer these practices.

6.0 REFERENCES

Please Describe Your Reference Here	Place Your Link in this Column
1. Personnel Practices Procedure PP-18, Employee Reporting, Hotline, and Non-Retaliation	
2. PR-1 - Procedures - Authorization, Preparation, and Distribution	
3.	

7.0 ATTACHMENTS

Please Provide a Description of the Attachment	Place Your Attachments Here
1. Attachment 1 - Form for Permission to be Drug Tested	 PP14at1.doc
2. Attachment 2 - Pre-Employment "Test" Agreement	See Below
3. Attachment 3 - Additional Requirements for DOE Prime Contracts and Subcontracts	See Below

ATTACHMENT 2
Tetra Tech EC, Inc. [and its subsidiaries](#)
PRE-EMPLOYMENT "TEST" AGREEMENT

The Company recognizes that the pre-employment contingencies that are related to drug tests and or physical tests have not been met, however, I will be scheduled in the very near future for these tests. I understand that my employment will be terminated in the event these tests are not successfully completed.

Click the icon below to launch or download.



PP14at2.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.



ATTACHMENT 3
Tetra Tech EC, Inc. [and its subsidiaries](#)
ADDITIONAL REQUIREMENTS FOR DOE PRIME CONTRACTS AND SUBCONTRACTS

I. Identification of Designated Positions

For DOE client contracts (where the Company is the prime contractor or the subcontractor), the Program Manager (PM) in coordination with the Administration and Compliance department (i.e., the Company Facility Security Officer (FSO), see Project Initiation/Operations PO-13, Government Security) shall identify the positions designated for drug testing in accordance with 10 CFR 707.7 (b), 10 CFR 710, and paragraph IV below.

- i. The PM shall notify the DOE Contracting Officer and the Human Resources department of the designated positions identified in accordance with item I above.
- ii. The FSO shall maintain a list of all designated positions on all DOE contracts.

II. Responsibilities of Employees in Designated Positions

- a. Individuals in designated positions who are not free from the use of illegal drugs are prohibited from working in a designated position.
- b. Individuals in designated positions who are found to be in violation of this procedure (including this Attachment 3) are subject to disciplinary action in accordance with this procedure.
- c. Employees in a designated position must notify their supervisor in writing of any drug-related arrest or conviction, or receipt of a positive drug test result as soon as possible but within 10 calendar days of such arrest, conviction, or receipt.
 - i. Immediately upon receipt of such notification, supervisor's must notify the PM, the FSO, and the Human Resources department.
 - ii. The FSO shall coordinate with the PM ensure appropriate notice to the DOE security officer and the Contracting Officer.
 - iii. Upon such notice the employee shall be removed from duty in a designated position and is subject to disciplinary action up to and including termination of employment.
 - iv. Employees failing to provide the required notice shall have their employment with the Company terminated immediately upon the Company learning of such failure. (not required by the regulations).

III. Permitted Screening

All applicants and employees are subject to pre-employment drug screening, testing on the basis of

reasonable suspicion, as a result of an occurrence, or as a follow-up to rehabilitation, and random urine drug testing at any time during the course of their employment in accordance with this procedure.

a. 100% of employees in PSAP or PAP designated positions and 50% of employees in positions which could significantly harm the environment, public health or safety, or national security (e.g., personnel directly engaged in production, use, storage transportation, or disposal of hazardous materials sufficient to cause significant harm to the environment or public health and safety, individuals with unescorted access to control areas of certain DOE reactors (see 10 CFR 707.7), and other positions as determined by DOE to have the potential to significantly affect the environment, public health and safety, or national security) will undergo such testing at least once every 12 months.

b. Employees who could have caused or contributed to an occurrence, requiring *immediate* notification or reporting to DOE, shall be tested as soon as possible after the occurrence, but within 24 hours of the occurrence. When the contract terms, DOE Orders or the applicable rules and regulations do not require immediate notification of the occurrence, such potentially involved employees may be tested as deemed appropriate by the Company.

IV. Rehabilitated Employees

While it is not the policy of the Company to offer employees rehabilitation, if an employee tests positive and is rehabilitated, the employee may not return to work at a DOE location unless the requirements of 10 CFR 707.14, Action Pursuant to a Determination of Illegal Drug Use, are met.

VI. PM Communication

a. The PM is responsible for coordinating, as described in this procedure, with the appropriate company officials such as the Human Resources department and the Administration and Compliance department to ensure that DOE is kept fully apprised of all aspects of the Substance Abuse Program.

b. The PM shall notify and coordinate with the Administration and Compliance department regarding any audit initiated by the client regarding this procedure or the implementation of this program on the contract.

VII. Applicability to Subcontracts

The PM submit all subcontracts believed to require a Substance Abuse Plan to the DOE Contracting Officer for determination as to whether the requirement applies.

VIII. Project Workplace Substance Abuse Plan

This procedure (including this Attachment 3) constitutes the Company's Workplace Substance Abuse Plan for DOE contracts and shall be submitted to the DOE Contracting Officer, or Prime Contractor, for approval as required by the contract terms. PMs may issue project specific procedures if contract requirements differ from those herein. (See company procedure PP-25, Procedures - Authorization, Preparation and Distribution, for project procedure requirements.) Any changes to this procedure shall be submitted to the DOE Contracting Officer for approval at least 30 days prior to implementation on DOE contracts requiring a Workplace Substance Abuse Plan.

IX. DOE Project Employee Positive Test Results

c) An individual who has been notified of a positive test result may request a retest of the *same* sample at the same or another certified laboratory. The individual shall bear the costs of transportation and/or testing of the specimen. (Required by DOE)

d) Confirmed positive test results shall be provided to the DOE Medical Review Officer and other Company and DOE officials with a need to know. Any other disclosure may only be made with the written consent of the individual.

X. DOE Designated Positions

Positions requiring 100% Annual Random Drug Testing:

1. Personnel Security Assurance Program (PSAP) positions:
Positions that afford direct access to Category I quantities of Special Nuclear Material (SNM) or have direct responsibility for transportation or protection of Category I quantities of SNM¹.
Positions that afford direct access to the control areas of a nuclear material production reactor.
Positions with the potential for causing unacceptable damage² Unacceptable damage means an incident that could result in a nuclear explosive detonation, a major environmental release from a nuclear material production reactor, or an interruption of nuclear weapons productions with a significant impact on national security. to national security.
2. Personnel Assurance Program (PAP) Positions:
Positions which entail critical duties that require an employee to perform work which affords both technical knowledge of and access to nuclear explosives sufficient to enable the individual to cause detonation (high explosive or nuclear).
3. Any individual, whether or not a company employee, who is allowed unescorted access to the control areas of the following DOE reactors:
Advanced Test Reactors (ATR);
C Production Reactors (C);
Experimental Breeder Reactor II (EBR-II);
Fast Flux Test Facility (FFTF);
High Flux Beam Reactor (HFBR);
High Flux Isotope Reactor (HFIR);
K Production Reactor (K);
L Production Reactor (L);
N Production Reactor (N);
Oak Ridge Research Reactor (ORR); and
P Production Reactor (P).

Positions requiring 50% Annual Random Drug Testing:

1. Positions which entail duties where the failure of an employee adequately to discharge his or her position could significantly harm the environment, public health or safety, or national security such as:
Pilots;
Firefighters;
Protective force personnel in positions involving use of firearms where the duties also require potential contact with, or proximity to, the public at large;
Personnel directly engaged in construction, maintenance, or operation of nuclear reactors; or
hazardous material sufficient to cause significant harm to the environment or public health and safety.

¹ (SNM means plutonium, uranium enriched in isotope 233, or in isotope 235, and any other material which pursuant to the provisions Section 51 of the Atomic Energy Act of 1954, as amended, has determined to be SNM, but does not include source material; or any material artificially enriched by any of the foregoing, not including source material.

² Unacceptable damage means an incident that could result in a nuclear explosive detonation, a major environmental release from a nuclear material production reactor, or an interruption of nuclear weapons productions with a significant impact on national security.

Tetra Tech EC, Inc.

NOTICE OF OWNERSHIP AND CONDITIONS OF USE

This document is the property of Tetra Tech EC, Inc. (TtEC) and is to be used only for the duration and connection with the performance of work for TtEC. Written deviations to this document may be authorized when

appropriate in accordance with the Quality Rule. This document is not to be construed as an employment contract or any binding obligation of TtEC. This document may be modified or rescinded at any time with or without prior notice at the sole discretion of TtEC. Hard copies of this document may not contain the most current information. The current version of this document can be found on the TtEC online Corporate Reference Library.

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Tetra Tech EC, Inc.

Proprietary Information



FORM FOR PERMISSION TO BE DRUG TESTED

Dear Applicant:

Please read the following carefully; it contains information you should be aware of before accepting employment with Tetra Tech EC, Inc. or any of its subsidiaries (the "Company").

DRUG FREE WORKPLACE

The safety and well being of all employees is of prime importance to the Company. Providing a workplace that is free from the hazards of substance abuse is one method of protecting our most important asset—YOU.

The Company has always strictly prohibited the illegal use, distribution or possession of drugs or the unauthorized use of alcoholic beverages on Company premises. We are committed to maintaining a drug-free workplace. Your support is essential. Copies of our policy have been distributed to all employees and are available for review in the on-line Lotus Notes Corporate Reference Library or from the Human Resources Department.

Our Company policy requires all prospective employees to take and pass a drug-screening test. Your employment with the Company is contingent upon you passing this test, i.e., obtaining a negative result.

Please note that at the time of the test you MUST put down on the medical history form all medications or drugs you have taken in the past 30 days. It might be helpful for you to make a list of all prescription, non-prescription, and over-the-counter pills, liquids and injections you have taken in the last 30 days, and bring this list with you to the drug-screening test. If your test results are positive for any substances not listed on this form, you will be deemed to have failed the Company's drug screening, and your conditional offer of employment will be withdrawn. If, for whatever reason, you have begun employment prior to the availability of the results of the screening and the laboratory issues a positive result, you will no longer be eligible to continue employment and will be terminated.

As a condition of employment, all Company employees must abide by the terms of Company Procedure PP-14, Substance Abuse Program.

REPORTS OF DoD AND DEFENSE-RELATED EMPLOYMENT

The Department of Defense (DoD) requires that certain individuals who are employed by a defense contractor, such as the Company, file a special form with the Government. You may be required to file if you have had previous employment with a DoD component, are a retired or former military or civilian officer, earn at least \$25,000 a year, and meet one or two other criteria.

Any qualifying individual who knowingly fails to file the form, or who falsifies any required information, may be subject to an administrative penalty of up to \$10,000. Willful falsification of information may also further result in criminal prosecution.

If you have specific questions about your particular situation and the form's applicability to you, please direct them to the Government Contract Compliance Department, Morris Plains, New Jersey.

If you feel you may be required to file pursuant to 10 U.S.C.2397C, please review this with your Human Resources Representative during orientation. Forms are available in the Human Resources Department.

EMPLOYMENT ELIGIBILITY

TtEC will comply with the Immigration Reform and Control Act of 1986. All offers are contingent upon the applicant's ability to provide proof of eligibility to work in the United States. On the first day of employment, you must be prepared to present documents to verify that eligibility. Your Human Resources Representative has a list of acceptable documents that can be used for verification. Please check with your Human Resources Representative if you have questions.

An Equal Employment Opportunity Employer



FORM FOR PERMISSION TO BE DRUG TESTED

By signing below, I acknowledge that I have read and understand all that has been written above.

Sign: _____ Date: _____

An Equal Employment Opportunity Employer



TETRA TECH EC, INCORPORATED

DATE: _____

TO: _____
Applicant's Name

FROM: Tetra Tech EC, Inc.

SUBJECT: **Tetra Tech's Drug Screening Test**

Dear Applicant:

This is to notify you that Tetra Tech EC, Incorporated has a company policy requiring all prospective employees to take and pass a drug screening test. Your employment with Tetra Tech is contingent upon your passing this test, i.e. obtaining a negative test result.

Please note that at the time of the test you MUST list on the medical history form all medications or drugs you have taken in the past 30 days. It might be helpful for you to make a list beforehand of all prescription, non-prescription, and over-the-counter pills, liquids, and injections that you have taken in the last 30 days, and to bring this list with you to the drug screening test. If your results are positive for any substances not listed on this form, you will be deemed to have failed Tetra Tech's drug screening, and your conditional offer of employment will be withdrawn.

By signing below, I acknowledge that I have read and understood all that has been written above.

(Applicant's Signature)

(Date)

Attachment D

Resumes

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Experience Summary

Mr. Margotto has over thirty years of leadership experience as a manager of health, safety and technical programs. He has also served in progressive leadership positions as an Air Force officer. He has experience in all phases of organizing, managing, and decision-making; training and supervising personnel; conducting quality assurance assessments; preparing budgets; writing, public speaking and teaching. Mr. Margotto also possesses an extensive working knowledge of EPA, OSHA, and DOT regulations, with an emphasis on regulations relating to safety, hazardous waste management and hazardous materials transportation.

Education

BA (Bachelor of Arts), Chemistry, College of St. Thomas, 1969

Registrations/Certifications

Certified Industrial Hygienist, ABIH, Number 5571, Earned 7/15/92

Certified Safety Professional, Number 11894, Earned 8/1/93

Certified Hazardous Materials Manager, Number 2005, Earned 9/1/89

Training

40-Hour OSHA Hazardous Waste Training

8-Hour OSHA Hazardous Waste Health and Safety Refresher Training; 2008

Advanced Life Support, CPR, First Aid, Bloodborne Pathogens

Advanced Risk Assessment; 1998

Air Monitoring Training; 1993

Alliance of Hazardous Materials Professionals Conference; 2009

Alliance of Hazardous Materials Professionals Conference

American Industrial Hygiene Conferences

American Industrial Hygiene Conferences; 2008

Asbestos and Lead Based Paint Issues for Certified Industrial Hygienists, University of California, Berkeley

Blood Borne Pathogens; 2008

Building Air Quality; 1998

California Industrial Hygiene Council Conferences; 2007

Chemical Biological and Radiological Warfare Materials

Confined Spaces; 1993

Confined, Space Safety, Lock Out/Tag Out, Excavations, Fall Protection, Scaffolds, Welding/hot work

Data Quality Objectives; 1999

Ergonomic Assessment; 1999

Ergonomics

Handling Naturally Occurring Radioactive Material; 2000

Hazardous Waste and Emergency Response Training (40-hr and 8-hr refresher training) since 1986

Indoor Air Quality, Mold assessment

Lead Based Paint Issues for Certified Industrial Hygienists; 2002

Loss Control Management

Loss Control Management; 1998

Medical Technology

Nanotechnology Safety

National Defense University- National Security Management

NIOSH 550 Industrial Hygiene Measurements; 1987

NIOSH 550: Industrial Hygiene Measurements
NIOSH 551 Industrial Hygiene and Engineering; 1988
NIOSH 551: Industrial Hygiene and Engineering
Occupational Ergonomics; 1994
OSHA 500: Trainer Course in Occupation Safety and Health for the Construction Industry
OSHA 500: Trainer Course in Occupational Safety and Health for the Construction Industry; 2004
Process Safety Management
Process Safety Management; 1993
Professional Industrial Hygiene conference; 2006
Professional Industrial Hygiene Conferences
Radiation Safety; 1997
Radioactive materials and radiation safety, Ionizing and non-ionizing radiation
Respiratory Protection Programs
Respiratory Protection Programs; 3M; 2004
Site Safety Supervisor Training; 1991
Southern California AIHA/ASSE Safety Conferences
Squadron Officers School, Air Command and Staff College, Air War College
Understanding Worker's Compensation
Welding Safety; 1993

Corporation Project Experience

Supervising Health & Safety Scientist, 1998 – Present

San Diego, CA

Responsible for managing environmental health and safety for remediation services contracts with the U.S. Navy and the United States Army Corps of Engineers. Serves as a Certified Industrial Hygienist for the Southwest Division Remedial Activities Contract, Naval Facilities Engineering Command. CIH for contracts with the United States Fish and Wildlife Service, the National Park Service, and the Air Force Center for Environmental Excellence. Writes site-specific health and safety plans. Was also responsible for reviewing activities, plans and data for a variety of field projects including two Superfund sites, the former Long Beach Naval Station, the San Diego Naval Station, the Miramar Marine Corps Air Station, the Kirtland Air Force Base, and the Holloman Air Force Base in New Mexico. Provided plans, guidance and safety oversight to a major project at the former Hunters Point Naval Shipyard in San Francisco and the former Naval Air Station Alameda. Provided special support to projects at the Rocky Flats Environmental Technology Site (DOE). Previously evaluated and prepared health and safety plans for a rapid response remediation project of almost 800,000 gallons of stored waste oil and hazardous waste. Developed plans for a major commercial site at a former landfill in Los Angeles County involving deep dynamic compaction and installing piling into a landfill and a novel gas collection system. Presented testimony to the California Energy Commission in preparation of plans for power plant sites. Developed and managed an air-monitoring program for a demolition project at Naval Weapons Station Seal Beach and a significant safety program for the remediation of one of the largest hangars in the western United States at the former Moffett Field Naval Air Station. Project required use of four cranes with work platforms, thirteen elevating working platforms extending as high as 100 feet. Contamination with asbestos, lead and PCBs required continuous evaluation. Inspected projects in the field to insure compliance with plans, procedures and regulations. Provided consultation services to commercial projects involving property transfers and other safety related matters. Trained personnel in various areas of environmental compliance, safety, and health.

Previous Experience

Certified Industrial Hygienist, 1994 – 1998

OHM Remediation Services Corporation, San Diego, CA

Managed health and safety for major remediation services contract with the U.S. Navy. Wrote site-specific health and safety plans, and integrated health and safety into daily operations at over 12 Navy and marine facilities for more than 100 delivery orders totaling more than \$200 million. Assessed the effectiveness of chemical protective clothing, procedures, and hazard appraisals. Evaluated data and air monitoring from job sites to ensure employee protection and compliance with safe work procedures. Provided training for over 300 employees. Audited field projects to insure compliance with plans, procedures and regulations.

Health and Safety Manager, 1991 – 1994

Chemical Waste Management, Inc., Kettleman City, CA

Managed health and safety at a major hazardous waste TSDF. Implemented and directed a health and safety program for over 200 employees. Assessed operations involving landfilling, stabilization of hazardous waste, storage of over 1,000 drums, management of PCBs, and other special projects. Taught OSHA HAZWOPER required 40-hour course, 8-hour supervisor course, and annual refresher courses. Trained personnel in operational procedures such as confined space entry. Managed the facility emergency response team.

Partner/Technical Health and Safety Manager, 1989 – 1990

Archon Services, Inc., Memphis, TN

Wrote health and safety plans and implemented them in field operations. Performed work in the field, monitoring for exposure levels and to insure that work was performed safely. Participated in a high hazard project with inhibited red fuming nitric acid (IRFNA) and unsymmetrical dimethylhydrazine (UDMH) for the U.S. Navy. Evaluated sites for environmental contamination and performed site assessments. Managed PCB remediation projects for Arkansas Power and Light. Managed the company health and safety program and provided training and consulting services. Wrote health and safety plans and QA/QC and environmental management plans for an ACOE project in Indiana.

Health & Safety Technical Coordinator, 1986 – 1989

Chemical Waste Management, Inc., San Antonio, TX, Memphis, TN, and Atlanta, GA

Developed and managed a health and safety program for 120 employees. Organized and developed an 86-hour training program. Trained over 300 people in hazardous waste operations. Wrote a health and safety plan for a major project at Pine Bluff Army Arsenal and provided site supervision for the construction of two landfills involving contaminated soils, chemical warfare agents and decommissioning by-products. Participated in projects involving PCBs, pentachlorophenol, IRFNA, anhydrous hydrazine, UDMH, white phosphorous and other chemicals at the Redstone Army Arsenal and Marshall Space Flight Center. Provided health and safety training and oversight to two Superfund projects. Managed the removal of hazardous waste for a DRMO project at Kelly AFB, Texas and other Air Force, Navy and Coast Guard Facilities throughout Texas..

Biomedical Scientist (Officer 04), 1971 – 1985

U.S. Air Force, United States and Europe

Managed Air Force clinical laboratories. Developed and performed laboratory tests to treat military members and eligible dependents. Served as laboratory manager, clinical pathology manager, radiation safety officer, and base drug testing program monitor. Managed a staff of laboratory technologists, technicians and officers. Served on the hospital radiation safety committee and infection control committees. Developed original analytical procedures for the urine analysis of abusive drugs and



managed the USAFE Drug Abuse Detection Laboratory in Wiesbaden, Germany. Awarded Meritorious Service Medal and 3 Air Force Commendation Medals

Professional Affiliations

Member, Alliance of Hazardous Materials Professionals

Member, American Chemical Society

Diplomate, American Industrial Hygiene Association



Employment Status

- SES Role: Program Manager
- Employed with SES since September 2007

Professional Licenses, Registrations, and Training

- USEPA/OSHA – required 40 Hour Hazardous Waste Site/Emergency Response Health and Safety Training w/ annual refreshers through 2011.
- USEPA/OSHA – certified Hazardous Waste Site/Emergency Response Manager’s Course

Years Experience

30 years total
4 years with SES

Education

B.A. Geography/Environmental Science, McGill University, Montreal, Canada – 1976.

Experience with Other Firms

- Senior Environmental Scientist, SKM 2006-2007
- Technology representative, Olympic Environmental Equip. 2004-2006
- Owner/Manager, First Star, Inc 2000-2004
- VP Environmental Service, EcoChem 1989-1999
- Environmental Scientist, Sound Environmental Associates 1986-1989 & SCS Engineers 1979-1986

Overview

Mr. McCormick has 30 years experience as a Manager and Consulting Environmental Scientist. He has conducted, managed, and directed numerous aspects and phases of large environmental investigation and restoration programs for government and private entities in the USA and in Australia. His technical expertise in these programs covers contamination source identification; site investigation and characterization; fate and transport evaluation; risk assessment; and remedial action selection, implementation, oversight, and compliance monitoring.

Relevant Project Experience

LONG -TERM MONITORING AND OPERATIONS, DESIGN AND IMPLEMENTATION OF REMEDIAL ACTIONS

Sealaska Environmental Services (SES), Poulsbo, WA

Program Manager

October/2007 to Current

As the Sealaska Environmental Services (SES) Program Manager for the U.S. Navy’s Northwest Facilities Engineering Command Long-Term Monitoring and Operations and Maintenance contract, Mr. McCormick directs all aspects of the program, starting in 2007 for the final two years of a five year \$20M IDIQ Contract, and continuing with a successor five year \$40 M IDIQ Contract. Mr. McCormick is responsible for maintaining and developing client communications and relations; overseeing the Contract Task Order (CTO) proposal, negotiation, and award process; managing staffing resources and project performance; monitoring and ensuring program financial performance; and facilitating effective implementation of the SES quality and safety programs. Under the two contracts, 94 separate CTOs have been conducted/ awarded to date.

CONTAMINATION SAMPLING, SITE ASSESSMENT, CONTAMINATION REMOVAL AND DISPOSAL

Seattle City Light

Seattle, WA

Project Director & Senior Scientist (5 year contract)

Mr. McCormick provided contamination sampling and site assessment services for over 150 separate projects at various Seattle City Light facilities. Typical activities included conducting sampling investigations at utility substations, service centers, operations yards, underground storage tank (UST) removal sites, and emergency spill sites, typically for PCB and petroleum contamination. Where needed, organized and managed contamination removal and disposal/treatment. Prepared all relevant and required reports to appropriate regulatory agencies.

U.S. Navy NACIP Program

Western USA

Performed site identification, risk assessment, site ranking, and planning of confirmation sampling investigations of hundreds of potentially contaminated sites at seven Western U.S. Navy bases.



Fields of Special Competence

- Managing environmental remediation and heavy construction projects.
- Site project management
- Remediation planning, remediation, and installation
- Construction management and oversight
- Hazardous and solid waste management
- Managing and supervising government construction projects and personnel

Education

Civil Engineering, 2002

Chemistry and Environmental Law, 1991

Business Management, 1982

Health and Safety Training

- OSHA 30-hour Construction Course
- Competent Person Training
- 10-hour Supervisor Training
- Confined Space Safety Training
- Red Cross Adult First Aid & CPR
- USACE Construction Quality Management for Contractors
- DOE Advanced Energy Codes
- DOE Advanced Lighting Design
- Certified Hazardous Waste Technician
- Certified Asbestos Technician
- UXO Survey Certified
- 40-hour OSHA HAZWOPER, 1985
- 8-hr. OSHA HAZWOPER refresher

Work History

Sealaska 2011-present

W.M. Schlosser Co. 2009-2011

Vanguard Contractors, LLC 2007-2009

Engineering & Environment, Inc. 2006-2007

ESA Environmental Specialist, Inc. 2004-2006

CAPE Environmental Services, 2002-2004

J.A. Jones Management Services Corp. 2001-2002

OHM/The IT Group 1991-2001

JOHN J. DORMI

Project Manager

Mr. Dormi brings over 20 years experience in managing fast-tracked environmental remediation and heavy construction projects. Including site, project management; remediation planning, remediation and installation; construction management and oversight; and hazardous and solid waste management; 10 years experience managing and supervising government construction projects, and personnel. Ten years experience in on-site construction Project Management, QAQC, Health & Safety Inspection and Management.

Notable Projects

Seymour Johnson Air Force Base - Regulated UST Removal/ AST Installation for Refueling Fighter Jets and Government Vehicles

Managed and coordinated the removal of six (6) regulated underground storage tanks (USTs). Managed the installation of one (1) 15,000 GAL AST, one (1) 4,000 gallon AST and one (1) 500 gallon AST. Managed the installation of the fuel distribution system for the F-22 Raptor Fighter Jets and managed the installation of the fuel distribution system for government vehicle. Managed the installation of a tank monitoring system, (Veeder--Root TSL 350) along with the design and installation of new Tank Accessories. Other responsibilities included managing and coordinating regulatory issues, for the UST removal, subcontractors, Contractor Quality Control, and Health & Safety oversight.

Atlantic Division NAVFACENCOM - Dam Neck, VA, Building 469 Repair/ Upgrade Underground Storage Tank

On-Site Project Manager, SSHO for various upgrades and repair to three underground storage tanks. The installation of a tank monitoring system, (Veeder- Root TSL 350). The design and installation of a new Tank Access way Sump. Managed subcontractors and provided On-Site Contractor Quality Control and Health & Safety oversight.

Atlantic Division NAVFACENCOM - Naval Station Roosevelt Roads, Ceiba, PR, SPCC Corrective Actions

On-Site Project Manager, SSHO, and QCO. This project had many different tasks ranging from the installation of nine (9) new Con-vault Aboveground Storage Tanks (ASTs) ranging in size, to the installation of new Veeder- Root Tank Monitoring Systems at 45 Location throughout the base. Managed subcontractors and provided On-Site Contractor Quality Control and Health & Safety oversight.

Norfolk Naval Station, Norfolk, VA – Repair Aircraft Parking Apron and Bulkhead, SP Area

The work included Install 820 feet of composite sheet pile bulkhead in front of an existing bulkhead filling in the space between the old and new sheet pile with lean concrete. Demolish 4000 liner feet of the pile cap along the entire length of the aircraft taxi – way and replace with new a concrete pile cap. Removal of paved apron and replacement with concrete apron, excavation of fill material behind an existing bulkhead, inspection, and repair of tie rods, backfilling of excavated material, jet grouting of a soil-cement curtain wall, installation of subsurface drains, and incidental related work.



EXPERIENCE

W.M. Schlosser Co, VA (2009-2011), Project Manager

HRT-Norfolk Light Rail Station Finishes – Norfolk, VA

This Contract consists of constructing concrete platforms for eleven stations located 7.5 miles starting from the Eastern Virginia Medical Center to Newtown Road. The work includes constructing concrete platforms, installing and furnishing, benches, trashcans, metal handrails, glass paneled patron shelters, metal roofing, metal structures, and installing lighting poles Construction of drainage facilities to interface with facilities. Installation of sediment and erosion control measures and devices. Installation of water, sewer, electric and communication services. Installation of platform shelter and exterior lighting for the station and surrounding area.

Vanguard Contractors, LLC, VA (2007-2009), Project Manager

Norfolk Naval Station, Norfolk, VA – Repair Aircraft Parking Apron and Bulkhead, SP Area

The work included Install 820 feet of composite sheet pile bulkhead in front of an existing bulkhead filling in the space between the old and new sheet pile with lean concrete. Demolish 4000 liner feet of the pile cap along the entire length of the aircraft taxi – way and replace with new a concrete pile cap. Removal of paved apron and replacement with concrete apron, excavation of fill material behind an existing bulkhead, inspection, and repair of tie rods, backfilling of excavated material, jet grouting of a soil-cement curtain wall, installation of subsurface drains, and incidental related work.

P-699 Aircraft Maintenance Hanger Norfolk Naval Station, Norfolk, VA – Aircraft Maintenance Hanger (MH-60 CV)

Managed a design Build project of two-module, Type I hangar for MH-60s helicopters. Demolish and install a concrete apron.

Engineering & Environment, Inc. (2006-2007), Project Manager

Seymour Johnson Air Force Base - Regulated UST Removal/ AST Installation for Refueling Fighter Jets and Government Vehicles

Managed and coordinated the removal of six (6) regulated underground storage tanks (USTs). Managed the installation of one (1) 15,000 GAL AST, one (1) 4,000 gallon AST and one (1) 500 gallon AST. Managed the installation of the fuel distribution system for the F-22 Raptor Fighter Jets and managed the installation of the fuel distribution system for government vehicle. Managed the installation of a tank monitoring system, (Veeder-- Root TSL 350) along with the design and installation of new Tank Accessories. Other responsibilities included managing and coordinating regulatory issues, for the UST removal, subcontractors, Contractor Quality Control, and Health & Safety oversight.

ESA Environmental Specialists, Inc. (2004-2006), Project Manager

Veterans Administration - Florence National Cemetery Gravesite Expansion - Florence, SC

Managed the Expansion of the Florence National Cemetery Gravesite, managed the construction of new rest facilities, new roadways, storm sewers and floral watering stations. Prepared project specific work plan, quality control plan site-specific health and safety plan. Prepared and submitted all required submittals as per the contract plans and specifications. Prepared all financial documentation as well as preparing and maintaining the construction progress schedule.

Department of Labor – Kittrell Wastewater treatment Plant - Kittrell, NC

Managed and coordinated the regulatory issues, managed and coordinated the I & I study and all costing and construction activities to bring the plant into compliance.

Department of Air Force – Design/Build Renovation to Bldg. 8730 at Eglin Air Force Base - Eglin, FL

Prepared project specific work plan, quality control plan site-specific health and safety plan. Prepared and submitted all required submittals as per the contract plans and specifications. Prepared all financial documentation as well as preparing and maintaining the construction progress schedule. Managed the engineering and design of the mechanical, electrical systems, HVAC ductwork, lightning protection, construction modifications and building structures.

Sothern Division NAVFACENGCOM- Pensacola Naval Air Station - Pensacola, FL

Managed a team of engineers consisting of Civil, Structural, Electrical Mechanical, and Environmental to collect review and analyze of the existing wastewater collection, conveyance, and treatment systems for outstanding repairs that are required to restore Pre-Ivan Conditions. Hardening improvements that were required to improve sustainability and decrease vulnerability to flooding and wind damage of future hurricane or tornado events.

DOAF – Pope Air Force Base, Fayetteville North Carolina, Survey and Repair 28 Hanger Doors & 8 Nose Dock Doors

Prepared project specific work plan, quality control plan site-specific health and safety plan. Prepared and submitted all required submittals as per the contract plans and specifications. Prepared all financial documentation as well as preparing and maintaining the construction progress schedule. Surveyed and repaired 36 Hangar doors and 18 Nose Dock doors, created a maintenance database based on the survey results. The database contains detailed information for maintaining the hangar doors. Inspected and evaluated all electrical, mechanical, safety systems, and components on all the doors. After the survey and database was completed, the repairs were made to all hangar doors. Do to the age of the buildings most of the parts were unavailable and had to be field manufactured. The parts that were made on-site where: wheels, axels, bearings, and tracks.

CAPE, Norfolk, VA (2002-2004), Project Manager

Atlantic Division NAVFACENGCOM – Norfolk Naval Station, Norfolk VA, Build E-13, Historical Train Station Restoration, and conversion to a CPO (chief petty officer) Club

Prepared project specific work plan, quality control plan site-specific health and safety plan. Prepared and submitted all required signals as per the contract plans and specifications. Prepared all financial documentation as well as preparing and maintaining the construction progress schedule. Managed the removal of ACM (asbestos containing material), and the removal of lead based paint. Conducted on-site progress meetings with the government and attended all government-required meetings. Interfaced with Navy contract officer throughout the project to maintain open communication regarding all necessary contractual requirements. Managed the demolition subcontractors and the construction of the CPO club and Restaurant.

Atlantic Division NAVFACENGCOM - Dam Neck, VA, Building 469 Repair/Upgrade Underground Storage Tank

On-Site Project Manager, SSHO for various upgrades and repair to three underground storage tanks. The installation of a tank monitoring system, (Veeder- Root TSL 350). The design and installation of a new Tank Access way Sump. Managed subcontractors and provided On-Site Contractor Quality Control and Health & Safety oversight.

Atlantic Division NAVFACENGCOM - Naval Station Roosevelt Roads, Ceiba, PR, SPCC Corrective Actions

On-Site Project Manager, SSHO, and QCO. This project had many different tasks ranging from the installation of nine (9) new Con-vault Aboveground Storage Tanks (ASTs) ranging in size, to the installation of new Veeder- Root Tank Monitoring Systems at 45 Location throughout the base. Managed subcontractors and provided On-Site Contractor Quality Control and Health & Safety oversight.

Atlantic Division NAVFACENGCOM - OP-1 Viequies Island, Viequies, PR, Tank Closure

Site Superintendent, SSHO, and QCO, The removal for Four Underground Storage Tanks from OP-1 Bombing range. Managed subcontractors and provided On-Site Contractor Quality Control and Health & Safety oversight.

Atlantic Division EFANFACENGCOM - Dover AFB, Dover, DE, RCRA Closure of Hazardous Waste Storage Facility 1306

Site Superintendent, SSHO and QCO, Decontamination of a three Bays at storage facility at Dover AFB. Managed subcontractors and provided On-Site Contractor Quality Control and Health & Safety oversight.

Atlantic Division, LANT NAVFACENGCOM - Asbestos Abatement, Operation Highland Beauty, DTA Harvey Point, NC, Abatement of all Asbestos Siding from a Newly Acquired Building

PM, Site Superintendent, SSHO and QCO, Abatement of Transite Asbestos Siding. Managed subcontractors and provided On-Site Contractor Quality Control and Health & Safety oversight.

Atlantic Division, LANT NAVFACENGCOM - Asbestos Removal at Seven Buildings NSGA Sabana Seca, PR

The Removal of various types of Asbestos from seven buildings, managing subcontractors and providing On-Site Contractor Quality Control and Health & Safety oversight.

OHM/The IT Group (1991-2001), Site Manager/Project Manager

Atlantic Division RAC, New Gosport Landfill - Portsmouth, VA

Site Manager for soil stabilization and excavation of 60,000 tons of lead-contaminated abrasive blast media (ABM) and disposal. Wetland restoration to restore pristine lands suitable for wildlife.

Atlantic Division RAC, Yorktown Naval Weapons, 1999–2000,

Site Manager for construction of a 650- by 50-foot greenhouse over a treatment cell for the biological treatment of 5,000 cubic yards (CY) of trinitrotoluene (TNT) contaminated soils. Construction of a temporary road into tidal wetlands to hold quad-axel trucks to haul soil from the wetlands to the bio-cell.

Atlantic Division RAC, Yorktown Naval Weapons Station, 1998

Site Manager for excavation and disposal of polyaromatic hydrocarbon (PAH) and lead-contaminated soils. Removal of a 5-acre landfill and restoration back to pristine land suitable for wildlife.

Atlantic Division RAC, Q Area, Norfolk Naval Base, 1998

Site Manager for construction of 2 miles of an extensive piping network and the construction of two buildings to house remediation equipment. Installation of three air sparging and vapor extraction systems. The three areas were impacted with dissolved phase 1, 1, 1-trichloroethelene in groundwater.

Atlantic Division RAC, Norfolk Naval Base, 1997-1999

Site Manager for installation of a product recovery system. Four areas were impacted with free product floating on the water table. The product present at Areas A, B, C and Pier 7 was predominately thick, viscous oil called Navy Special Fuel Oil (NFSO). The systems were installed to intercept and recover free-phase petroleum product to mitigate into the nearby Elizabeth River. The systems were designed and constructed with a value engineering approach that will enable subsequent enhancement and/or the addition of more recovery wells in the future. Work performed on time and under budget.

Atlantic Division RAC, Camp Allen Wastewater Treatment Plant, Camp Allen, Norfolk, VA, 1996

Site Manager for installation of several miles of double walled piping and a 75- by 100-foot brick building to house treatment equipment. Construction of a 50- by 30-foot steel building to house a vapor extraction system integrated with the water treatment plant. This water treatment plant designed to treat a maximum 500 gpm.

Atlantic Division RAC, Craney Island Fuel Facility, Portsmouth, VA, 1995

Site Manager for excavation and biological treatment of 80,000 CY of contaminated soil.

Atlantic Division RAC, The Naval Observatory, Washington, DC, 1995-1996.

Site Manager for the removal of a 550-gallon UST contaminated with fuel oil, and the installation of a 500-gallon AST to fuel an emergency generator for Vice President Al Gore. Project performed on schedule.

Atlantic Division RAC, Naval Air Warfare Center in Trenton, NJ, 1994-1995.

Site Manager for the construction of a fully automated water treatment plant to treat more than 2 million gallons of trichloroethene (TCE) contaminated water at 20 gpm.

Pennsylvania Power and Light, York Haven, PA.

Site Manager for the installation and startup of five dual vapor extraction units.

Pennsylvania Department of Environmental Protection.

Site Manager for the installation of a 22-well soil vapor extraction (SVE) system to remove solvents at Pennel Auto Body.

Conrail, Lancaster, PA.

Site Manager. Responsible for the bioremediation of 10,000 CY of soil contaminated with diesel fuel.

Conrail, Meadville, PA.

Site Manager. Responsible for the design and installation of a total fluids recovery system to reclaim product. Project tasks included the installation of six 36- by 25-foot recovery sumps and three 4- by 25-foot product recovery wells. This system was installed to draw down the water table to recover fuel oil from the groundwater and to keep the product from leaking into French Creek.

Economy Color Card, Elizabeth, NJ.

Site Manager. Managed the recovery of TCE and oil in groundwater and soil, and well sampling.

Patterson, NJ.

Site Manager. Managed product recovery and the installation of monitoring wells to perform soil and well sampling.

Chevron USA Fuel Farm, Linden, NJ.

Installation and O&M of four product recovery systems for soil and water sampling. These recovery systems were installed to recover free phase fuel oil from groundwater and to prevent it from leaking into the Raritan River.

Experience Summary

Construction Superintendent/Health and Safety Supervisor with over 16 years of experience in commercial/residential construction and environmental remediation, including landfill construction, shoreline erosion control systems repairs and construction, storm and sewer line system installation and repair, Fuel pipeline and UST decommissioning, environmental cap construction, and product recovery/treatment system operations, maintenance and modification. Significant experience at government sites performing maintenance and operation of groundwater treatment facilities, including installation and maintenance of monitoring wells and monitoring well networks, implementing optimization engineering designs for treatment plants and well networks, and ensuring environmental and permit compliance with treatment facilities. Specific activities have included monitoring systems operating parameters (flow rates, pressures, tank levels, etc.); monitoring treated water totals; collecting treatment plant water samples for field testing and laboratory analysis; inspecting the treatment building, equipment, and safety equipment; tracking lead vessel ordnance loading to determine when to change out GAC; planning and completing GAC change outs; conducting data quality review and tracking analytical laboratory results; maintaining a log of government-owned equipment maintenance, repairs, service, and replacements; and measuring monthly groundwater elevations. Also responsible for submitting weekly Contractor Production Reports and Contractor Quality Control Reports and clearing vegetation encroaching on well locations.

Education

Diploma, High School, 1993

Training

40-hour OSHA Hazardous Waste Operations Training; 2000

8-hour OSHA Hazardous Waste Operations Training Refresher, February 2010; 2010

8-hour OSHA Supervisor Training (1910.120) (e) (4); 2007

Competent Person Training (Trenching and Excavating); 2004

Defensive Driving Course; 2005

DOT/HM-126F Hazmat Training (49 CFR 172 Subpart H); 2009

Environmental Safety Supervisor Training; 2002

Loss Control Self Study Course; 2001

Waste Management Training (40 CFR 265.16); 2009

Corporation Project Experience

Site Superintendent December 2009- Present

U.S. Navy, Shoreline and Landfill repairs, Multiple Sites, Former Naval Air Facility Adak, AK

Supervised 8 craft laborers in the installation and repairs of land use controls at multiple sites throughout the 47,000 acres of developed lands on the remote island of Adak, Alaska. Conducted landfill cap and erosion control installations at two large (>12 acre) landfills and 4 smaller (<2 acre) landfills including swale installations, low permeable cap installation and repairs, and fencing, gate, and sign installations. Conducted significant erosion repairs and erosion control mitigation systems throughout various access road covering 3 miles. Conducted improvements and repairs to existing well monitoring networks associated with the landfills and other listed sites. Work required knowledge of state and federal regulations as well as implementation of a rigorous health and safety program. To date, over **4,800** man-hours of work completed with out a lost time or recordable incident.

Site Superintendent December 2008- 2009

U.S. Navy, Pipeline Decommissioning and Excavation Former Naval Air Facility Adak, AK

Supervised (15) in the decommissioning, cleaning filling, and capping of 46,300 lf of fuel pipeline. Mr. Patterson was responsible for planning and implementing the field program for this large pipeline decommissioning activity at the Former Naval Air Facility (NAF), located on the remote Adak Island, Alaska. The fuel storage and distribution system was installed by the military between the mid-1950s and the early 1990s. The fuel systems were used to support the military's missions on Adak and included aviation gasoline (avgas), jet petroleum No. 5 (JP-5), diesel, and motor vehicle gasoline (mogas). During this task order more than 9 miles of 8-inch avgas pipeline, 6-inch JP-5 pipeline (main road pipeline), 4-inch diesel pipeline, 12-inch diesel pipelines, and 8-inch mogas pipelines were successfully decommissioned. Mr. Patterson helped develop unique pressure testing techniques for indications of prior historical spills as the pipes were decommissioned. Under his supervision, field activities were completed 3 weeks ahead of schedule while the overall task order was completed 60 days ahead of schedule. Over 14,800 man-hours work completed on this high-loss potential project without a lost time or recordable accident.

Site Superintendent September 2008-November 2008

U.S. Navy, Paving and Capping, Bangor, WA

Supervised the installation of utilities and storm systems during installation of a contaminated soils cap at this former disposal pit/landfill. This former disposal site is listed on the state's MTCA sites list and required special preparation to allow the Navy to construct a building on the site. Part of the special mitigations necessary for the construction permit required the installation of a cap to enhance the protection of human health and ecological receptors. The cap was installed at this site utilizing a series of geomembrane and low permeable materials as well as construction of a large asphalt cap for parking. Total size of the cap when finished was approximately 1.2 acres. Site also included the construction of utilidors and storm water collection systems.

Site Superintendent May 2007-August 2008

U.S. Navy, Land Use Control Improvements, Former Naval Air Facility Adak, AK

Supervised the installation and replacement of gates, signs, repair of well heads and fencing. Inspection and repair of landfill caps.

Site Superintendent, July 2006 – October 2006

U.S. Navy, Three Petroleum Sites: NMCB Expanded Area, South of Runway 18-36 Area, and SWMU 62, New Housing Fuel Leak, Former Naval Air Facility Adak, AK

Supervised the excavation and removal of petroleum contaminated soil and restoration at various sites. Oversight of the construction of product recovery trenches totaling 700 feet in length and ranging from 8.5 – 16.5 feet deep.

Site Superintendent, November 2005 – March 2006

U.S. Navy, RCRA Clean Closure of Buildings 982/944 Transport, Storage, and Disposal Facility, Puget Sound Naval Shipyard, Bremerton, WA

Supervised the decontamination of the walls, floors, containment sumps, and surrounding pavement surfaces. Oversight of pavement removal and replacement in damaged areas within the containment area.

Site Superintendent, March 2007 – November 2000

U.S. Navy, Vegetative Cap Construction, High Voltage Underground Electrical, Water, Sewer Line reroute and Shoreline Erosion Control System, Puget Sound Naval Shipyard, Bremerton, WA

Supervised construction of a 2-acre vegetated cap over a contaminated site so that the property could be transferred to the City of Bremerton for development of a park. Activities involved earthwork, asbestos abatement, installation of electrical duct banks/vaults, re-routing sewer/storm systems installation, lighting circuit, and installing erosion control system along the shoreline.

Site Superintendent/Health and Safety Supervisor, October 2004 – May 2005

U.S. Navy, Operable Unit B Uplands Remedial Action – Phases 1 and 2, Puget Sound Naval Shipyard, Bremerton, WA

Supervised cleaning, inspection, and repair of 25 miles of storm drains distributed throughout the facility. Repair consisted of locating, excavating, and repairing storm lines at 265 different locations inside the shipyard using conventional cut-and-cover and specialty cured-in-place-pipe methods.

Assistant Superintendent/Health and Safety Supervisor, June 2004 – October 2004

U.S. Navy, R Street Sanitary Sewer and Storm Drain Repairs/Replacement, Puget Sound Naval Shipyard, Bremerton, WA

Assisted the Superintendent in oversight of fieldwork activities, scheduling, and crew supervision for installation of 1,000 linear feet of large diameter sewer/storm drain pipe and manholes to a depth of 16 feet through dense underground utilities along the primary access to the shipyard's busiest dry dock

Site Superintendent, December 2003 – May 2004

U.S. Navy, Shoreline Erosion Control System, Puget Sound Naval Shipyard, Bremerton, WA

Supervised site personnel and subcontractor in the installation and construction of 2,750 feet of armor rock shoreline erosion control system requiring removal of extensive debris and placement of 73,000 tons of rip rap and fish mix.

Superintendent/Health and Safety Supervisor, July 2003 – December 2003

U.S. Navy, East End Capping – Operable Unit D, Puget Sound Naval Shipyard, Bremerton, WA

Supervised the installation of a storm drain systems and an asphalt pavement cap over cement stabilized soil in the area used by the Navy for storing raw steel.

Superintendent/Health and Safety Supervisor, April 2003 – July 2003

U.S. Navy, Storm line Investigation, Puget Sound Naval Shipyard, Bremerton, WA

Supervised labor crew investigating and mapping the configuration of 25 miles of storm drains in preparation for follow-on cleaning, inspection, and repair project.

Superintendent/Health and Safety Supervisor, March 2002 – September 2002

U.S. Navy, Package Groundwater/Stormwater Treatment Plants, NFD Point Molate, Richmond, CA

Performed system evaluation and repairs. Trained personnel to ensure effective operation of treatment system. Designed and installed system upgrades.

Assistant Site Superintendent, November 2002 – December 2002

U.S. Navy, Emergency Disposal Site, Site A, Subase Bangor, Silverdale, WA

Provided field support during construction of emergency ordnance disposal site. Identified and isolated electrical utilities prior to removal. Verified process piping properly isolated prior to removal. Verified fill materials and blast barriers placed according to plan.

Lead Maintenance Technician, September 2000 – October 2002

U.S. Navy, Leachate Treatment Systems, Sites A & F, Subbase Bangor, Silverdale, WA

Performed routine operations and maintenance of leachate treatment systems to ensure effective operation. Identified and repaired defective equipment and performed non-routine maintenance. Site A and Site F are former ordnance disposal and demilitarization sites with overlapping histories that have resulted in soil and groundwater contamination by ordnance compounds, principally hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), 2,4,6-trinitrotoluene (TNT), and 2,6-dinitrotoluene (DNT). The groundwater pump-and-treat system at Site A consists of seven extraction wells with submersible pneumatic pumps, an air compressor system that operates the extraction pumps, and a water treatment system of granular activated carbon (GAC) vessels. Treated water is discharged off-site. In total, the seven extraction wells yield a total system extraction rate of approximately 5 gallons per minute (gpm). The Site F groundwater pump-and-treat system consists of 10 groundwater extraction wells, GAC water treatment, and recharge of treated water to the shallow aquifer via 7 active infiltration wells. This system, which operated at an average 531 gpm, treats water with two large GAC vessels (lead and lag) operating in series. When the lead GAC vessel is loaded with ordnance, the carbon is changed out and shipped off-site for thermal regeneration, and the lag vessel is rotated to the lead position. Plume containment is achieved by groundwater drawdown and withdrawal accomplished by three of the extraction wells in combination with groundwater mounding formed by recharge at infiltration wells positioned at the downgradient edge of the plume.

Maintenance Technician, November 2000 – October 2002

U.S. Navy Area 6 landfill Ground Water Treatment System and Area 52 Petroleum Recovery Site, Naval Air Station Whidbey Island, WA

Provided direct oversight of the operating contractor to ensure proper operation. Performed trouble shooting of site equipment. Supervised non-routine maintenance activities. Assisted with the complete overhaul of the Area 6 Pump and treat system replacing the old Modicon PLC operating system with updated, industry-leading Allen-Bradley system. The upgrade work also included the complete overhaul of a stripping tower operating at a 200 GPM capacity. These upgrades will ensure that the compliance standards are achieved well into the future at this site and lower overall operating costs through the reduction of long-term maintenance costs.

Operator, March 2002 – January 2003

U.S. Navy, Public Works Product Recovery Site, Subbase Bangor, Silverdale, WA

Performed below grade product recovery using passive skimmers at base fueling station. Performed weekly/monthly inspections of the mothballed water treatment system. Supervised the decommissioning of a 5500 gal UST.

System Operator, May 2001 – August 2002

U.S. Navy, Fuel Farm Petroleum Recovery Sites, Naval Air Station Whidbey Island, WA

Performed product recovery and monitoring operations. Performed quarterly compliance sampling and field-testing at contaminated soil removal site. Performed trouble shooting of site equipment.

Site Health and Safety Supervisor, June 2002

EFA-NW, Remedial Action Contract (RAC II), DO 10, Removal Action at Operable Unit 8, Bangor Submarine Base, WA

Performed health & safety oversight of field activities and performed air space monitoring. Assisted the site superintendent with field support during OWS removal and decommissioning.

Previous Experience

General Contractor in residential/commercial construction

EXPERIENCE SUMMARY

Over fifteen years' experience in the environmental and civil engineering, consulting, and construction industry, which include working at large scale international consulting firms, and a small regional environmental contractor. These varied work settings provided a broad range of investigative and remedial project experiences along with renewable energy project work and recent emergency petroleum spill response work. These diverse work background encompasses Federal/State/Local projects; mid to large size commercial, utility, industrial, and manufacturing investigation and remedial construction activities; and a broad range of emergency responses and associated closure.

EDUCATION

BS, Civil and Environmental Engineering, Pennsylvania State University, 1994

REGISTRATIONS/CERTIFICATIONS

Pennsylvania Engineer-In-Training

TRAINING

OSHA Hazardous Material Site Worker Refresher Course, March 2010
OSHA Waste Management Training, April 2009
Hazwoper medical examination, April 2009
U.S. DOT Hazardous Materials Training, November 2007
Tetra Tech EC Construction Supervisor Training, March 2005
Foster Wheeler Environmental Corporation Project Management 300 Training, March 2003
Foster Wheeler Environmental Corporation Project Management 200 Training, November 2001
OSHA Confined Space Entry Operations Supervisor, Attendant, & Entrant, February 2001
PADEP Land Recycling Training (Act 2), 1999
OSHA On-Site Management and Supervision Course, March 1997
OSHA Asbestos Abatement Contractor/Supervisor, EPA Model Accreditation Plan, 1996
OSHA Lead Management & Communications Training, October 1995
OSHA 40-hour Hazardous Material Site Worker Course (29CFR 1910.120), February 1995

CORPORATION PROJECT EXPERIENCE

Project Manager, Civil/Environmental Engineer, and Group Supervisor, May 2001 - Present Tetra Tech EC, Inc., Langhorne, PA

Since 2004 supervise staff of three to fifteen engineers of either environmental, site civil, structural or geotechnical work experience. Responsibilities include integration of these engineers into various programs, projects, and proposal efforts. Directly manage group workload, resources, trainings, and goals as well as complete yearly performance appraisals.

Field Manager for approximately \$4 million submerged oil assessment and recovery work associated with release of moderate to heavy crude oil into a waterway. Approximately 825,000 gallons of crude oil was released into a creek which flowed into the Kalamazoo River in southern Michigan near Marshall and Battle Creek. Managed field personnel that conducted qualitative assessment to delineate the extent of submerged oil over 40 river miles followed by quantitative sampling. Provided direct oversight of environmental sampling and sediment weep water treatment system operations associated with dredging of 3 submerged oil priority areas. Prepared standard operating procedures, work plans, and summary reports associated with submerged oil recovery from 23 priority areas. Transitioned submerged oil sites into operation and maintenance tracking and provided monitoring recommendations.

Responsible for approximately \$14 million combined budget on two separate federal department of defense projects located in Long Island, New York. A \$1 million project located in Nassau County, NY

Mr. Stavros Patselas, EIT
Project Manager - Civil/Environmental Engineer

includes design, build, operation, and maintenance of a highly time critical and community sensitive soil vapor extraction containment system. Treatment system details include twelve soil vapor extraction wells, a flow monitoring station, two blowers, a moisture separator, and vapor phase carbon. The project is design, built, and operating within six months while under state regulatory and local municipality oversight. Volatile organic compound concentrations in nearby residences have decreased since system started to levels below indoor air quality guidelines.

A \$13 million project located in Nassau County, NY includes a three-phased pre-design investigation, remedial design, and construction of a groundwater pump and treat system. Completed remedial design led to construction phase followed by operation and maintenance. Project features include: utility easement project location surrounded by dense residential area, three 12-inch diameter recovery wells, surface discharge of treated groundwater, a pre-engineered building, air stripping, liquid and vapor phase carbon treatment, 1,100 gallon per minute design flow, utility connections, and access road construction. Responsibilities of both projects includes managing all facets of project including: direct client interface, control of scope, budget, schedule, and quality, change management, community relations including presentations at public meetings, development of work plans, health and safety plans, statements of work, technical specifications, and design drawings, subcontractor management, and continuous interface and negotiations with utilities, local municipalities, and state agencies.

A previously completed \$3 million remedial project located in Suffolk County, NY included a pre-design groundwater investigation followed by design, construction, operation, and maintenance of an air sparge and soil vapor extraction remedial system. The system goal is for removal and concentration reduction of the volatile organic compounds related to fuel products in the site soils and groundwater. Project features include eight soil vapor extraction wells, eighteen air sparge wells, 60 and 75 horsepower blowers with variable speed drives, a heat exchanger, vapor phase carbon treatment, an exhaust stack, and a fabric structure.

Serve as Project Engineer on five wind energy projects. Responsibilities included preparation of design criteria documents, conceptual design of access road layout to the turbine locations as well as interconnect routing, site civil design, geotechnical desktop studies, historical research of surface and deep mine locations, and turbine foundation design. Site civil design included access road dimensions and slopes, determination of appropriate turning radius based on largest equipment, storm water management and culvert design, and location of material laydown areas, crane pads, and construction entrances. Prepared statements of work for geotechnical drilling and analysis, land survey, aerial mapping, and geophysical survey.

Served as the Resident Inspector / Engineer during construction of a groundwater treatment plant located in Blue Bell, PA for the Pennsylvania Department of Environmental Protection – GTAC III Contract. Provide complete third party oversight as the on-site representative for the client (PADEP) as well as the design engineer during all phases of construction. Responsibilities include: observing and documenting on-site activities, managing construction and design changes, assessing daily activities for conformance to industry standards and regulatory compliance, tracking material and equipment that enter or exit the site, review and approve certified payrolls for general contractor and subcontractors, review and approve monthly as-built drawings, prepare and negotiate the general contractor's monthly progress invoices, handle various public relations issues, conduct daily client interaction (external & internal), and complete project closeout. The total cost for the construction phase followed by one-year operation and maintenance was over \$5.7 million.

Project Manager during preparation of plans and specifications for the Industrial Solvents site project located in York County, PA for the Pennsylvania Department of Environmental Protection – GTAC III

Mr. Stavros Patselas, EIT
Project Manager - Civil/Environmental Engineer

Contract. Responsible for budget, project team coordination, task distribution, schedule for deliverables as well as the overall scope of work during development of design plans, specifications, and other support documentation. Participated in final design meetings with the client to review all bid documents prior to public bid advertisement.

Serve as Site Quality Control Manager during construction of Groundwater Extraction and Treatment System Infiltration Gallery in Brunswick, Maine for the U.S. NAVY - Engineering Field Activity Northeast Remedial Action Contract. Responsible for performing inspection and surveillance activities and for documenting results of these activities as required achieving the quality of construction goals required by the technical specifications and drawings. Conduct three phases of control (Preparatory, Initial, and Follow-Up) to ensure construction complies with contract requirements. Also, assist Project Site Superintendent in daily construction activities, supervision of subcontractors and craft labor, and control of materials and equipment.

Support investigation and remedial activities at three former Manufactured Gas Plant (MGP) sites located in Delaware, New York, and North Carolina, respectively. Investigation activities include site history information gathering, identification of data gaps from previous investigation activities, preparation of site maintenance and remedial investigation plans, and performing multi-media sampling programs. Remedial activities include interpretation of investigation data, preparation of feasibility study along with construction and engineering estimates, plan and specification development, task scheduling including personnel, equipment, waste disposal, and material delivery, subcontractor procurement, and performing construction and engineering oversight.

PREVIOUS EXPERIENCE

Project Manager/Engineer, July 1998 - May 2001

Lewis Environmental Group, Royersford, PA

Direct and supervise Project Management Group in proposal preparation and management of remedial projects. Remedial construction activities include personnel and equipment scheduling, work plan preparation, waste disposal and material delivery arrangements, and procuring subcontractors/vendors. Manage projects through developing site-specific operations and health and safety plans, obtaining necessary permitting, obtaining waste disposal authorization, developing necessary plans and specifications, and preparing construction documentation. Projects have involved contaminated soil delineation, removal, and disposal; cleaning and maintenance of large aboveground bulk storage tanks; facility demolition; Manufactured Gas Plant (MGP) remediation; and underground storage tank (UST) removals and necessary contamination remediation.

Recent MGP remediation activities include sites located in Lewistown, Pennsylvania; and Ashland, Pennsylvania. For Lewistown, coordinated the excavation, transportation, and disposal of purifier waste, importing and spreading pebble lime for soil pH neutralization and appropriate restoration as a material storage area. At Ashland, provided activity coordination and field oversight of two subsurface gasholder removals and mercury decontamination of a building prior to demolition.

Completed remedial projects include: design, operation, and maintenance of an on-site wastewater treatment system consisting of filter sand, granular activated carbon, and ion exchange resin in York Haven, Pennsylvania; removal of 12,000 tons of arsenic and lead impacted soil in Warminster, Pennsylvania; in-situ soil and groundwater treatment with Oxygen Release Compound (ORCâ) in Boyertown, Pennsylvania; the decontamination and demolition of a bulk fuel terminal in Hightstown, New Jersey; material removal, facility cleaning, and investigation activities for a major bulk highway material supplier in Pittston, York, Northumberland and Reading in Pennsylvania and Pennsauken in New Jersey; and sediment removal and channel reconstruction with by-pass pumping for a paper pulp plant in Downingtown, Pennsylvania.

Mr. Stavros Patselas, EIT
Project Manager - Civil/Environmental Engineer

Perform various UST projects, including remediation and closure via the Pennsylvania Land Recycling Act (ACT 2), especially in relation to the December 1999 UST conformance deadline. Tank sizes have varied from single 550-gallon installations to multiple 20,000 gallon or greater installations. UST contents have included various petroleum products, liquefied petroleum gas, acids, caustics, and other chemicals.

Completed emergency response clean-up projects as Project Manager, Supervisor, Foreman and General Laborer include: Hurricane Floyd clean-up and recovery in several communities along the Schuylkill River in Montgomery County, Pennsylvania, a major truck terminal fire in northeast Philadelphia which included work on the Delaware River and several tributary creeks, Schuylkill River clean-up from fuel oil release at a steam generation facility in Philadelphia, a fuel oil release at a bulk aggregate plant in Northampton, Pennsylvania, a chemical release on the Northeast Extension of Pennsylvania Turnpike, a chemical release at nuclear power generating facility in Montgomery County, Pennsylvania, and up to eight gas station releases in Philadelphia region, New Jersey and Delaware.

Completed industrial cleaning projects include: aboveground storage tank (AST) cleanings and inspections for major oil distributors in Philadelphia region and a pharmaceutical manufacturer in West Point and Danville, Pennsylvania; and line cleaning of various laboratory wastes for a major chemical manufacturer in Deep Water, New Jersey

Civil/Environmental Engineer, May 1995 - July 1998
Tetra Tech NUS, Inc., King of Prussia, PA

Site Manager for the investigation of five potentially hazardous CERCLA sites in the EPA Region III ARCS projects. These consisted of four Preliminary Assessments and one Site Inspection Prioritization located in Pennsylvania, Virginia, and West Virginia. Fieldwork included obtaining background information; sampling of domestic, recovery, and monitoring wells; sampling surface soils, sub surface soils, and sediments; sampling surface water; and conducting soil gas surveys. Designed, constructed, operated, and maintained a temporary activated carbon wastewater treatment system with flow rate of 75 gallons per minute in Exton, PA. In addition, provided field design test oversight for an air sparging/soil vapor extraction system and an in-situ materials precipitation system in Williamsport, PA.

Field Operations Leader for operations and maintenance of remedial treatment systems, petroleum storage tank projects, and report preparation. Operations and maintenance projects included an air sparging/soil vapor extraction system pilot study consisting of five extraction wells ranging with a total depth range of 20 to 62 feet below ground surface and one injection well with a total depth of 66.5 feet below ground surface. Petroleum storage tank projects included the removal of one UST and six ASTs. Developed the contamination nature and extent, site background, and field investigation portions in a Remedial Investigation/Feasibility Study (RI/FS) for a Navy CLEAN Contract. Prepared two Corrective Measure Study reports supporting a RCRA Facility Investigation.

Supervised subcontractor activities for a time critical removal and disposal of petroleum contaminated soil and water from basement of a future bank in Somerville, NJ. Additional remedial activities included the decontamination of basement walls and brick columns, design and installation of piping for subsurface monitoring and ventilation systems, sealing existing wall openings, and backfilling.

Site Manager for eleven Transaction Screen Processes of an Environmental Site Assessment involving a telecommunications client. Conducted extensive research including the review of government and historical records, fire insurance maps, and aerial photographs for residential, commercial, and industrial properties in southeastern Pennsylvania.

Mr. Stavros Patselas, EIT
Project Manager - Civil/Environmental Engineer

PROFESSIONAL AFFILIATIONS

American Hellenistic Education Progressive Association (AHEPA)

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