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FINAL REMOVAL ACTION WORK PLAN REMOVAL ACTION AT AREA OF CONCERN 2 ( AOC 2) FISC WILLIAMSBURG VA  
12/01/2015  
TETRA TECH EC INC

**DEPARTMENT OF THE NAVY  
NAVAL FACILITIES ENGINEERING COMMAND, ATLANTIC  
REMEDIAL ACTION CONTRACT (RAC)  
CONTRACT NO. N62470-13-D-8007  
CONTRACT TASK ORDER NO. WE36**

**FINAL  
REMOVAL ACTION WORK PLAN  
REMOVAL ACTION AT AOC 2  
NAVAL WEAPONS STATION, YORKTOWN – CHEATHAM ANNEX  
WILLIAMSBURG, VIRGINIA**

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Prepared for



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## ACRONYMS AND ABBREVIATIONS

µg/kg	micrograms per kilogram
AOC	Area of Concern
APP	Accident Prevention Plan
ARAR	Applicable or Relevant and Appropriate Requirements
Area 2	AOC 2 Area 2
Baker	Baker Environmental, Inc.
bgs	below ground surface
BMP	Best Management Practice
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CAX	Cheatham Annex
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COPC	Constituent of Potential Concern
CPR	Contractor Production Report
CTO	Contract Task Order
CY	Cubic Yard
DOT	Department of Transportation
DRO	Diesel Range Organic
ECATTS	Environmental Compliance, Assessment, Training, and Tracking System
EE/CA	Engineering Evaluation / Cost Analysis
EPA	Environmental Protection Agency
EPP	Environmental Protection Plan
ESCP	Erosion and Sediment Control Plan
E&S	Erosion and Sediment
FEAD	Facilities Engineering and Acquisition Division
FISC	Fleet and Industrial Supply Center
GRO	Gasoline Range Organic
LDR	Land Disposal Restrictions
mg/kg	milligram per kilogram
MSDS	Material Safety Data Sheet
Navy	United States Department of the Navy
NAVFAC	Naval Facilities Engineering Command
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NTCRA	Non-Time Critical Removal Action
NTR	Navy Technical Representative
PCB	Polychlorinated Biphenyls
PM	Project Manager
POC	Point of Contact
PQCP	Project Quality Control Plan
PQCM	Project Quality Control Manager

PRG	Preliminary Remediation Goal
PSLP	Penniman Shell Loading Plant
QC	Quality Control
RAC	Remedial Action Contract
RACR	Remedial Action Completion Report
RAWP	Remedial Action Work Plan
R/C/I	Reactivity/Corrosivity/Ignitability
RCRA	Resource Conservation and Recovery Act
RPM	Remedial Project Manager
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SDS	Safety Data Sheet
SF	square foot
SI	Site Inspection
SPSA	Southeastern Public Service Authority
SSHO	Site Safety and Health Officer
SVOC	Semi-Volatile Organic Compound
SWPPP	Stormwater Pollution Prevention Plan
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
T&D	Transportation and Disposal
TPH	Total Petroleum Hydrocarbon
TtEC	Tetra Tech EC, Inc.
USEPA	United States Environmental Protection Agency
VAC	Virginia Administrative Code
VDEQ	Virginia Department of Environmental Quality
VESCH	Virginia Erosion and Sediment Control Handbook
VOC	Volatile Organic Compound
WMP	Waste Management Plan
WPNSTA	Naval Weapon Station

## **1.0 INTRODUCTION**

Tetra Tech EC, Inc. (TtEC) has been contracted by the United States Department of the Navy (Navy), Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic under Remedial Action Contract (RAC) N62470-13-D-8007, Contract Task Order (CTO) WE36 to perform a Non-Time Critical Removal Action (NTCRA) at Area of Concern (AOC) 2 at Naval Weapons Station (WPNSTA) Yorktown – Cheatham Annex (CAX) located in Williamsburg, Virginia. The NTCRA at AOC 2 will include removal action activities for AOC 2 Area 2 (Area 2) debris and impacted soil per the Statement of Work, dated February 4, 2015, and as described in the Engineering Evaluation/Cost Analysis (EE/CA) (CH2M Hill, 2015). This Removal Action Work Plan (RAWP) and supporting appendices present the operational approach for the successful completion of the project.

The NTCRA will be performed in accordance with the Comprehensive Environmental Restoration, Compensation, and Liability Act (CERCLA), as amended, the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

### **1.1 Location and Background Information**

CAX is located on the site of the former Penniman Shell Loading Plant (PSLP), a large powder and shell loading facility operated by the DuPont Company during World War I, which closed in 1918 and was dismantled shortly thereafter. Between 1923 and 1943, the property was used for farming or remained idle until CAX was commissioned in 1943 as a satellite unit of the Naval Supply Depot to provide bulk storage facilities and to serve as an assembly and overseas shipping point during World War II. The facility is divided into two separate parcels, with the larger parcel situated along the banks of the York River. Almost all of the activities at CAX (administration, training, maintenance, support, and housing) take place in the larger parcel. The smaller parcel is used mainly as a watershed protection area. In 1987, CAX was designated as the Hampton Roads Navy Recreational Complex. In 1998, control of CAX was transferred from Fleet and Industrial Supply Center (FISC) to WPNSTA Yorktown. The current mission of CAX includes supplying Atlantic Fleet ships and providing recreational opportunities to military and civilian personnel.

AOC 2 is a less-than-1-acre wooded site located to the north of Garrison Road, along the southern perimeter of CAX. Historical information indicates that AOC 2 was an unlined, non-permitted disposal area with unknown dates of debris disposal. AOC 2 was identified during site visits by the Navy, United States Environmental Protection Agency (USEPA), Virginia Department of Environmental Quality (VDEQ), and Baker Environmental, Inc. (Baker) in late 1997 and early 1998 and consists of several rows of concrete foundation piers that at one time supported a shipping house associated with the former DuPont Company PSLP facility. The majority of structures associated with the PSLP facility were demolished between 1918 and 1925. Grass-covered lanes leading to the site area are likely remnants of former railroad lines that have been removed. Partially buried glass IV bottles (of which the majority were labeled “dextrose”) and unlabeled, empty, 55-gallon drums, respirator cartridges, deer carcasses, and surplus military clothing were discovered in the area. Several mounds also present in the area were suspected to contain buried

debris (CH2MHill, 2015). Based on the types of debris observed during test trenching activities, AOC 2 was separated into three areas: Areas 1a and 1b contain dextrose IV bottles, Area 2 contains unused respirator cartridges and empty 55-gallon drums, and Area 3 contains surplus military clothing. The CAX Partnering Team agreed the debris in Areas 1a, 1b, and 3 (dextrose IV bottles and military clothing) is not a concern or a source regulated under CERCLA; therefore, it does not require removal. There are no previously recorded archaeological sites or historic buildings/structures within the AOC 2 site vicinity. The topography of AOC 2 is predominantly flat. No wetlands or other surface water bodies are located at AOC 2, and there are no nearby water bodies down-gradient of the site. Surface runoff at the site is anticipated to pond and infiltrate into the subsurface or evaporate. In general, the native soil is predominantly composed of clay and silt at AOC 2. As observed during test trenching activities in 2001, a sand fill layer was found to be present over buried materials in some areas of AOC 2 (CH2MHill, 2015). The first encountered groundwater underlying AOC 2 is the Cornwallis Cave aquifer, at depths ranging from approximately 22 to 33 feet below ground surface (bgs); groundwater is expected to flow southeast toward King Creek (CH2MHill, 2015). A facility and site location map is included as Figure 1.

## **1.2 Summary of Previous Activities**

### **1.2.1 1998 Field Investigation**

In October 1998, a field investigation was completed in Area 1a and Area 2 that included geophysical surveying as well as soil and groundwater sampling via direct-push technology to gain a better understanding of the nature and extent of possible contamination at AOC 2. During the field investigation, twelve 55 gallon drums were observed at the ground surface, partially buried and empty. Based on the results of the geophysical survey, areas of significant magnetic anomalies were delineated that could potentially coincide with buried debris (CH2MHill, 2015).

The concentrations of several inorganic constituents in soil exceeded ecological screening criteria and the concentrations of iron indicated a potential (non-carcinogenic) risk to human health. There were no potential unacceptable risks identified for groundwater. It was recommended that the natures of the geophysical anomalies and potential sources of contamination be identified by excavating six shallow test pits in the vicinity of the most significant detected anomalies (CH2MHill, 2015).

### **1.2.2 1999 Field Investigation/2000 Supplemental Test Pit Investigation**

In November 1999, six test pits were excavated and sampled at AOC 2 to determine the natures of geophysical anomalies observed during the October 1998 field investigation. At the two test pits excavated in Area 2, empty drums and respirator cartridge canisters were encountered. During this investigation, the debris that was unearthed or collected from the ground surface (including 43 empty 55-gallon drums, 280 empty dextrose IV bottles, and 8,000 pounds of respirator cartridges from Area 2) was disposed offsite; however, the majority of the buried debris was not removed. One respirator cartridge canister was submitted for analysis of full toxicity characteristic leaching procedure (TCLP) parameters and Resource Conservation and Recovery Act characterization. Because cadmium and lead concentrations exceeded TCLP levels, the Navy, in consultation with

the USEPA and VDEQ, agreed to expand the test pit program to define the extent of buried debris and canisters. In 2000, a supplemental test pit investigation was conducted and a total of 47 exploratory test pits were advanced at AOC 2, with 19 of the test pits located in Area 2. Materials encountered included respirator cartridge canisters, empty drums, dextrose IV bottles, and military clothing. In general, the test pits only extended to the top of debris to avoid unearthing excessive amounts of waste. However, the Area 2 test hole was advanced to an average of 10 feet bgs over an approximate 25 foot by 15 foot area in order to remove some of the buried respirator cartridges. The cartridges appeared to have been deposited in excavated trenches. The removal of cartridges from the test hole was stopped in late January 2000 due to snow, wet site conditions, and the large volume of waste that had been excavated. Eight thousand pounds of respirator cartridges from Area 2 were removed for offsite disposal. The lateral extent of the buried debris was not completely defined. During this supplemental test pit investigation, four confirmatory soil samples were collected. Confirmatory sample analytical results indicated little, if any, impact to soil or groundwater at AOC 2. Based on the results of the supplemental test pit investigation, additional buried dextrose IV bottles, empty drums (some coated with tar), respiratory cartridge canisters, and unused military uniforms (quantities not documented) were observed at AOC 2. A limited geophysical investigation was recommended to delineate the lateral extent of buried respirator cartridge canisters and the location of the eastern perimeter of disposal along Deer Pit Road, and a test pit investigation was recommended to confirm the results of the geophysical investigation (CH2MHill, 2015).

### 1.2.3 2001 Trenching Activities

In 2001, a total of 15 trenches were excavated to confirm the presence or absence of buried respiratory cartridges along Deer Pit Road and to obtain additional information concerning subsurface materials potentially buried at AOC 2. Dextrose IV bottles, clothing, metal debris, and empty 55-gallon drums were observed in the trenches. Three of the trenches were excavated in Area 2 and buried drums were observed in two of the three trenches. No samples were collected for laboratory analysis. The horizontal and vertical extents of the dextrose IV bottle dump along Deer Pit Road were delineated and debris was observed to be confined primarily to beneath the road, with some surface debris outside the road area (CH2MHill, 2015).

### 1.2.4 2012 Multiple AOC Site Inspection

Human health and ecological risk screenings of surface soil and subsurface soil samples collected in 1998 and 1999 were conducted and concluded that there may be potentially unacceptable risks to human health and ecological receptors from exposure to surface and subsurface soil within Area 2. The Site Inspection (SI) Report recommended an interim removal action for Area 2 to remove the debris (respirator cartridges and empty 55-gallon drums) and the collection of post-removal soil samples.

### 1.2.5 2014 Site Investigation Supplemental Soil Sampling

In May 2014, a supplemental soil investigation was conducted outside of Area 2 to augment the SI dataset for the purpose of updating the human health (chromium and arsenic) and ecological

(mercury and iron) risk evaluations to determine whether these constituents pose potentially unacceptable risks to human health and the environment, and to determine whether the removal action proposed for Area 2 needs to also address soil “hot spots” outside of Area 2, specifically in Area 1b. The supplemental investigation included the collection of surface soil (0- to 6-inch depth) samples and subsurface soil (various depths) samples via a hand auger in proximity to the historical sample locations outside of Area 2. The site investigation was conducted in accordance with the approved sampling and analysis plan (CH2M HILL, 2015). Based on the results of the supplemental soil sampling, no soil “hot spots” outside of Area 2 were identified leaving only Area 2 the focus of the Removal Action.

### **1.3 Summary of Project Activities**

The major components of the NTCRA are listed below and are discussed further in Section 3.0.

- Mobilization and Setup,
- Clearing Activities,
- Excavation of Soil and Debris,
- Mechanical Screening of Soil,
- Sampling Activities,
- Backfilling and Site Restoration,
- Transportation and Disposal (T&D) of Waste, and
- Demobilization.

### **1.4 Project Schedule**

Activity-specific timelines and critical paths are presented in the Project Schedule located in Appendix A.

### **1.5 Plan Organization**

The remainder of this RAWP is organized as follows:

- Section 2.0: Addresses project management and planning activities.
- Section 3.0: Describes field activities that will be performed in support of the NTCRA.
- Section 4.0: Presents the Erosion and Sediment Control Plan (ESCP).
- Section 5.0: Presents the Waste Management Plan (WMP).
- Section 6.0: Presents the Environmental Protection Plan (EPP).
- Section 7.0: Presents the Project Quality Control Plan (PQCP).
- Section 8.0: Presents the Sampling and Analysis Plan (SAP).
- Section 9.0: Presents the Accident Prevention Plan (APP).
- Section 10.0: Presents references used in preparation of this RAWP.
- Appendix A: Includes the project schedule.
- Appendix B: Includes the Hazardous Waste Accumulation Area Inspection Log.
- Appendix C: Includes the PQCP.
- Appendix D: Includes the SAP.

- Appendix E: Includes the APP.

## **2.0 PROJECT MANAGEMENT AND PLANNING**

### **2.1 Key Personnel**

TtEC personnel involved in the successful completion of this project include the Project Manager (PM), Project Superintendent, Project Quality Control Manager (PQCM), and Site Safety and Health Officer (SSHO).

#### **2.1.1 Project Manager**

The PM will ensure compliance with the RAWP and is the project team point of contact (POC) with the Navy. The PM is responsible for managing the day-to-day project activities, ensuring documentation and deliverables meet contract requirements, monitoring costs and accounting, and controlling the overall schedule.

The Contract Administration Manager and Project Controls Manager will support the PM with contractual and budget issues. The Contract Administration Manager is the POC with the Navy Contracting Officer and ensures compliance with prime contract requirements. The Project Controls Manager is responsible for accumulating project costs expended to date, forecasting costs to completion, preparing monthly invoices, and maintaining and updating the project schedule.

#### **2.1.2 Project Superintendent**

The Project Superintendent will report directly to the PM and is responsible for daily oversight of field activities, interface with facility personnel, and obtaining necessary permits. The Project Superintendent is responsible for conformance of all site work with requirements and procedures identified in the APP (Appendix E) and the PQCP (Appendix C). In addition, the Project Superintendent will complete a daily Contractor Production Report (CPR).

#### **2.1.3 Project Quality Control Manager**

The PQCM is responsible for implementation of the PQCP and reports directly to the Quality Control (QC) Program Manager. The PQCM will conduct the three phases of inspection, conduct surveillance of site activities, prepare Daily QC Reports, and conduct QC meetings. The PQCM will attend and assist the Navy at the pre-final inspection and the final acceptance inspection. The PQCM has the authority to stop work. For this project, the Project Superintendent will also serve as the PQCM.

#### **2.1.4 Site Safety and Health Officer**

The SSHO is responsible for implementing the APP to satisfy that federal, state, and local regulations are consistent with site conditions and activities. The SSHO will oversee the day-to-

day activities to ensure that work is in compliance with the APP. For this project, the Project Superintendent will also serve as the SSHO.

## **2.2 Subcontractors**

As part of the implementation of field activities, various subcontractors will be utilized throughout the project duration. Subcontractor services may include site setup, clearing, utility locating, excavation, T&D of waste, and site restoration.

## **2.3 Meetings, Plans, and Reports**

This section describes meetings that will be conducted, plans that have been prepared, and reports that will be submitted during the implementation of the NTCRA at AOC 2.

### **2.3.1 Pre-Construction and Mutual Understanding Meeting**

Prior to the start of construction activities, a pre-construction and mutual understanding meeting will be attended by TtEC representatives to: Discuss the planned work activities and schedule, establish lines of communication, address facility and site access requirements, address site logistics, confirm work hours, review reporting requirements, and discuss other pertinent site information. In addition, planned tree clearing activities will be coordinated with the Natural Resources Media Manager. The PQCM will prepare the meeting minutes and submit to the Navy for concurrence.

### **2.3.2 QC Progress Meetings**

QC Progress meetings will be held on a regular basis to discuss work progress, submittal status, and any quality issues. Invitees will include representatives from NAVFAC, CAX, TtEC, and any other pertinent personnel. The TtEC PQCM will prepare and distribute the meeting agenda and minutes.

### **2.3.3 Pre-Construction Plans**

Plans prepared as part of the pre-construction effort include this RAWP and the supporting Site Plan, Traffic Plan, ESCP, WMP, EPP, APP, PQCP, and SAP. The Site Plan and Traffic Plan are described below. The ESCP, WMP, and EPP are included as Sections 4.0, 5.0, and 6.0, respectively. The remaining plans are included as appendices to this RAWP as noted in Section 1.5.

#### **2.3.3.1 *Site Plan***

The proposed site plan is included as Figure 2. The site plan identifies the work area and support areas that will be used during the field activities. High-visibility fencing, barriers, and signage will be used to restrict access to the site as necessary. Proposed locations for the support areas will be subject to approval by the Navy.

### 2.3.3.2 *Traffic Plan*

Personnel vehicles, vendor delivery trucks, and material haul trucks will gain access to CAX via the main gate located on Sanda Avenue and proceed to the site using the route shown on Figure 3. All vendor delivery trucks and material haul trucks will be required to go through the truck inspection station at the Yorktown Naval Weapons Station prior to gaining access aboard CAX. Access to the site will be provided by the construction of a temporary stone haul road on Connector Road between Garrison Road and Area 2 of site AOC 2 (Figure 2). Traffic controls will be implemented as necessary to provide for the safe passage of vehicles, minimize impact to facility operations, and enable field activities to be completed in an efficient and safe manner. On-site traffic patterns will be established, spotters will be used, and signage will be placed as appropriate. In general, trucks will be lined up along Garrison Road and backed in one at a time to be loaded or to place imported fill.

### 2.3.4 Daily Reports

A daily CPR and QC Report will be completed whenever on-site activities occur and will be submitted to pertinent personnel as determined at the pre-construction meeting. Copies of the daily reports will be retained in the project files.

### 2.3.5 Remedial Action Completion Report

Upon completion of all field activities, a Remedial Action Completion Report (RACR) will be prepared in accordance with Department of the Navy Guidance to Documenting Milestones Throughout the Site Closeout Process (March, 2006). The RACR shall contain all the requirements of the Project Construction Completion Report following the Remedial Action Report format in accordance with *Close Out Procedures for National Priorities Sites EPA 5409-R-98-016*. This report will specifically include, but is not limited to, the following:

- A statement that the work was conducted in accordance with the Work Plan, with any exceptions noted.
- Geographical Information Systems and appropriate data management requirements to load information into the Naval Installation Restoration Information Solution shall also be provided.
- A summary of volumes of material shipped and disposed of at each location
- Copies of analytical reports from characterization of soil/waste (may be provided electronically within the report)
- Copies of Manifests/Bills of Lading, and certified weight slips (may be provided electronically within the report)
- Copies of Certificates of Treatment/Disposal (may be provided electronically within the report)

An internal draft RACR will be submitted to the Navy for review and comment following the completion of field activities. Following Navy review, comments will be addressed and

incorporated into a draft report for regulatory review. Following regulatory review, comments will be addressed and incorporated into a final report submitted to all pertinent parties.

### **3.0 FIELD ACTIVITIES**

This section details the project activities that will be implemented by TtEC and its subcontractors to complete the NTCRA. Field activities include: Mobilization, setup, and clearing activities; excavation and mechanical screening; confirmatory sampling; T&D of waste; backfill and site restoration; and demobilization.

#### **3.1 Mobilization and Setup**

##### **3.1.1 Mobilization**

Project personnel, equipment, materials, and temporary facilities will be mobilized to CAX as needed to execute the project activities. Temporary facilities include an office trailer, mobile generator, portable toilets, hand wash stations, diesel tank with secondary containment, and dumpster for general trash service. Equipment expected to be used includes, but is not limited to, an excavator, loader, and mechanical screener. TtEC employees and subcontractors will comply with WPNSTA Yorktown and CAX security requirements upon mobilization and throughout the course of the project. All site personnel will require RapidGate badges or will be required to obtain daily temporary passes for base access. All vendor equipment and material delivery trucks and waste haul trucks will be required to go through the truck inspection station at the Yorktown Naval Weapons Station prior to accessing CAX. In advance of these trucks arriving to the truck inspection station, required information for each truck will be submitted to the Facility Engineering and Acquisition Division (FEAD) representative for providing to the appropriate Base security personnel.

##### **3.1.2 Utility Mark-out**

A utility mark-out will be completed for the work areas prior to performing any intrusive activities. Virginia Miss Utility will be notified at least 72 hours, but no more than 10 working days before the start of intrusive work. In addition, a third party utility locator will be utilized to locate and identify subsurface utilities. Utility markings identified will be maintained throughout the duration of the project and dig permit tickets will be updated as needed.

##### **3.1.3 Initial Site Survey**

A surveyor licensed in the Commonwealth of Virginia will be subcontracted to perform an initial site survey. The survey will be conducted to: Capture the pre-construction topography and any pertinent features of Area 2 as well as locate and stake the initially assumed horizontal extents of the excavation areas as indicated in the EE/CA.

### 3.1.4 Pre-Construction Sampling and Analysis

In-situ waste characterization sampling and clean fill borrow source sampling will be performed prior to full mobilization, such that all approvals are received for waste disposal and clean fill use prior to starting construction activities. Additional details of sampling activities are included in Section 3.5.

### 3.1.5 Installation of Erosion and Sediment Controls

Because the limits of disturbance for the NTCRA are less than 1 acre, a formal Stormwater Pollution Prevention Plan (SWPPP) is not required. However, temporary erosion controls will be used to protect the surrounding land and water resources at the site. Control measures to be used will include a stone construction entrance; silt fence for excavation areas, staging areas, and along the temporary haul road; dust control measures; and hay bales with plastic sheeting for temporary containment areas. An ESCP further describing the controls to be implemented at the site has been included in Section 4.0.

### 3.1.6 Access Road Installation

The temporary stone access road (approximately 125 feet by 12 feet wide) will be installed between Garrison Road and Area 2 with stone and underlying non-woven geotextile fabric. As much as practical, stone from AOC 7 (CTO WE35) will be reused to construct the temporary access road and stone construction entrance. The access road will provide equipment and haul truck access to the excavation areas as shown on Figure 2. Following minimal vegetative clearing of the pathway, non-woven geotextile will be placed on the ground and approximately 6 inches of stone will be placed, graded, and tracked in for compaction utilizing a small bull dozer or other tracked equipment as determined most effective and efficient. Removal of the access road is discussed in **Section 3.6**.

### 3.1.7 Mechanical Screener Setup

A mechanical screener equipped with a 2-inch screen will be mobilized to the site and setup at a relatively flat area on Connector Road. Non-woven geotextile fabric and stone will be placed and compacted for providing a stable and level surface for setting and operating the mechanical screener. Silt fence will be installed around the perimeter of the screening operation. The screener will be positioned to enable safe and efficient feeding of excavated material into the unit for processing such that screened material will be transferred via conveyor directly into haul trucks and oversized material (ie... drum debris, respirator cartridges) will come off the 2-inch screen into an adjacent staged roll-off box fitted with a secondary containment liner or into drums placed within a secondary containment constructed with hay bales and plastic sheeting.

## 3.2 **Clearing Activities**

Vegetative clearing will be completed for the construction of the temporary access road and to access excavation areas. However, very minimal tree clearing is anticipated and shall only occur within close proximity of Area 2 such that impact to the Colonial Parkway view shed is not

anticipated. If, for some reason, tree clearing that may impact the Colonial Parkway view shed is necessary, the Navy and other pertinent parties will be notified prior to doing so.

Most of the pathway along Connector Road is clear, but minimal tree clearing will be required to enable construction of the temporary access road for approximately 125 feet long by 12 feet wide. Minimal tree clearing will also be required to provide equipment access to the excavation areas and provide adequate clearance for equipment movement. Trees that are removed shall be cut to just above the ground surface such that no intrusive ground disturbance occurs. Unless within the planned excavation extents, stumps and root balls shall remain undisturbed. Any stumps and root balls that are removed within excavation extents will be properly disposed. Also, tree removal will be minimized by strategic selection of the access pathway and such that preference will be given for the removal of small, unhealthy, or dead trees rather than mature healthy trees whenever reasonably possible. Felled trees will be appropriately sized and staged for removal and disposition by the Base. Small trees, brush, and branches will be chipped on site and reused as mulch during site restoration.

### **3.3 Excavation of Soil and Debris**

Excavation activities will commence upon completing the following activities: obtaining a dig permit, site setup, and receiving required approvals for waste disposal and clean fill. The estimated excavation area is shown on Figure 4.

An estimated total of 1,304 cubic yards (CY) of debris and impacted soil will be excavated from Area 2. The 1,304 CY of excavated waste material includes a 1,400 square foot (SF) footprint to be excavated to a depth of 9 feet bgs (467 CY), a 2,300 SF footprint to be excavated to a depth of 6 feet bgs (511 CY), and approximately 326 CY excavated for appropriate sloping of the excavations. Because the excavations are greater than 5 feet bgs, sidewalls will be sloped according to the type of material present. The excavation will be sloped in accordance with applicable OSHA regulations as determined by the TtEC excavation competent person. Soil removed from sidewalls for sloping will be handled in a similar manner as contaminated soil for subsequent offsite disposal. The excavation will be visually inspected to ensure all debris is removed from within the area. Actual excavation depths will be based on removing to a depth one foot beyond the visible limit of debris and post-excavation confirmation sampling and laboratory analysis. All waste material will be removed and staged within the excavation limits in preparation for mechanical screening. Dust suppression measures will be implemented, as needed, during earth disturbance activities. The anticipated groundwater depth is approximately 22-33 feet bgs and therefore, dewatering is not planned.

Following completion of excavation activities, a topographic survey will be completed by a surveyor licensed in the Commonwealth of Virginia to capture the spatial coordinates of the lateral and vertical extents of the excavation areas. In addition, confirmation sample locations will be recorded. This survey data will be provided as part of closeout documentation.

### 3.4 Mechanical Screening of Soil

Excavated waste material will be initially staged within the excavation area boundary and then transferred by a front-end loader to the mechanical screener. The waste material will be processed through the mechanical screener equipped with a two inch screen for separating respirator cartridges and drum debris. Screened soil (containing broken glass dextrose bottles) will be loaded directly into haul trucks by the screener conveyor system for transport to an approved non-hazardous disposal facility. Oversized material, including respirator cartridges and drum debris, separated by the screener will go into an adjacent staged roll-off box fitted with a secondary containment liner or into drums placed within a secondary containment constructed with hay bales and plastic sheeting. The respirator cartridges, drum debris, and any other oversized debris will then be separated manually and/or with heavy equipment into appropriate waste streams for subsequent offsite disposal. The respirator cartridges will be separated and placed into drums or roll-off boxes for assumed offsite transport and disposal as a hazardous waste, or as otherwise determined appropriate per waste characterization. Drum debris will be separated, placed into a roll-off box and shipped for recycling, or as otherwise determined appropriate per waste characterization.

### 3.5 Sampling Activities

Sampling activities shall include, clean fill verification sampling for common fill and topsoil, pre-excavation waste disposal characterization sampling, and post-excavation confirmation sampling at Area 2. Clean fill will not be imported until approved for use on site, waste material will not be removed until waste acceptance approval is received from an approved disposal facility, and backfilling will not commence until confirmation samples indicate that cleanup goals have been achieved. Clean fill sampling and waste characterization sampling will be completed prior to site mobilization such that waste is approved for disposal and clean fill is approved for site use prior to commencing removal activities.

#### 3.5.1 Clean Fill Verification Sampling

Clean fill verification sampling will be performed prior to importing any backfill materials to the site. One five point composite sample will be collected for each type of material (i.e. common fill and topsoil) from each potential source and shipped to an off-site laboratory for analysis. The clean fill verification samples will be analyzed for the parameters indicated in the table below.

**Table 3-1 Clean Fill Verification Testing Parameters**

<b>Parameter</b>	<b>Analytical Method</b>
Target Compound List (TCL) Volatile Organic Compounds (VOCs)	EPA (Environmental Protection Agency) Method 8260B
TCL Semi-Volatile Organic Compound (SVOCs)	EPA Method 8270D
TCL Pesticides	EPA Method 8081B
Polychlorinated Biphenyls (PCBs)	EPA Method 8082A

<b>Parameter</b>	<b>Analytical Method</b>
Explosives	EPA Method 8330B
Herbicides	EPA Method 8151A
Total Petroleum Hydrocarbons (TPH)	EPA Method 8015C
Target Analyte List (TAL) Metals (including mercury, cyanide, & hexavalent chromium)	EPA Method 6010C/7471B/9012B/7196A

Upon receipt of the laboratory analytical report for each clean fill verification sample, a borrow source assessment report will be prepared and submitted to the Tier I Partnering Team for review. The report will include: Type of material; proposed use of material; name and address of borrow source; quantity available; physical description and origin of the representative material; and a data summary table comparing the results to the established maximum concentrations agreed upon by the Tier I Partnering Team and provided in the SAP (Appendix D). Borrow material will not be imported to the site until approved by the Tier I Partnering Team.

### 3.5.2 Waste Disposal Characterization Sampling

In-situ sampling and analysis will be conducted for Area 2 to properly characterize the solid waste material for off-site transport and disposal prior to excavation activities. Samples will be collected using a mini excavator, or similar at a frequency of approximately 1/1000 CY. It is anticipated that the following solid waste characterization samples will be collected:

- 2 samples for excavated soil/debris
- 2 samples for cartridges

If wet decontamination methods are used, a waste characterization sample of the drummed decontamination water will also be collected. Each waste characterization sample will be a five-point composite (discrete grab for VOC analysis) representative of the waste material to be removed and disposed. The samples will be shipped to an off-site laboratory for analysis with a 10 day turn-around time. Analytical methods will be determined by the disposal facility's acceptance criteria, but are expected to include full TCLP (VOCs, SVOCs, metals, pesticides/herbicides), RCRA Characteristics (reactivity/corrosivity/ignitability [R/C/I]), TPH Diesel Range Organics (DRO)/Gasoline Range Organics (GRO), and polychlorinated biphenyls (PCBs). The sample results will be submitted to the Navy as part of the waste profile package for generator signature by a Navy representative prior to submitting to the proposed landfill for waste acceptance approval. Based on site history and prior sampling data, it is expected that the soil/dextrose bottle/drum debris and decontamination water (if generated) will be suitable for non-hazardous transport and disposal. It is anticipated that the cartridges will require hazardous transport and disposal due to historical TCLP lead and cadmium exceedances.

During excavation activities, if partially or fully intact drums are uncovered such that they contain liquids and/or other residual solids, the drums will be set aside for waste characterization and subsequent proper disposal.

Additional waste characterization may be necessary if post-excavation confirmation samples collected from the removal areas indicate that additional excavation is required. The additional samples would be collected at the same frequency and analyzed for the same parameters as the pre-excavation waste characterization samples. Additional waste characterization is not planned.

### 3.5.3 Post-Excavation Confirmation Sampling

Post-excavation confirmation samples will be collected to confirm the horizontal and vertical extent of excavation is sufficient. Confirmation samples will be analyzed by an off-site laboratory for the constituents of potential concern (COPCs) at Area 2. The COPCs and their respective preliminary remediation goals (PRGs) are shown in Table 3-2.

**Table 3-2 Preliminary Remediation Goals for Confirmation Sampling**

COPC	PRG
Arsenic	6.7 mg/kg
Chromium (hexavalent)	3.0 mg/kg
Chromium (total)	120,000 mg/kg
Mercury	0.24 mg/kg
4,4'-DDT	100 µg/kg
Aroclor -1260	2.4 mg/kg

Notes:  
 mg/kg = milligram per kilogram  
 µg/kg = microgram per kilogram  
 COPC = constituent of potential concern  
 PRG = preliminary remediation goals

Floor samples will be collected at a frequency of one per 625 SF and sidewall samples at a frequency of one per 50 linear feet. Post-excavation samples will be collected within 0-2 feet bgs. A total of 6 floor samples, 6 sidewall samples, and 2 QC samples are anticipated. However, additional samples may be required if the excavation extents increase from initial limits.

All confirmation samples will be shipped to an off-site laboratory for analysis with 2 day turn-around times for lab results. If the results of the post-excavation sampling indicate the removal area will extend beyond the currently anticipated extents, the Navy will be notified immediately of the changed condition. Additional details of the post-excavation confirmation sampling are included in the SAP (Appendix D).

### 3.6 Backfilling and Site Restoration

The excavation areas will be backfilled using approved clean fill materials (i.e., common fill and topsoil) to original grade. Approximately 1,525 CY common fill and 105 CY topsoil will be imported from the approved borrow source(s) to Area 2 and directly placed into the excavation. A tracked excavator and/or bull dozer will be used to place the common fill within the excavations.

The common fill will be placed in approximate 12-inch lifts and compacted to grade. Lifts placed below 4 feet bgs will be bucket compacted to eliminate the need for personnel entry into the excavation. Lifts 4 feet bgs and above will be compacted by bucket or heavy equipment tracks. Common fill will be placed to approximately 6 inches below the final grade, followed by the placement of a 6-inch layer of topsoil. Fill source sampling and approval is discussed in Section 3.5.2.

Following completion of excavation and backfill activities, the site will be restored to pre-construction conditions and to match surrounding grade. Site restoration will include seeding disturbed areas with an appropriate seed mix and stabilizing with straw or wood mulch and/or erosion control matting. Once restoration is complete, the surveyor will return to the site to capture the as-built site conditions.

After restoration of Area 2 is completed, the access road and construction entrance will be removed. The gravel will be removed and staged at a designated location for future reuse by CAX. The underlying fabric will be removed and disposed of as general construction debris. Disturbed areas will be restored via topsoil placement, seeding, and placement of mulch. Upon stabilization of the restored areas, temporary erosion controls will be removed and disposed of as general construction debris.

### **3.7 Transportation and Disposal**

The solid waste material (soil, drum debris, and cartridges) and decontamination water (if generated) will be characterized and a generator signed waste profile form and supporting laboratory analytical reports will be submitted to the proposed disposal facility for waste acceptance approval. Following waste acceptance approval from the disposal facility, the contaminated soil and debris will be removed from the excavation areas, screened and separated into appropriate waste streams, and loaded into dump trucks, roll-off boxes, and/or drums as appropriate for transport to the approved disposal facility. Waste transport and disposal volumes are estimated at 1,108 CY of non-hazardous soil and drum debris and 196 CY of hazardous cartridges. It is assumed that the soil and drum debris waste material will be suitable for non-hazardous transport and disposal at the Southeastern Public Service Authority (SPSA) Regional Landfill in Suffolk, Virginia, which is a Resource Conservation and Recovery Act (RCRA) Subtitle D landfill facility. Also, if a significant volume of steel drum debris is removed and characterized as non-hazardous, this scrap material may be disposed of at a recycling facility. The decontamination water, if generated, is anticipated to be suitable for non-hazardous transport and disposal at a facility to be determined. Filter cartridges are assumed to be suitable for transport offsite to the US Ecology Hazardous Waste facility in Michigan, which is a USEPA offsite rule-approved disposal facility. All dump trucks will be dry decontaminated, inspected, loads covered, and provided with manifests prior to leaving the site. All dump trucks will follow the designated traffic route for traveling to and from the site and not exceed posted speed limits. Base roadways shall be periodically inspected and kept clean at all times.

### **3.8 Demobilization**

Upon completion of the site activities and acceptance of the restored site by the Navy, demobilization activities will commence. Demobilization will include removal of temporary facilities and demobilization of personnel, equipment, and materials. Prior to demobilization, equipment that came into contact with contaminated material will be decontaminated using dry decontamination methods. If wet decontamination methods are determined to be necessary, decontamination waste water will be captured and drummed for waste characterization and disposal, as described in Section 3.5.3.

### **4.0 EROSION AND SEDIMENT CONTROL PLAN**

The topography of AOC 2 is predominantly flat. No wetlands or other surface water bodies are located at AOC 2, and there are no nearby waterbodies down-gradient of the site. In general, the native soil is predominantly composed of clay and silt. Surface runoff at the site is anticipated to pond and infiltrate into the subsurface or evaporate (CH2MHill 2015). As observed during test trenching activities in 2001, a sand fill layer was found to be present over buried materials in some areas of AOC 2 (CH2MHill, 2015). The first encountered groundwater underlying AOC 2 is the Cornwallis Cave aquifer, at depths ranging from approximately 22 to 33 feet bgs; groundwater is expected to flow southeast toward King Creek (CH2MHill, 2015).

A formal SWPPP and substantive compliance with the Construction Stormwater General Permit is not required since the limits of disturbance is expected to be less than one acre, including the excavation areas, access road, and support area. In addition, runoff from project activities is not anticipated to occur such that wetlands or surface waters would be impacted. However, an ESCP has been prepared to describe the erosion and sediment (E&S) controls that will be implemented at the site to limit the migration of soil and sediment from disturbed areas, including COPCs that may be present within contaminated soils. Additional measures will be provided for stabilization and restoration of the site following fill placement and grading, which are included in the ESCP.

Earth disturbing activities that will be performed at Area 2 include vegetative and tree clearing (with minor grubbing of root balls only if required for access or within the excavation footprint), excavation of soil and debris as defined in the Work Plan, creation of staging areas for soil screening operations, backfill placement, and access road installation/removal.

E&S control devices and procedures will be installed, inspected, and maintained in accordance with the “Virginia Erosion and Sediment Control Handbook (VESCH),” Third Edition, 1992, as prepared by the Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation. A copy of this Handbook (namely referenced Sections of Chapter 3 as referenced in this ESCP) will be available onsite for reference (hard copy or electronically) for installation and maintenance guidelines.

Proposed E&S control measures include (where required):

- Straw bale barrier

- Temporary stone construction entrance
- Silt fence
- Dust control
- Permanent seeding and mulching.

The anticipated locations where the silt fence and temporary stone construction entrance Best Management Practices (BMPs) will be placed are shown on the Site Plan, Figure 2 of the Work Plan.

E&S controls will be inspected at least once per week and within forty-eight hours of precipitation events. Identified deficiencies will be promptly corrected. Temporary erosion and sediment control measures will be maintained until permanent vegetation is sufficiently established to prevent erosion.

#### **4.1 Straw Bale Barrier**

Straw bale barriers are a temporary sediment barrier consisting of a row of entrenched and anchored straw bales. Straw bale barriers will be placed in areas to detain small amounts of sediment from disturbed areas of limited extent in order to prevent sediment from leaving a construction site and to decrease the velocity of sheet flows. For this project, straw bale barriers will be installed and maintained as outlined in VESCH Standard and Specification 3.04. Appropriately sized containers or a lined/bermed staging area will be established with poly-sheeting and a perimeter of hay bales to accumulate screened hazardous waste respirator cartridges as they come out of the screening plant.

Straw bales will be removed upon satisfactory stabilization of disturbed ground surfaces following site restoration activities as described in Section 3.6.

#### **4.2 Temporary Stone Construction Entrance**

A stone construction entrance will be installed where the temporary access road meets Garrison Road as shown on Figure 2. The entrance will consist of a stabilized stone pad with a filter fabric under-liner. Stone construction entrances are used to reduce the amount of mud transported onto paved public roads by motor vehicles and runoff. Installation and maintenance will be conducted as outlined in VESCH Standard and Specification 3.02. Access road installation and construction entrance placement are discussed in Section 3.1.5. The construction entrance will be removed along with the access road at the completion of the project as described in Section 3.6.

In addition to the above, heavy equipment tracks and tires will not be routed through contaminated areas. Trucks will be routed in and out of the work area in accordance with the Traffic Plan (Figure 3).

### **4.3 Silt Fence**

Silt fences are a temporary sediment barrier consisting of synthetic fiber fabric stretched across and attached to supporting posts, which are entrenched. Their purpose is to intercept and detain small amounts of sediment from disturbed areas during construction operations in order to prevent sediment from leaving the site and to decrease the velocity of sheet flows and low-to-moderate level channel flows. For this project, silt fence will be installed around down-gradient perimeter of the excavation area, staging area where soil screening is being performed, and along each side of the haul road where it connects with Garrison Road. Silt fence will be installed in accordance with the guidance provided in VESCH Standard and Specification 3.05.

### **4.4 Dust Control**

Dust control is the minimizing of surface and air movement of dust during land disturbing and construction activities in order to reduce the presence of airborne substances which may present health hazards, traffic safety problems, or harm to animal or plant life. Dust control measures will be implemented during construction activities by spraying/misting water on to areas of disturbed earth and during soil and debris handling activities, including soil and debris excavation, screening, and transportation. Care shall be taken not to apply too much water such that ponding or run-off conditions are created. Dust control will be performed in accordance with the guidance provided in VESCH Standard and Specification 3.39. More information on dust control is included in the EPP, Section 6.0.

### **4.5 Permanent Seeding and Mulching**

Permanent seeding is the establishment of perennial vegetative cover on disturbed areas through the planting of seed. Mulching is the application of plant residues or other suitable materials to the soil surface. The combination of permanent seeding and mulching can help prevent erosion by protecting the soil surface from raindrop impact and reducing velocity of overland flow. A seasonally and regionally appropriate seed mixture will be applied to the disturbed areas of the site to promote quick and effective establishment of a permanent vegetative cover. Seeding will be accomplished by hand broadcasting or through the use of a manual seed spreader. Mulch will be then applied to the seeded areas to prevent erosion and foster vegetative growth. Seed and mulch application will be performed in conformance with VESCH Standard and Specification 3.32 and 3.35, respectively.

## **5.0 WASTE MANAGEMENT PLAN**

This WMP presents the practices and procedures to be followed to manage waste on-site and properly transport and dispose of wastes generated during the field activities.

This WMP identifies on-site waste management activities to be conducted such as waste characterization, waste accumulation and containerization, waste profiling, marking, and labeling of waste containers, as well as manifesting and off-site transport and disposal of contaminated material and recordkeeping requirements.

Another goal of this plan is to ensure that waste minimization practices are followed, to the extent practicable, to reduce the volume of waste that will be generated, stored, and removed from the site for disposal.

The Environmental Manager (described in the EPP) will have responsibility for oversight of waste management activities at the site, including, but not limited to, accurate identification and classification of contaminated waste and contaminated materials, determination (with Generator designation) of proper shipping names; identification of marking, labeling, packaging, and placarding requirements; completion of waste profiles, waste manifests, land disposal restrictions (LDRs), exception and discrepancy reports; and other waste management documentation, as required.

## **5.1 Regulatory Framework**

The NTCRA at Area 2 is being performed pursuant to the CERCLA. Under CERCLA Section 121(e), any response actions conducted entirely on site are exempt from the need to obtain federal, state, or local permits. According to 40 Code of Federal Regulations (CFR) 300.400(e), the term “on site” includes the areal extent of contamination and all suitable areas in very close proximity to the contamination that are necessary for implementation of the response action. On-site actions at CERCLA sites need only comply with the substantive aspects of environmental regulations and permits, and not with the corresponding administrative requirements.

Off-site activities such as waste transportation and disposal are not considered to be applicable or relevant and appropriate requirements (ARARs) and must comply with all applicable federal, state, and local regulations, not just substantive ones.

### **5.1.1 Applicable or Relevant and Appropriate Requirements for Waste**

The following provides a summary of the action- specific ARARs, as defined in the EE/CA that apply specifically to the on-site waste management activities TtEC will perform under this Task Order. The EPP contains a more comprehensive listing of ARARs that pertain to this project.

#### ***Accumulation of Hazardous Waste in Containers Onsite for Less than 90 Days, 9 VAC 20-60-262 only as it incorporates 40 CFR 262.34 (a) (1)(i), (2), (3)***

The following container management standards apply to hazardous waste:

- Hazardous waste must be stored in a container made of or lined with materials which will not react with, and is otherwise compatible with the waste to be stored.

- If a container holding hazardous waste is not in good condition or if it begins to leak, the hazardous waste in that container must be transferred to a container that is in good condition.
- A container holding hazardous waste must always be closed during storage, except when it is necessary to add or remove waste.
- The containers must be marked with the words “hazardous waste” and the accumulation start date.
- Areas where containers holding hazardous waste are stored must be inspected at least weekly for container deterioration caused by corrosion or other factors.
- Containers holding ignitable or reactive waste must be located at least 15 meters (50 feet) from the facility’s property line.
- Incompatible wastes and materials must not be placed in the same container nor placed in an unwashed container that held an incompatible waste or material.

***Accumulation and/or treatment of hazardous waste in staging piles onsite, 9 VAC 20-60-264 only as it incorporates 40 CFR 264.554(d)(1)(ii), (d)(2), (j)(1), (j)(2)***

This requirement is only applicable if the respirator cartridges (currently anticipated to be hazardous waste for lead and cadmium based upon existing sample data) are temporarily accumulated onsite in staging piles rather than containers (e.g., rolloffs). If staging piles are used for temporary staging of hazardous waste, they will be constructed and maintained to prevent the migration of hazardous constituents to other media. The design must consider location, hydrogeology, and any other factors that may reasonably influence the migration of hazardous constituents.

## **5.2 Specific Training Requirements**

Specific regulatory training requirements for hazardous waste personnel (if hazardous waste is generated) and “hazmat employees” (if hazardous materials or hazardous substances are generated) are published in federal and state regulations. Training is required by CFR Titles 40 and 49 for people that handle, package, stage, transport, consolidate, treat, or dispose of waste. Training certificates for employees dealing with hazardous materials/waste materials will be maintained at the project site and will be available for review upon request.

### **5.2.1 Waste Management Awareness Training**

Personnel working on this project, including subcontractors will be briefed on the requirements of this WMP during site orientation. Training will be by the Environmental Manager, who is trained in RCRA generator requirements and Department of Transportation (DOT) hazmat employee requirements. In addition, the Environmental Manager will complete the Environmental Compliance, Assessment, Training, and Tracking System (ECATTS) Training Module.

### 5.2.2 Department of Transportation Hazardous Material Employee Training

The Environmental Manager and subcontractor employees who meet the definition of a hazmat employee, and their supervisors will be trained, tested, and certified in accordance with 49 CFR 172, Subpart H, including general- and function-specific training, safety training, and security awareness. Training is required for persons who perform tasks such as selecting DOT packaging, placing DOT markings and labels on packages, or preparing and/or signing shipping papers for DOT regulated material/including waste. This training is required initially and then every 3 years thereafter.

### 5.3 **Summary of Wastes to Be Disposed**

The majority of project wastes are anticipated to be characterized as non-hazardous waste; however, all waste must be properly characterized, at the point of generation, in a representative manner to make this determination and some hazardous waste is anticipated.

The anticipated waste disposal sampling requirements are included in the descriptions for each waste stream below, when required. The disposal facility will also be contacted to determine the required analytical and sampling requirements for each waste stream to be profiled, as they may be more stringent than identified below.

TtEC will manage the following waste materials for proper disposal:

- A. Respirator cartridges (currently anticipated to be hazardous waste)
- B. Excavated and screened soil and debris, including drum debris
- C. Decontamination water (personnel and/or equipment decontamination)
- D. Clean construction debris (miscellaneous wood, dunnage, cardboard, etc.)
- E. General trash (office and lunch room waste).
- F. Sanitary waste (portable toilet and hand washing facilities).
- G. Vegetation (trees and brush from vegetation and tree removal operations)

#### 5.3.1 Unanticipated waste discovery

If suspected or unknown waste is found during excavation and screening activities (e.g., drums or containers with unknown content, unidentified cylinders, etc.), TtEC will immediately notify the Contracting Officer and the PM. TtEC will not disturb/investigate this material until authorized by the Contracting Officer and relevant environmental, health, and safety plans have been updated and approved to address proper handling and investigation of the material.

### 5.4 **Waste Characterization Sample Requirements**

When sampling is required for a waste stream, representative samples of the waste will be obtained and analyzed at an off-site laboratory. Samples will generally be analyzed for the anticipated or known site contaminants plus additional analytical as required by the disposal facility.

The Project Chemist or the Corporate Compliance Manager will assist the Environmental Manager in making sampling and analytical decisions as necessary. In some cases, total results will be requested for waste characterization, however, it is likely prudent to request TCLP analysis up front. For totals results on a solid material, a TCLP may be requested if/when the 20 times rule is exceeded for any RCRA regulated COPC. The Environmental Manager will evaluate sample results to determine preliminary characterization and profiling requirements. The Hazardous Waste Media Manager will review the sample results to make the Navy's waste determination.

The following sections describe the anticipated waste streams and the anticipated disposition that will be required as well as the anticipated waste characterization sampling requirements. All waste designation and disposition instruction will be by the Generator (designated Navy Representative) through signature.

#### 5.4.1 Respirator Cartridge Canisters

The respirator cartridge canisters were previously sampled and sample results indicated that the cartridges failed the TCLP for lead and cadmium. Since these samples are older and the sampling representativeness is not known, TtEC plans to sample the cartridges for disposal characterization purposes. Cartridges will be sampled in a representative manner prior to beginning excavation (in situ) at the same time that soil is sampled "in situ" as described in Section 5.4.2 below. If the results confirm that the cartridges are hazardous waste (cadmium, lead, or other toxicity characteristic), they will be managed as a RCRA hazardous waste. The disposal facility will be contacted to determine if any additional sampling for profiling purposes is required; however TtEC plans to sample the cartridges for the parameters listed in Section 3.5.2.

If the canisters are a hazardous waste based on sample results, they will have the anticipated proper shipping description (to be verified during the profiling process):

"NA3077, Hazardous Waste, Solid n.o.s. (x,y), 9, PGIII RQ (D008, D006)"

The "x" and "y" and "D008, D006" above are anticipated to be cadmium and lead as previously identified during prior sampling of these cartridges; however TtEC sample results will be used to determine the hazardous waste characteristics. It is anticipated that if the cartridges are confirmed to be a hazardous waste, the waste will be suitable for disposal at the US Ecology Hazardous Waste facility in Michigan, a licensed RCRA subtitle C disposal facility. If not a hazardous waste, it is anticipated that the cartridges will be disposed of at the SPSA Regional Landfill in Suffolk, VA along with the excavated soil and debris described in Section 5.4.2.

#### 5.4.2 Excavated and Screened Soil and Debris

Two soil samples will be collected in a representative manner from soil "in situ" before full excavation is performed with the assistance of a mini-excavator. Samples will be analyzed at a qualified laboratory. Analytical methods will be determined by the disposal facility's acceptance criteria, but are expected to include the parameters indicated in Section 3.5.2.

Nonhazardous soil and associated nonhazardous debris (empty or broken glass dextrose bottles, miscellaneous wood, metal, used poly or geosynthetic liner from soil or debris stockpiles, used personal protective equipment and sampling scoops, etc.) will be disposed of off-site at an approved RCRA Subtitle D (nonhazardous waste) landfill, anticipated to be the SPSA Regional Landfill in Suffolk, VA.

In the unlikely event hazardous waste soil (e.g., soil fails the TCLP for a RCRA toxicity characteristic) is generated, the soil will be disposed off-site at an approved RCRA Subtitle C disposal facility.

Empty metal drums may be flattened and, if free from adhering soil and/or visible staining, may be segregated for recycling at a scrap metal recycling facility.

Soil and debris associated with the soil excavation and handling to be disposed of off-site will be shipped in suitably sized lined roll-off bins or dump trucks with covers (tarps or hard tops).

#### 5.4.3 Decontamination Water

Decontamination water may be generated from decontamination of equipment that has become contaminated by contact with soil if dry decontamination methods (brushing off or wiping down) are not sufficient to remove visible contamination from surfaces (e.g., heavy equipment buckets), which is the preferred method to use when possible to minimize waste generation. In addition, decontamination water may be generated for decontamination of personnel if non-disposable personal protective equipment is worn (e.g., boot wash). The amount of decontamination water is not anticipated to be more than five, 55- gallon drums. Decontamination water is anticipated to contain low levels of the site COPCs and small amount of biodegradable detergent (e.g., Alconox™) and is anticipated to be nonhazardous waste.

The drummed decontamination water will be sampled (one composite sample from up to 5 drums) and analyzed per the disposal facility's acceptance criteria, but are expected to include the parameters listed in Section 3.5.2.

##### 5.4.3.1 *Clean Construction Debris*

Clean construction debris (construction debris that generally has not had contact with contaminated materials) may consist of miscellaneous wood, dunnage, cardboard, etc. used during construction or packaging during delivery of materials. TtEC will segregate and recycle this debris as appropriate or, if not recyclable, will dispose of it as general trash as described below.

#### 5.4.4 General Trash

General trash (e.g., paper material, plastic cups and bags, trash bags, food waste) will be bagged and placed into an on-site TtEC dumpster that is in good condition. No contaminated site waste will be commingled with this waste stream. The dumpster will be kept closed unless actively adding waste and will be serviced on a weekly basis by a solid waste vendor for disposal at a municipal solid waste landfill.

TtEC will segregate and recycle aluminum cans, plastic or glass bottles, cardboard, and paper to the extent practicable to minimize the volume of municipal solid waste generated in this waste stream.

#### 5.4.4.1 *Sanitary Waste*

A sanitary waste vendor will service portable toilet and hand washing stations on a weekly (or more frequent) basis. Sanitary waste will be disposed of off-site by the vendor at an approved sanitary waste treatment facility.

#### 5.4.5 Vegetation

Trees removed during vegetation removal tasks, including associated brush and/tree limbs will be staged for the Base to pick up and/or will be chipped and used as mulch on site.

### 5.5 **Waste Accumulation Areas**

#### 5.5.1 Hazardous Waste Accumulation Areas

TtEC will implement the following hazardous waste storage area requirements if hazardous wastes are generated. Installation-specific instructions for hazardous waste accumulation may also be required and will be incorporated as directed through the FEAD or Navy Technical Representative (NTR) / Remedial Project Manager (RPM).

- During the mechanical screening process, TtEC will either construct a lined/bermed staging area with poly-sheeting and hay bales as a temporary staging pile or will use appropriate sized containers (ie...drums, roll-off boxes) to contain hazardous waste respirator cartridges as they are sorted from soil and other debris. When not in active use, this staging pile will be covered with a suitable cover.
- TtEC will manage hazardous waste containers in a specific area within the staging area clearly segregated from nonhazardous waste storage.
- Appropriate signage will be placed to warn of hazardous wastes.
- Aisle space (36-inch minimum) will be maintained to allow unobstructed movement of personnel, fire-protection equipment, spill-control equipment, and decontamination equipment to any area of facility operation in an emergency, unless aisle space is not needed for any of these purposes.
- Although accumulation time for CERCLA projects is an administrative requirement, in general, hazardous waste will be shipped off-site within 90 days of generation.
- The following emergency equipment will be located or available to personnel during active waste management activities at each accumulation area:
  - A hand-held two-way radio, capable of summoning emergency assistance
  - Portable fire extinguishers, fire control equipment, spill control equipment, and decontamination equipment

- A spill-response kit for minor spills to include a shovel, adsorbent pads and/or “kitty litter,” and a collection container

#### 5.5.1.1 Containers used for hazardous waste accumulation

TtEC will only use containers that are in good condition and compatible with the waste placed within. Liquid waste in containers (e.g., drums) will have sufficient freeboard to allow outage for expansion. Containers used to transport solids will be sift-proof. TtEC will ensure containers are closed or properly covered, except when adding or removing waste and are properly secured to prevent tampering or unauthorized access. TtEC will inspect containers for signs of deterioration and will be responsible for correcting deficiencies found during inspection.

#### 5.5.1.2 Marking and Labeling during Hazardous Waste Accumulation

TtEC will immediately mark all hazardous waste containers with the words “hazardous waste” and other information required by 40 CFR 262, Section 32, as soon as the waste is containerized. Labeling on containers will be individually coded to allow positive identification and coordination with laboratory analytical data.

TtEC will mark each container of hazardous waste of 110 gallons or less with the following:

HAZARDOUS WASTE Federal Law Prohibits Improper Disposal.

If found, contact the nearest police or public safety authority or the

U.S. Environmental Protection Agency.

Generator's name \_\_\_\_\_

#### 5.5.1.3 Hazardous Waste Accumulation Area Inspections

Documented inspections of hazardous waste accumulation areas will be conducted and recorded weekly (every 7 calendar days) using the NAVFAC Hazardous Waste Accumulation Area inspection form (Appendix B). Inspection logs will contain date and time of inspection, name of individual conducting the inspection, problems noted, and corrective actions taken.

The Environmental Manager or his/her qualified designee will conduct the inspections. Hazardous waste accumulation area(s) will be inspected to ensure the following:

- The containers will be checked for good condition. If a container is not in good condition or appears to be leaking, the waste will be transferred to another container.
- All containers used will be checked to be sure that they are made of material that will not react with, and are otherwise compatible with, the hazardous waste placed within.
- The containers will be checked to ensure that they remain closed at all times, except when adding or removing waste.
- The container label will be checked to ensure that it is filled out properly and to check the waste accumulation start date.

### 5.5.2 Nonhazardous Waste Accumulation Areas

No prescribed markings or emergency equipment are required for nonhazardous waste accumulation areas. The general accumulation requirements for nonhazardous wastes include storage in a manner that does not lead to spread of contamination to adjacent areas or the addition of unauthorized waste to the waste stream, clear segregation of nonhazardous waste from hazardous waste, and the addition of hazard communication information on the container such as signs or labels or writing to indicate the contents of the container. Nonhazardous wastes will not be stored in hazardous waste storage areas unless clearly segregated.

## **5.6 Transportation and Waste Disposal Requirements**

Elements of off-site transportation and waste disposal include disposal facility and transporter selection, waste loading and transportation, including recordkeeping. The following subsections present transportation and disposal requirements for project wastes that will be transported from the site.

### 5.6.1 Waste Profiles

Waste profiles will be prepared for contaminated waste streams (hazardous as well as nonhazardous). Waste profiles will not be required for general trash, clean construction debris, sanitary waste, or vegetation.

Profiles must be representative of the whole waste stream that will be disposed of under that profile. Profiles will be prepared or reviewed by the Environmental Manager and signed by the Generator's Representative before they are sent to the disposal facility for approval.

Profiles will be prepared specific to the particular disposal facility and will contain process information, characterization decisions, including proper shipping description, waste composition, and analytical data and/or generator knowledge that is representative of that particular waste stream. TtEC will use 49 CFR 172, Section 101, to identify proper shipping description for each hazardous material or substance (including any hazardous wastes) to be shipped off site.

### 5.6.2 Disposal Facility and Transporter Selection

Prior to using a disposal facility for contaminated waste disposal, TtEC will contact the EPA Regional Off Site Coordinator specified in 40 CFR 300, Section 440, to determine the facility's status and document all information necessary to satisfy the requirements of the EPA CERCLA Off Site Policy. The disposal facility must have all required permits and be operating in compliance with permit conditions. For hazardous waste, the facility must have an EPA identification number.

In addition, the contaminated waste transportation subcontractor will have all appropriate licenses, permits, and registrations appropriate to the type of waste being shipped, including an EPA identification number (when required).

### 5.6.3 Land Disposal Restriction

For RCRA-regulated hazardous waste, the nature of the underlying hazardous constituents and the facility-specific treatment authorizations will be determined. The waste either meets the treatment requirements of 40 CFR Part 268 or must undergo treatment (numeric or performance based standards of treatment) to meet the 40 CFR Part 268 treatment levels.

A LDR form will be filled out by the Environmental Manager or disposal facility and will be signed by the Generator, and submitted to the intended disposal facility for any waste stream that is RCRA hazardous waste.

The signed LDR certification will accompany any shipments of RCRA-hazardous waste to the disposal facility (at least the first load of each hazardous waste stream). The disposal facility must be notified prior to sending the waste. Copies of LDRs will be provided to the FEAD or NTR/RPM for signature and approval by the Generator's representative and will be maintained in the project file with the profile sheets.

### 5.6.4 Packaging

TtEC will provide bulk and non-bulk containers (as appropriate) for packaging hazardous material or substances (including hazardous waste) consistent with the authorizations referenced in the Hazardous Materials Table in 49 CFR 172, Section 101, Column 8. Bulk and non-bulk packaging will meet the corresponding specifications in 49 CFR 173 referenced in the Hazardous Materials Table, 49 CFR 172, Section 101. Each packaging will conform to the general packaging requirements of Subpart B of 49 CFR 173, to the requirements of 49 CFR 178 at the specified packing group performance level, and to the requirements of special provisions of Column 7 of the Hazardous Materials Table in 49 CFR 172, Section 101 and will be compatible with the material to be packaged as required by 40 CFR 262.

### 5.6.5 Marking and Labeling for Transportation

TtEC will provide markings for each hazardous material/waste package, freight container, and transport vehicle consistent with the requirements of 49 CFR 172, Subpart D, 40 CFR 262, Section 32 (for hazardous waste).

TtEC will provide primary and subsidiary (if required) labels and placards for hazardous materials/wastes consistent with the requirements in the Hazardous Materials Table in 49 CFR 172, Section 101, Column 6. Labels and placards will meet design specifications required by 49 CFR 172, Subpart E, including size, shape, color, printing, and symbol requirements. Labels and placards will be durable and weather resistant and capable of withstanding, without deterioration or substantial color change, a 180-day exposure to conditions reasonably expected to be encountered during container storage and transportation.

## **5.7 Shipping documents**

### **5.7.1 Hazardous Waste Manifest**

TtEC will use uniform hazardous waste manifests for transporting hazardous wastes as required by 40 CFR 263. Transportation shall comply with all requirements in the DOT referenced regulations in the 49 CFR series. TtEC will prepare hazardous waste manifests for each shipment of hazardous waste shipped off site. Manifests will be completed using instructions in 40 CFR 262, Subpart B. Manifests and waste profiles shall be submitted to the FEAD or NTR/RPM for review, approval, and signature by the Generator's representative.

The signed terminal (original) copy of a hazardous waste manifest must be received by the generator no later than day 35 after shipment. If it is not, the exception reporting requirements will be initiated, which includes tracking of the status and location of the waste and potentially preparation of an exception report.

Once a hazardous waste manifest has been signed by the Generator's Representative, changes to will not be made to the information (e.g., designated transporters, receiving facility, proper shipping description, etc.) on the manifest without Generator approval in advance.

### **5.7.2 Nonhazardous Waste Manifests and Weight Slips**

Nonhazardous waste transported from the site will be accompanied by a nonhazardous waste manifest. TtEC will forward the manifest to the Generator's representative (through the FEAD or NTR/RPM) for review and signature. The Generator's Representative will be responsible for reviewing and signing all waste documentation, including waste profiles and manifests.

### **5.7.3 24-Hour Emergency Number for Shipping Document**

An emergency response number of a person knowledgeable about the hazardous materials being shipped and who has comprehensive emergency response and incident mitigation information and is available 24-hours per day must be listed on all hazardous waste as well as any DOT-regulated nonhazardous waste shipping documents (e.g., if a waste is an environmentally hazardous substance).

For hazardous waste and nonhazardous waste that is a hazardous substance (if designated), this emergency number will be provided by the Generator for inclusion on the manifest. Alternatively, the disposal facility may provide their 24-hour emergency number for inclusion on the manifest.

### **5.7.4 Weight Determination**

If an on-site truck scale is not available, transporters with built-in calibrated scales will be used or another source to weigh trucks will be determined to ensure that DOT weight restrictions are not exceeded and to provide accurate weights for all waste manifests when required (hazardous waste).

It will be the dual responsibility of the Environmental Manager and the transportation subcontractor to document truck weights before trucks exit the site.

Waste hauling trucks carrying hazardous waste will be lined and covered with tarps prior to leaving the site.

## **6.0 ENVIRONMENTAL PROTECTION PLAN**

This EPP identifies the applicable environmental protection measures to be implemented throughout the course of the fieldwork for the NTCRA at AOC 2. This EPP describes the measures to be implemented to protect land resources, water resources, air resources, and fish and wildlife resources. BMPs that TtEC will implement to maintain effective environmental protection of these resources during the project are also included in this EPP.

In addition to this EPP, TtEC has prepared a WMP, Section 5.0 of this Work Plan, which details how TtEC will manage and properly dispose of project wastes and an ESCP, Section 4.0 of this Work Plan, which details how TtEC will implement stormwater pollution prevention and erosion control measures during construction.

### **6.1 Environmental Manager**

The TtEC Project Superintendent is the project Environmental Manager and is responsible for the implementation of this EPP and to oversee compliance on this project.

The Environmental Manager will have a minimum of five years construction experience with environmental procedures similar to those of this project, familiarity with Environmental Management Systems, and familiarity with environmental regulations applicable to construction operations. The Environmental Manager will be supported by TtEC's Senior Environmental Compliance Manager, Jennifer Peters, when required.

The Project Environmental Manager is responsible for:

- Compliance with applicable federal, state, and local environmental regulations including maintaining required documentation.
- Implementation of the WMP.
- Implementation of the ESCP.
- Implementation of this EPP.
- Environmental training for project personnel in accordance with their position requirements.
- Monitoring and documentation of environmental procedures.

### **6.2 Required Environmental Training**

The Project Superintendent/SSHO will review this EPP as well as the ancillary plans (WMP and ESCP) referenced in this EPP with project personnel so that personnel are familiar with its

requirements for environmental protection, including spill prevention and reporting, waste management, and stormwater pollution prevention.

The WMP contains information on additional training requirements pertaining to waste management, transportation, and disposal.

### **6.3 Regulatory Framework**

The removal action at AOC 2 is being performed pursuant to the CERCLA as a NTCRA. Under CERCLA Section 121(e), any response actions conducted entirely on-site are exempt from the need to obtain federal, state, or local permits. According to 40 CFR 300.400(e), the term “on-site” includes the areal extent of contamination and all suitable areas in very close proximity to the contamination that are necessary for implementation of the response action. On-site actions at CERCLA sites need only comply with the substantive aspects of environmental regulations and permits, and not with the corresponding administrative requirements.

Applicable requirements are those requirements specific to AOC 2 that satisfy all jurisdiction prerequisites of the law or requirements. Relevant and appropriate requirements are those that do not have jurisdiction authority over the particular circumstances at AOC 2, but are meant to address similar situations, and therefore are suitable for use at AOC 2. Federal ARARs are determined by the lead agency, which in this case is the Navy. As outlined by 40 CFR 300.415(j), the lead agency may consider the urgency of the situation and the scope of the removal action to be conducted in determining whether compliance with ARARs is practicable.

This EPP describes the measures that will be taken onsite to comply with substantive requirements of federal and state ARARs and permits.

Off-site activities such as waste transportation and disposal are not considered to be ARARs and must comply with all applicable federal, state, and local regulations, not just substantive ones. Waste-related ARARs and regulatory requirements are included in the WMP.

The USEPA and the VDEQ are the regulatory agencies involved in this project with the Navy as the lead agency.

#### **6.3.1 Applicable or Relevant and Appropriate Requirements**

The following provides a summary of the action- and location-specific ARARs, as defined in the EE/CA that apply specifically to the scope of work TtEC will perform under this Task Order. No chemical-specific ARARs have been identified in the EE/CA; however the EE/CA presents the cleanup levels for this project based on human health and ecological risk based screening results.

#### ***Migratory Bird Treaty Act, 16 United States Code (U.S.C.) 703***

Applicable because the project site is located in the Atlantic Migratory Flyway. If migratory birds, or their nests or eggs are identified at the site, operations will not destroy the birds, eggs, or nests (result in a take).

***Coastal Zone Management Act, 15 CFR 930.33(a)(1), (c); .36(a), (b); .39(b)(c)***

Applicable to activities at Area 2 that will affect Virginia’s coastal zone. Activities must be consistent to the maximum extent practicable with Virginia’s enforceable policies. Consistency determination will be done by the Navy as the federal agency through coordination with the Virginia Coastal Zone Management agency for substantive compliance with this Act.

***Design Requirements for Closure of Solid Waste Sites; 40 CFR 258.60(a)***

Requirements are relevant and appropriate because there are no provisions for open dumps in the state of Virginia that apply to open dumps. These requirements are not applicable to facilities that did not receive waste after 1991. The project is being performed to meet this ARAR through removal of waste, confirmation sampling to ensure cleanup requirements in the EE/CA are met, and backfilling of the site with clean fill.

***Virginia Stormwater Management Regulations 4 Virginia Administrative Code (VAC) 50-30-40(1); (2); (3); (4); (17); (18); (19)(h), (i) and 4 VAC 50-60-300 (4), 310(A), 310(B), 380(A)(8)(2), 380(B)(1), 420, 1170, 1180, 1182, and 1186***

These requirements are relevant and appropriate to project activities. The project activities will not disturb 1 acre or more of land; however erosion control measures will be implemented during construction activities to protect down-gradient unnamed tributary and wetlands from stormwater pollution. BMPs will be implemented during construction as specified in the ESCP.

***Fugitive Dust Control, 9 VAC 5-50-90***

Applicable because soil and debris handling may generate dust. Dust control measures will be implemented during soil and debris handling activities where particulates may become airborne.

## **6.4 Chemical Inventory and Control**

Consistent with the requirements of Section 311 of the Emergency Planning and Community Right-to-Know Act, TtEC will maintain an inventory of chemicals and hazardous materials brought onsite.

TtEC will obtain material safety data sheets (MSDS)/ Safety Data Sheets (SDS) for any hazardous materials (e.g., gasoline, spray paint, 2-cycle oil, and others, if required.) that TtEC uses on the project as well as anticipated quantities required to perform the tasks. In addition, TtEC will request the same from any subcontractors.

TtEC will perform the following activities:

- Train employees on proper use and storage of hazardous materials.

- Confirm that the inventory of chemicals brought on the site by TtEC and its' subcontractors is available and maintained current along with MSDS/SDS.
- Label hazardous material containers with the identity of the chemical and with hazard warnings, as applicable in accordance with hazard communication standards.
- Use material in accordance with manufacturer's intended purpose.
- Store hazardous material in a controlled and contained manner to prevent releases.
- Provide inventory to local emergency planning commission (if thresholds of material on-site meet or exceed reporting thresholds) and to the Navy and/or CAX Environmental Department upon request.

## **6.5 Waste Transportation and Disposal**

Waste transportation and disposal requirements and best practices are described in Section 5.0 (Waste Management Plan).

## **6.6 Protection of existing resources**

The following sections detail various strategies to protect natural resources, landscape features, air quality, fish and wildlife, and water quality.

There are no known historical, cultural, or archaeological resources that will be impacted by the NTCRA and the associated regulations were not identified as ARARs in the EE/CA, so no measures have been included to protect these resources.

## **6.7 Land Resources and Damaged Landscape Features**

TtEC will implement appropriate measures to protect natural resources from damage during the NTCRA.

A survey will be performed during mobilization to document existing conditions and to locate and mark the areas to be excavated.

TtEC will stay within the limits of the work area identified for completion of this work, will stay out of designated wetlands and will not perform more landscape or tree disturbance/removal than is required to safely and efficiently conduct the scoped fieldwork.

The minimal tree clearing required at Area 2 of AOC 2 is not anticipated to impact the nearby Colonial Parkway view shed. However, if additional tree clearing is necessary that may impact the view shed, TtEC will notify the Navy and other pertinent parties prior to doing so.

### **6.7.1 Protection of Air Quality**

Construction activities will be kept under surveillance through daily inspections and management to control to minimize the discharge of air pollutants and fugitive dust emissions.

Although the field activities will likely result in minimal discharge of air pollutants, the following practices will be implemented to protect air quality from operating construction equipment and fugitive dusts, which, if allowed to migrate, often carry pollutants from the COPCs (e.g., chromium, arsenic, mercury, Aroclor-1260, 4,4-DDT) if present in the soil and debris. The dust itself, along with COPCs can present a potential exposure hazard to workers as well presenting a source of contamination to the environment if allowed to migrate out of contaminated areas.

The following measures will be performed to protect air quality during the remedial action:

- Construction equipment will be maintained within manufacturer's design limits to ensure minimal discharge of exhaust emissions. Installed pollution control devices will not be removed, altered, or bypassed.
- Good housekeeping practices will be employed to keep roadways and other areas clean and free from accumulated waste (including soil and debris) which, when dry, could become sources of fugitive dust emissions or contaminants that can be dispersed via stormwater.
- Waste bins and stockpiles of soil and respirator cartridges will be kept covered or closed when not in active use or accumulation.
- Burning is not allowed as a means of clearing.
- Dust controls will be applied in areas where dry soil and debris is being excavated, screened, loaded, and transported. Water mist will be applied in sufficient quantity to prevent creation of dust, but excessive watering that may result in ponding or mud that may be transferred to the haul roads will not be permitted.
- Staged soil and debris not covered (e.g. during active screening operations) will be sufficiently wetted necessary to minimize fugitive dust generation.
- Appropriate containers or a lined/bermed staging pile area with poly-sheeting and hay bales at the perimeter will be established to accumulate screened hazardous waste respirator cartridges.
- Traffic routes will be designated and maintained in accordance with the Traffic Control Plan in the Work Plan to maintain routes and provide controls on incoming and outgoing vehicles and construction equipment.
- Travel speeds over unpaved areas will be limited to reduce dust levels.
- Equipment will be operated in a manner to minimize airborne particulates whenever possible (e.g., the drop height of excavators to load level will be limited).

#### 6.7.2 Protection of Water Resources

Controlling stormwater run-on and run-off and preventing erosion and sedimentation is the primary water resource concern during construction activities. Various temporary and permanent erosion controls will be used as outlined in Section 4.0 (ESCP). Disturbance of wetland areas will be avoided and it is not anticipated that wetlands will be encountered or impacted during removal action activities.

### 6.7.3 Protection of Wildlife Resources

TtEC will adhere to the following during the NTCRA:

- TtEC will not capture, collect, feed, harass, or otherwise intentionally harm or kill any wildlife including migratory birds (including disturbance of eggs or nests) or snakes during field activities.
- TtEC will stay out of and keep equipment out of wetlands unless specifically authorized for entry to implement the remedial action.
- If an animal becomes a nuisance which could endanger the safety of workers, TtEC will notify the Navy and a representative from a fish and wildlife agency will be contacted to handle the animal.

### 6.8 Noise

TtEC will conduct work within relatively normal operating hours anticipated to be from 7 a.m. to 7 p.m. Noise levels will be commensurate with adjacent noise levels for ongoing CAX operations and there are no residential or commercial businesses in the immediate area that could be impacted by noise.

TtEC will not remove, alter, or bypass equipment noise dampening equipment such as mufflers or shielding on engine compartments. When possible, generators and pumps will be whisper quiet or will be shielded to minimize noise generation and exposure.

### 6.9 Spill Prevention, Spill Containment and Control, and Spill Reporting

#### 6.9.1 Spill Prevention

The following details how TtEC will minimize the potential for spills onsite:

- Construction equipment (e.g., excavators, loaders, trucks, and screening plant) used on this project will be in good working condition at the time of mobilization and will undergo required preventative maintenance as recommended by the manufacturer. The Project Superintendent/SSHO will conduct a pre-mobilization inspection of equipment. Daily inspections will be performed on work vehicles and heavy equipment by the operator. Deficiencies such as leaking or worn fittings or hoses that could leak will be taken out of service and repaired.
- Daily informal (logbook) site inspections and weekly formal (inspection forms contained in the APP) will take place looking at housekeeping, material storage areas, and site operations as well as safety hazards. Corrective actions will be taken as appropriate and will be documented.
- Fuel and hazardous material storage areas onsite will be in a secure location and protected from contact with heavy equipment contact and prevented from contact with precipitation.
- Fuel tanks shall be secondary contained or otherwise bermed to prevent releases. The bermed volume shall be equal to the full capacity of the container/tank, at a minimum.

- Hazardous materials will only be brought onsite in quantities that are immediately required for use during work tasks.
- Hazardous materials will be kept in their original containers whenever possible and will be kept closed when not actively being used.
- Fuel containers (small metal Underwriter’s Laboratory-listed cans) will be stored within a properly rated fire cabinet within secondary containment and not exposed to rain.
- Refueling of trucks and heavy equipment will be performed over a secondary containment structure (bucket or kiddie pool with sorbent pads) in case of accidental overflow.
- Operators performing refueling tasks will not be performing other tasks and will be present at the dispensing nozzle at all times during fueling.
- A visual means of overfilling tanks will be provided and the operator will be able to shut down the flow prior to overfilling the tank.
- Good housekeeping procedures will be followed throughout the site at office and break room locations, temporary storage areas, and active work sites.

#### 6.9.2 Spill Containment and Control

Spill control materials (spill kits) will be maintained in the support zone for active work locations and at fuel storage and dispensing locations.

Incidental spills in secondary containment will be contained with sorbent pads, sorbent booms, or other sorbent materials such as kitty litter as well as nitrile gloves and plastic waste bags. Materials for spill containment will be present in sufficient quantity and type to immediately respond to a non-emergency spill situation that could reasonably occur during the removal action activity being performed in the area (e.g., hydraulic hose rupture on equipment, small overfilling of a fuel tank, etc.). Additional quantity of spill response equipment (to replenish or supplement stock if depleted during a response) will be available in an accessible location within the supply yard as required.

#### 6.9.3 Spill Response and Reporting

Detailed spill response and reporting procedures are provided in the APP. The general procedures for spill response are as follows:

- Assure personal safety, then evaluate the area and nature of the spill.
- Identify the source and stop the flow of pollutants, if it can be done safely.
- Contain the spill with absorbent materials or by berming the area.
- Remove and contain the spilled material, contaminated media, and cleanup material, and transport to a designated location for collection of such material.
- Contact the appropriate personnel listed in the APP.
- Record pertinent facts.

### **7.0 PROJECT QUALITY CONTROL PLAN**

The PQCP is provided in Appendix C.

## **8.0 SAMPLING AND ANALYSIS PLAN**

The SAP is provided in Appendix D.

## **9.0 ACCIDENT PREVENTION PLAN**

The APP is provided in Appendix E.

## **10.0 REFERENCES**

CH2M Hill. 2015. Draft Engineering Evaluation and Cost Analysis for Area of Concern 2 – Dextrose Dump, Naval Weapons Station Yorktown Cheatham Annex, Williamsburg, Virginia. January.

DoN. 2015. Statement of Work for Removal Action at AOC 2 at Naval Weapons Station Yorktown, Cheatham Annex, Williamsburg, Virginia. February.

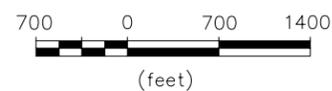
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## **FIGURES**

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**SITE LOCATION**



**FACILITY LOCATION**  
NTS

**LEGEND**

— NAVAL WEAPONS STATION BOUNDARY



REMOVAL ACTION AT AOC 2

**FIGURE 1**

FACILITY AND SITE LOCATION MAP  
NAVAL WEAPONS STATION, YORKTOWN-CHEATHAM ANNEX  
WILLIAMSBURG, VIRGINIA

REVISION: —  
AUTHOR: A.CRABTREE  
PROJECT NO:  
FILE: SEE BELOW



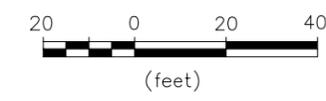
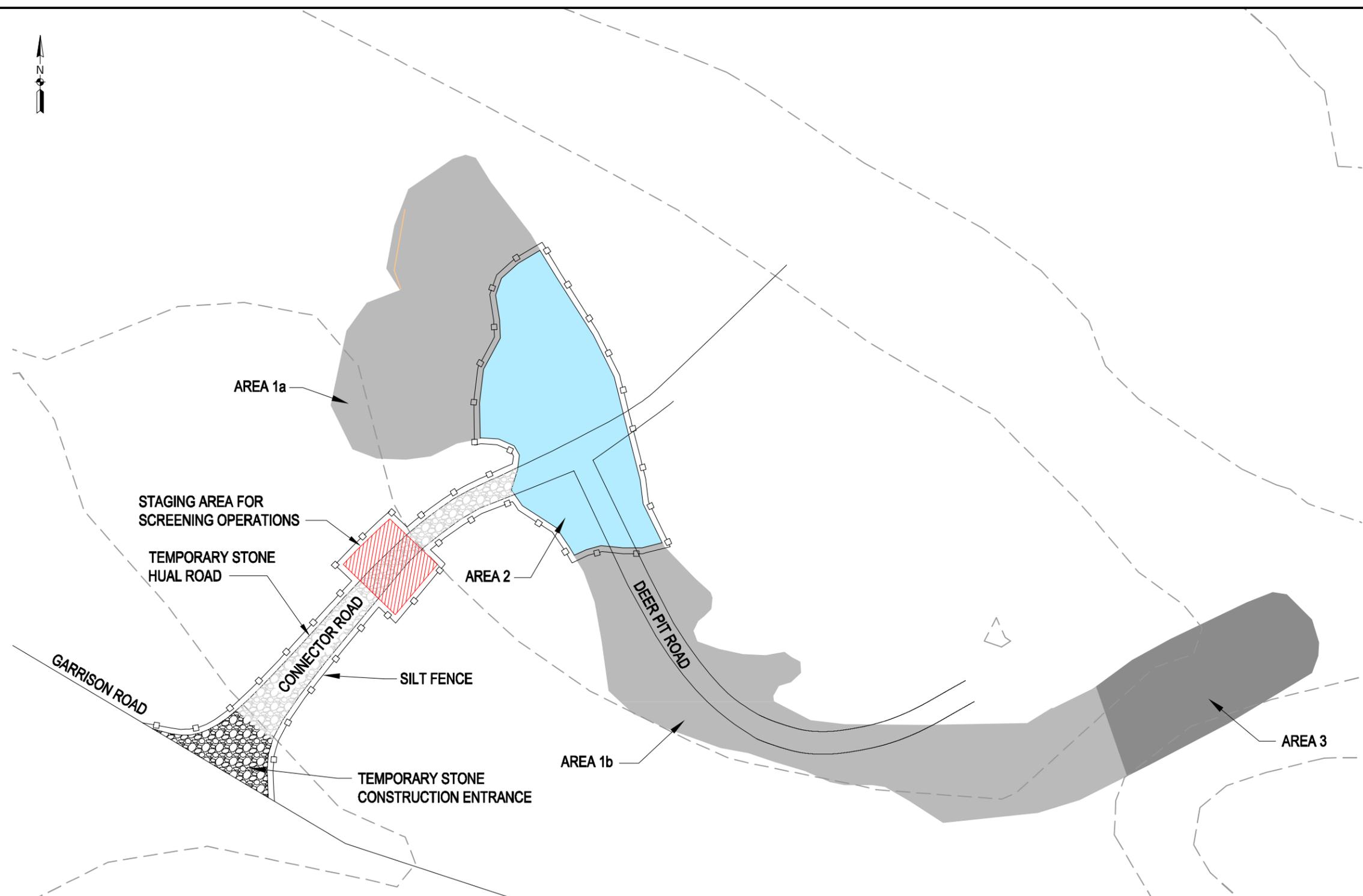


**NOTES:**

1. E&S CONTROLS WILL BE INSTALLED PER SECTION 4 OF THE RAWP.
2. SILT FENCE WILL BE INSTALLED AROUND THE DOWN-GRADIENT PERIMETER OF THE EXCAVATION AREA, AROUND THE SOIL SCREENING AREA, AND ALONG EACH SIDE OF THE HAUL ROAD WHERE IT CONNECTS WITH GARRISON RD. EXACT LAYOUT OF SILT FENCE WILL BE FIELD-DETERMINED.
3. DUST CONTROL MEASURES WILL BE IMPLEMENTED BY SPRAYING/MISTING WATER, AS NEEDED.
4. PERMANENT E&S CONTROLS INCLUDE SEEDING AND MULCHING ALL AREAS OF DISTURBANCE, TO BE COMPLETED DURING SITE RESTORATION.
5. THE PROPOSED LOCATION FOR THE SUPPORT AREA IS NEAR THE INTERSECTION OF GARRISON ROAD AND SANDA AVE. PENDING NAVY APPROVAL.
6. THE SUPPORT AREA WILL BE DETERMINED BY THE FEAD AT THE PRECONSTRUCTION MEETING.

**LEGEND:**

- 5FT CONTOURS
- SILT FENCE
- AREA 1a AND 1b BOUNDARY
- AREA 2 BOUNDARY
- AREA 3 BOUNDARY
- ▨ STAGING AREA FOR SCREENING OPERATIONS
- ▨ TEMPORARY STONE CONSTRUCTION ENTRANCE



REMOVAL ACTION AT AOC 2

**FIGURE 2**

SITE PLAN

NAVAL WEAPONS STATION, YORKTOWN-CHEATHAM ANNEX  
WILLIAMSBURG, VIRGINIA

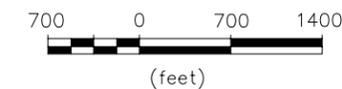
REVISION: --  
AUTHOR: A.CRABTREE  
PROJECT NO:  
FILE: SEE BELOW





**NOTES:**

1. ALL VENDOR DELIVERY TRUCKS AND MATERIAL HAUL TRUCKS WILL BE REQUIRED TO GO THROUGH THE TRUCK INSPECTION STATION AT THE NAVAL WEAPONS STATION YORKTOWN PRIOR TO GAINING ACCESS ABOARD CAX.
2. A TEMPORARY STONE ACCESS ROAD WILL BE PROVIDED BETWEEN GARRISON ROAD AND AOC 2.
3. TRUCKS WILL LINE UP ALONG GARRISON ROAD AND WILL BE BACKED IN ONE AT A TIME TO BE LOADED OR TO PLACE IMPORTED FILL.
4. ON-SITE TRAFFIC PATTERNS WILL BE ESTABLISHED AND COMMUNICATED TO DRIVERS, SPOTTERS WILL BE USED, AND SIGNAGE WILL BE PLACED AS APPROPRIATE.



REMOVAL ACTION AT AOC 2

**FIGURE 3**

TRAFFIC PLAN

NAVAL WEAPONS STATION, YORKTOWN-CHEATHAM ANNEX  
WILLIAMSBURG, VIRGINIA

REVISION: —  
AUTHOR: A.CRABTREE  
PROJECT NO:  
FILE: SEE BELOW



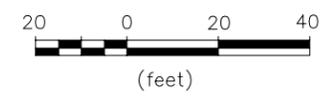
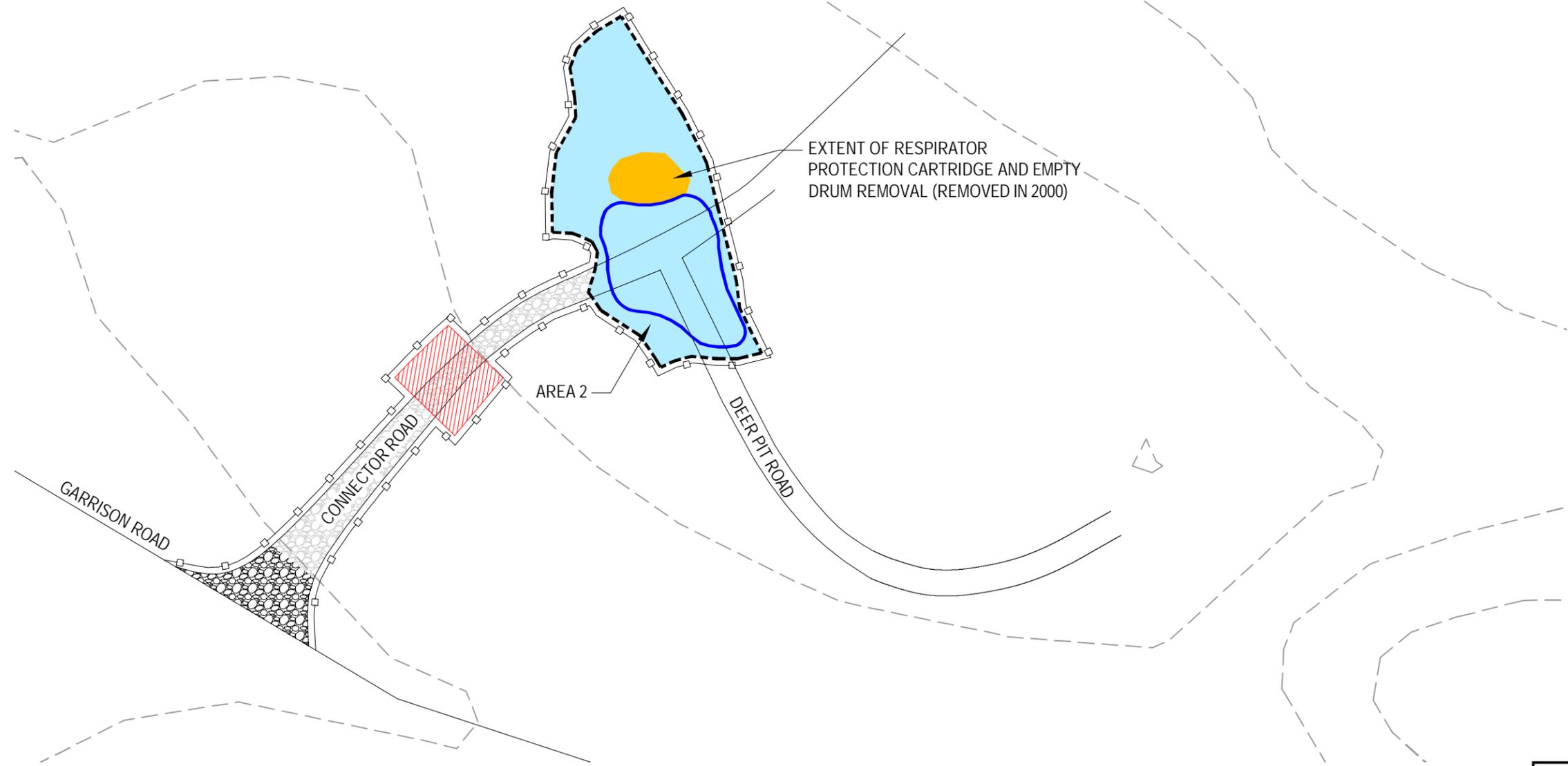


**NOTES:**

1. A DIG PERMIT WILL BE OBTAINED PRIOR TO BEGINNING EXCAVATION ACTIVITIES.
2. SIDE WALLS SHALL BE SLOPED ACCORDING TO THE TYPE OF MATERIAL PRESENT, AND AS REQUIRED TO PREVENT SLOUGHING AND PROVIDE A SAFE WORK AREA.
3. ACTUAL EXCAVATION EXTENTS WILL BE BASED ON THE VISUAL LIMIT OF DEBRIS AND POST-EXCAVATION CONFIRMATION SAMPLES.
4. EXCAVATED WASTE MATERIAL WILL BE STAGED WITHIN THE AREA 2 EXCAVATION BOUNDARY AND THEN LOADED INTO THE 2" SCREENER. SCREENED SOIL WILL BE DIRECT LOADED INTO HUAL TRUCKS. DRUM DEBRIS, CARTRIDGES, AND OTHER OVERSIZED DEBRIS WILL BE ACCUMULATED WITHIN A CONSTRUCTED CONTAINMENT AREA OR ROLL-OFF BOX AND FURTHER SEPARATED PER EACH WASTE STREAM AS APPROPRIATE.
5. POST-EXCAVATION CONFIRMATION SAMPLING WILL BE PERFORMED IN ACCORDANCE WITH THE SAMPLING AND ANALYSIS PLAN.
6. POST-EXCAVATION SURVEY WILL BE CONDUCTED TO CAPTURE EXCAVATION LIMITS.

**LEGEND:**

-  EXCAVATE TO A DEPTH OF 6 FEET bgs
-  EXCAVATE TO A DEPTH OF 9 FEET bgs
-  5FT CONTOURS
-  SILT FENCE
-  AREA 2 BOUNDARY
-  APPROXIMATE EXTENT OF 2000 CARTRIDGE AND DRUM REMOVAL
-  STAGING AREA FOR SCREENING OPERATIONS
-  TEMPORARY STONE CONSTRUCTION ENTRANCE



 Naval Facilities Engineering Command	
REMOVAL ACTION AT AOC 2	
<b>FIGURE 4</b> EXCAVATION PLAN	
NAVAL WEAPONS STATION, YORKTOWN-CHEATHAM ANNEX WILLIAMSBURG, VIRGINIA	
REVISION: — AUTHOR: A.CRABTREE PROJECT NO: FILE: SEE BELOW	

**APPENDIX A**  
**PROJECT SCHEDULE**

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## **APPENDIX B**

### **HAZARDOUS WASTE ACCUMULATION AREA INSPECTION LOG**

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## APPENDIX 6: SITE GUIDANCE for HAZARDOUS WASTE ACCUMULATION AREA

Enclosure: Hazardous Waste Accumulation Area Inspection Checklist for Containers Less Than or Equal to 119 Gallons.

### HW (<90 Day) Accumulation Area

**CHECK TO ENSURE**

- Drums are kept closed except when adding waste
- HW labels are facing outward
- Secondary containment is clean
- Contact Environmental Services (341-0412/0460) to arrange HW container pickup no later than the 45<sup>th</sup> day from **ASD**
- Site **MUST** be inspected every 7 days (records kept for 3 years)
- Aisle space **MUST** allow for removal of HW and a 360 degree inspection
- No limit on volume storage

HW Container **Legally Required** Label

**Must** have a start date if waste is placed in drum  
**(ASD)**

**Must** identify type of waste



HAZARDOUS WASTE

ACCUMULATION START DATE \_\_\_\_\_

CONTENTS \_\_\_\_\_

**HANDLE WITH CARE!**  
CONTAINS HAZARDOUS OR TOXIC WASTES

Please call the Hazardous Waste Manager with any HW issues: \_\_\_\_\_

If an uncontrolled spill occurs , please call \_\_\_\_\_

## HAZARDOUS WASTE ACCUMULATION AREA (HWAA) CHECKLIST

INSPECTOR	INSPECTION DATE/TIME	AREA
HW CUSTODIAN	PHONE NUMBER	HW TRAINING DATE
CODE/UNIT		
<b>All checklist questions must be answered. All "NO" answers require the violation to be noted and corrected unless otherwise noted. Comment may include violation description, action, date action completed, and other pertinent details.</b>		
<b>HAZARDOUS WASTE ACCUMULATION AREA Compliance Questions</b>	<b>Circle Answer</b>	<b>Comment</b>
1. Are good housekeeping standards employed?	Yes No	
2. Is the area free of any spills or container overfills (waste product on the container lid)?	Yes No	
3. Is a fire extinguisher located and available within 50 feet and is Inspection current?	Yes No	
4. Is spill control equipment (examples: absorbents) available at the Site?	Yes No	
5. Are HAZARDOUS WASTE inspections conducted and properly documented every 7 days?	Yes No	
6. Are HAZARDOUS WASTE inspection records kept for 3 years?	Yes No	
7. Is the HW operator/site custodian annual training up to date?	Yes No	
8. Is a "HAZARDOUS WASTE ACCUMULATION AREA" sign with Primary and Alternate emergency contact information posted at the site?	Yes No	
9. Is a "NO SMOKING" sign posted?	Yes No	
<b>If there is no hazardous waste currently stored at the site answer N/A for the remainder of checklist.</b>		
10. Are HAZARDOUS WASTE containers in good condition (non-leaking or non-corroded) and compatible with the waste stored in them?	Yes No N/A	
11. For hazardous waste containing volatile organics, are individual HAZARDOUS WASTE containers either (circle applicable items) a. less than 26 gallons? b. 26 or greater but less than 119 gallons; and DOT approved? c. Is air emissions documentation allowing non-DOT containers maintained with the inspection records?	Yes No N/A Yes No N/A Yes No N/A	
12. Are incompatible wastes separated by a wall, berm, or overpack to prevent mixing?	Yes No N/A	
13. Are HAZARDOUS WASTE containers kept sealed except when waste is being added or removed?	Yes No N/A	
<b>14. HW Labels</b>	a. does each HW container have a HW label?	Yes No N/A
	b. clearly visible and facing out for inspection?	Yes No N/A
	c. include the words, "HAZARDOUS WASTE?"	Yes No N/A
	d. include specific contents of the waste(s)?	Yes No N/A
	e. include the accumulation date?	Yes No N/A
15. Are old Hazardous Waste labels & markings removed?	Yes No N/A	
16. Date of oldest HW container in the HWAA.		
17. Has a pickup request been submitted for all HW containers that have been accumulating for more than 45 days?	Yes No N/A	
18. Are adequate aisle spaces maintained for incident response?	Yes No N/A	

For Environmental Personnel Only: Check Inspection Type: Oversight\_\_\_; Setup\_\_\_; Closeout\_\_\_

**APPENDIX C**  
**PROJECT QUALITY CONTROL PLAN**

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**DEPARTMENT OF THE NAVY  
NAVAL FACILITIES ENGINEERING COMMAND, ATLANTIC  
REMEDIAL ACTION CONTRACT (RAC)  
CONTRACT NO. N62470-13-D-8007  
CONTRACT TASK ORDER NO. WE36**

**FINAL  
CONTRACTOR QUALITY CONTROL PLAN  
REMOVAL ACTION AT AOC 2  
NAVAL WEAPONS STATION, YORKTOWN – CHEATHAM ANNEX  
WILLIAMSBURG, VIRGINIA**

**December 2015**

*Prepared for*



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

AHA	Activity Hazard Analysis
AOC	Area of Concern
APP	Accident Prevention Plan
Area 2	AOC 2 Area 2
CAX	Cheatham Annex
CIH	Certified Industrial Hygienist
COR	Contracting Officer's Representative
CPR	Contractor Production Report
CQC	Contractor Quality Control
CQCR	Contractor Quality Control Report
CTO	Contract Task Order
DCN	Design Change Notice
DFW	Definable Feature of Work
DN	Deficiency Notice
EHS	Environmental Health and Safety
EM	Engineer Manual
FCR	Field Change Request
FEAD	Facilities Engineering and Acquisition Division
MSDS	Material Safety Data Sheet
NAVFAC	Naval Facilities Engineering Command
Navy	Department of the Navy
NCR	Non-Conformance Report
NTCRA	Non-Time Critical Removal Action
PM	Project Manager
PQCM	Project Quality Control Manager
PS	Project Superintendent
QC	Quality Control
QCPM	Quality Control Program Manager
RAC	Remedial Action Contract
RPM	Remedial Project Manager
SHM	Safety and Health Manager
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
TBD	To Be Determined
TtEC	Tetra Tech EC, Inc.
UFGS	Unified Facilities Guide Specification
USACE	United States Army Corps of Engineers
WPNSTA	Naval Weapons Station

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## 1.0 INTRODUCTION

This Contractor Quality Control (CQC) Plan establishes the procedures and methods to be implemented for the specific activities pertaining to the Non-time Critical Removal Action (NTCRA) at Area of Concern (AOC) 2 at Naval Weapons Station (WPNSTA) Yorktown – Cheatham Annex (CAX) located in Williamsburg, Virginia. Tetra Tech EC, Inc. (TtEC) has been contracted by the Department of the Navy (Navy) to perform this work under Remedial Action Contract (RAC) N62470-13-D-8007, Contract Task Order (CTO) WE36. This CQC Plan fulfills the requirements of the TtEC quality control (QC) system requirements.

### 1.1 Background

CAX is located on the site of the former Penniman Shell Loading Plant, a large powder and shell loading facility operated by the DuPont Company during World War I, which closed in 1918 and was dismantled shortly thereafter. Between 1923 and 1943, the property was used for farming or remained idle until CAX was commissioned in 1943 as a satellite unit of the Naval Supply Depot to provide bulk storage facilities and to serve as an assembly and overseas shipping point during World War II. The facility is divided into two separate parcels, with the larger parcel situated along the banks of the York River. Almost all of the activities at CAX (administration, training, maintenance, support, and housing) take place in the larger parcel. The smaller parcel is used mainly as a watershed protection area. In 1987, CAX was designated as the Hampton Roads Navy Recreational Complex. In 1998, control of CAX was transferred from Fleet and Industrial Supply Center (FISC) to WPNSTA Yorktown. The current mission of CAX includes supplying Atlantic Fleet ships and providing recreational opportunities to military and civilian personnel.

AOC 2 is a less-than-1-acre wooded site located to the north of Garrison Road, along the southern perimeter of CAX. Historical information indicates that AOC 2 was an unlined, non-permitted disposal area with unknown dates of debris disposal. AOC 2 was identified during site visits by the Navy, USEPA, VDEQ, and Baker Environmental, Inc. (Baker) in late 1997 and early 1998 and consists of several rows of concrete foundation piers that at one time supported a shipping house associated with the former DuPont Company PSLP facility. The majority of structures associated with the PSLP facility were demolished between 1918 and 1925. Grass-covered lanes leading to the site area are likely remnants of former railroad lines that have been removed. Partially buried glass IV bottles (of which the majority were labeled “dextrose”) and unlabeled, empty, 55-gallon drums, respirator cartridges, deer carcasses, and surplus military clothing were discovered in the area. Several mounds also present in the area were suspected to contain buried debris (Baker, 2001). Based on the types of debris observed during test trenching activities, AOC 2 was separated into three areas: Areas 1a and 1b contain dextrose IV bottles, AOC 2 Area 2 (**Area 2**) contains unused respirator cartridges and empty 55-gallon drums, and Area 3 contains surplus military clothing. The CAX Partnering Team agreed the debris in Areas 1a, 1b, and 3 (dextrose IV bottles and military clothing) is inert and not a source regulated under CERCLA; therefore, it does not require removal. The topography of AOC 2 is predominantly flat. No wetlands or other surface water bodies are located at AOC 2, and there are no nearby water bodies down-gradient of the site. Surface runoff at the site is anticipated to pond and infiltrate into the subsurface or evaporate. In

general, the native soil is predominantly composed of clay and silt at AOC 2. As observed during test trenching activities in 2001, a sand fill layer was found to be present over buried materials in some areas of AOC 2 (Baker, 2002). The first encountered groundwater underlying AOC 2 is the Cornwallis Cave aquifer, at depths ranging from approximately 22 to 33 feet below ground surface (bgs); groundwater is expected to flow southeast toward King Creek (Baker, 1999). A facility and site location map is included as Figure 1.

## **1.2 Purpose**

The purpose of this CQC Plan is to establish specific procedures and methods for field inspections, and provide an effective QC system to ensure the quality of all work performed by TtEC and its subcontractor personnel during the remedial activities. This plan is applicable to all definable features of work listed in Section 3.0 and will be available at the project field office. All work activities will be conducted in accordance with this PCQC Plan and the Work Plan to which it is appended.

## **2.0 PROJECT ORGANIZATION, RESPONSIBILITY, AND POINTS OF CONTACT**

This section describes the organization and authority of project personnel. The organizational structure, functional responsibilities, levels of authority, and lines of communication within the organization have been established to ensure high-quality work. The project organization chart showing the reporting lines for key personnel is provided in Figure 2-1. The responsibilities of key personnel are described in the following subsections. A listing of the point of contact for the project is provided in Section 2.12.

### **2.1 Remedial Project Manager (RPM)**

The Remedial Project Manager (RPM) has primary responsibility with the Navy for day-to-day management of the project activities performed under this Work Plan and for its successful completion. The RPM is responsible for the following:

- Perform project management for the Navy.
- Ensure the project scope of work requirements are fulfilled.
- Oversee the project cost and schedule.
- Provide formal technical direction to the TtEC project team, as needed.
- Coordinate with other RPMs for other projects being performed to ensure that proper controls are in place.
- Act as lead in interacting with regulatory agencies.

### **2.2 Facilities Engineering and Acquisition Division (FEAD) Representative**

The Facilities Engineering and Acquisition Division (FEAD) Representative is the Navy representative with the primary responsibility for providing on-site QA and safety oversight of contractors. The FEAD representative is responsible for the following:

- Verify that all work has been completed per contract and technical specifications prior to final government acceptance.
- Perform ongoing field inspection to verify that all work is in compliance with both contract and technical specifications.
- Notify the contractor of any work not in compliance.
- Notify the contractor of any work being performed in an unsafe manner.
- Interact with the contractor's Project Quality Control Manager (PQCM) on quality-related issues.
- Review Contractor Daily Reports for completeness and accuracy.
- Attend preparatory phase, initial phase, pre-final, and final acceptance inspections.
- Attend weekly QC meetings.

### **2.3 Project Manager (PM)**

The Project Manager (PM) is the TtEC representative responsible for the direction, execution, and successful completion of project tasks to achieve overall project goals. The PM has responsibility for and the authority to direct all segments of the project including technical, construction, and administrative activities. The PM is responsible for the following:

- Coordinate work activities of subcontractors and TtEC personnel and ensure that all personnel adhere to the administrative and technical requirements of the project.
- Monitor the status and progress of work and ensure that project deliverables are completed on time and within the project budget.
- Monitor the budget and schedule, and notify the client and the Program Manager of any changes that may require administrative actions.
- Ensure adherence to the quality requirements of the contract, project scope of work, and the QC plans.
- Ensure that all work meets the requirements of the work plans, procedures, and technical specifications and complies with applicable codes and regulations.
- Ensure that all work activities are conducted in a safe manner in accordance with the Accident Prevention Plan (APP)/Site Safety and Health Plan (SSHP) – Safety and Health Requirements (Engineer Manual [EM]-385-1-1) (USACE, 2008), and all applicable Occupational Safety and Health Administration regulations.
- Ensure that change conditions are properly identified and documented with the appropriate approvals.
- Serve as the primary contact with the Navy and TtEC for actions and information related to the work and make sure to include appropriate TtEC lead and experts in decision-making.
- Coordinate satisfactory resolution and completion of evaluation and acceptance for Nonconformance Reports (NCRs).
- Attend required meetings, including the preconstruction conference, weekly QC meetings, pre- and post-construction site inspections, and other scheduled and unscheduled meetings.

## **2.4 Safety and Health Manager (SHM)**

The SHM is the TtEC representative responsible for implementing and overseeing the Contract Health and Safety Program and for developing, implementing, and approving all APPs/SSHPs. Any changes to the established Contract Health and Safety Program or APP/SSHP must be at the direction and approval of the SHM, with concurrence of the Navy Administrative Contracting Officer. The SHM or designee will not necessarily be on-site during all remedial activities but will be readily available for consultation when required.

The SHM or designee is a Certified Industrial Hygienist (CIH) who is certified by the American Board of Industrial Hygiene. The SHM supervises and directs the activities of the Site Safety and Health Officer (SSHO). The SHM has the authority to stop unsafe operations, remove unqualified personnel from the work area, and approve changes to the APP/SHSP. The SHM is responsible for the following:

- Oversee all aspects of the APP/SHSP from development to implementation.
- Advise the SSSH on all related health and safety matters.
- Review site-specific plans for completeness and compliance.
- Review other site documents as they affect health and safety (e.g., Activity Hazard Analyses [AHAs] and sampling plans).
- Review and evaluate all monitoring results.
- Establish and monitor all related health and safety procedures through site safety inspections and audits.
- Ensure that TtEC employees receive required environmental health and safety (EHS) regulatory training.
- Fulfill specific responsibilities for project EHS personnel that are identified within each EHS procedure.
- Function as a technical resource for all environmental compliance, safety, loss control, and industrial hygiene issues.

## **2.5 Quality Control Program Manager (QCPM)**

The Quality Control Program Manager (QCPM) is the TtEC representative responsible for the oversight of program QC, including field activities and data acquisition. The QCPM is responsible for the following:

- Coordinate and resolve quality concerns.
- Provide quality-related direction and ensure the training of the PQC and others performing quality-related functions.
- Suspend project activities if quality standards are not maintained.
- Interact with the Navy on quality-related issues.
- Review audit and surveillance reports.
- Implement the Navy technical directives related to quality.

## **2.6 Project Superintendent (PS)**

The Project Superintendent (PS) is a TtEC representative who reports to the PM and is responsible for coordinating, directing, implementing, and supervising site construction activities. The PS or designated representative will be on-site at all times during field activities. The PS is responsible for the following:

- Implement field activities in accordance with the Work Plan.
- Direct support personnel and subcontractors.
- Administer site access and communication.
- Maintain the work site, facilities, vehicles, and equipment.
- Coordinate work activities and ensure all personnel adhere to the administrative and technical requirements of the project.
- Prepare status reports and estimate future scheduling needs.
- Prepare daily Contractor Production Reports (CPRs).
- Monitor the status and progress of field activities and ensure that project deliverables are completed on time and within the project budget.
- Ensure work activities in the field are conducted in a safe manner in accordance with the APP/SSHP.
- Investigate with the SSHO all incidents, accidents, injuries, illnesses, and near misses.

## **2.7 Project Quality Control Manager (PQCM)**

The PQCM is the TtEC representative responsible for overall management of project QC and reports to the QCPM. The PQCM has the authority to stop work on site-related issues affecting the quality of the work performed and for directing the correction of all nonconforming work. The PQCM or designated representative will be on-site at all times during field activities. The PQCM is responsible for the following:

- Provide and maintain an effective QC system for all site activities.
- Monitor QC activities to ensure conformance with authorized policies, procedures, contract specifications, required standards, and methods of quality construction.
- Prepare the daily Contractor Quality Control Reports (CQCRs).
- Coordinate and perform the three phases of inspection (preparatory, initial, and follow-up) for all definable features of work (DFWs).
- Responsible for issuance, maintenance, and enforcement of NCRs and other quality actions.
- Ensure that on-site and off-site inspections, testing, and sampling are performed in accordance with the plans, procedures, specifications, and applicable codes.
- Ensure that all required tests and inspections are performed and documented.
- Conduct required QC meetings, including the coordination and mutual understanding meeting, site survey visit, and other scheduled meetings.
- Coordinate and maintain submittal register, photograph log sheet, request for information, and NCR log and other required logs or registers.

- Review and maintain records of approved submittals, Design Change Notices (DCNs), and Field Change Requests (FCRs) for construction activities.
- Inspect material delivery handling and storage in accordance with technical specifications.
- Review and approve submittals and shop drawings and/or forward submittals as information only or for approval.
- Review project plans and procedures for quality issues.
- Confirm the removal or rework of material, equipment, or work activity that is not in compliance with plans and specifications.
- A copy of the Delegation of Authority Letter is provided in Appendix A and a copy of the PQCM resume is provided in Appendix B.

## **2.8 Site Safety and Health Officer (SSHO)**

The SSHO is the TtEC representative who reports directly to the SHM and ensures all elements of the APP/SSHPs are implemented and enforced on-site. The SSHO has full authority to issue stop work orders or evacuation orders when work operations or noncompliance(s) may threaten the health and safety of site workers or the public. The SSHO is responsible for the following:

- Ensure that all personnel understand the requirements of the TtEC EHS program and procedures through training and communication.
- Investigate with the PS all incidents, accidents, injuries, illnesses, and near misses.
- Ensure project personnel are trained in the hazards of substances used on the project, maintain Material Safety Data Sheets (MSDSs) and make them accessible to project personnel, and perform inspections and oversight to ensure the Waste Management Plan is being followed.
- Ensure tailgate safety meetings are conducted daily prior to start of work and are documented.
- Ensure project safety equipment is inspected and in good working order as required by the EHS program.
- Coordinate site health and safety requirements with the PS and PM.
- Ensure that all health and safety monitoring equipment and personal protective equipment are maintained and direct site-monitoring activities.
- Coordinate daily field activities with the PS.
- Coordinate site safety and emergency response duties and verify site communications system with site personnel.
- Report incidents to the FEAD Representative as required by EM 385-1-1 (USACE, 2008).
- Report immediately to the PM, RPM, and FEAD Representative any fatal injury, persons admitted to a hospital, or damage to government property.
- Ensure all personnel have the required training and medical clearance prior to entering the exclusion zone at the site; inform the PS of any site personnel with medical restrictions.
- Determine and post routes to medical facilities and telephone numbers for emergency transportation to medical facilities.
- Serve as the Project Hazard Communication Coordinator.

- Maintain training records and medical certifications for all on-site personnel, including subcontractors.
- Initiate revisions or changes to the APP/SSHP to support changing site conditions.
- Maintain site control procedures.
- Maintain current records of certification for first aid and cardiopulmonary resuscitation training for field personnel.
- Attend meetings, including the preconstruction conference, weekly QC meetings, pre- and post-construction site inspections, and other project meetings.

## 2.9 Subcontractors and Vendors

Qualified subcontractors may be selected to provide various construction services for this project. The subcontractor is required to provide labor, material, and equipment necessary to conduct construction activities as directed by the PM. Subcontractors and vendors will be required to conform to TtEC's quality requirements of all approved procedures, technical specifications, and contract provisions.

The subcontractor is responsible for field inspection of their construction and operating activities. TtEC personnel will monitor, oversee, and make on-site observations and inspections of work in progress to determine whether the subcontractor's work is proceeding in accordance with TtEC's quality requirements.

Subcontractor personnel are responsible for maintaining a daily log of the project activities they perform and for providing information needed to complete the Daily CQC Report. All inspection records, including inspection reports, deficiency reports, and re-inspections of corrective actions, will be documented.

## 2.10 Points of Contact

The following is a list of the key project, Navy, and regulatory contacts:

Name and Title	Contact Information
Navy Contract Specialist, Andres Medina	(757) 341-1663
Remedial Project Manager/Navy Technical Representative, Angela Jones	(757) 341-0485 (office phone)
TtEC Project Manager, Mark Pisarcik	(757) 518-8491 (office phone) (757) 544-2085 (cellular phone)
TtEC Quality Control Program Manager, Greg Joyce	(360) 598-8117 (office phone) (360) 780-0371 (cellular phone)
TtEC Safety and Health Manager, Roger Margotto, CIH	(619) 471-3503 (office phone) (619) 988-0520 (cellular phone)
TtEC Project Environmental Manager, Gary Phelps	(757) 328-7643 (cellular phone)

Name and Title	Contact Information
TtEC Project Superintendent, Gary Phelps	(757) 328-7643 (cellular phone)
TtEC Project Quality Control Manager, Gary Phelps	(757) 328-7643 (cellular phone)
TtEC Site Safety and Health Officer, Gary Phelps	(757) 328-7643 (cellular phone)
Facility Fire Department	(757) 887-4911
FEAD Representative, George Colley	(757) 887-4303 (office phone) (757) 636-7215 (cellular phone)
Installation Representative, Jennifer Podbesek	(757) 877-4086
National Response Center	(800) 424-8802
Virginia Department of Environmental Quality Tidewater Region Office	(757) 518-2000 (business hours) (800) 468-8892 (24-hour)

*Abbreviations and Acronyms:*

COR – Contracting Officer’s Representative

### 3.0 DEFINABLE FEATURES OF WORK

A DFW is defined as an activity or task separate and distinct from other activities that requires separate control activities. The DFW establishes the control measures required to verify both the quality of work performed and compliance with specified requirements, which include inspecting materials and workmanship before, during, and after each DFW. Preparatory and Initial inspections will be performed on all DFWs, with the exception of mobilization and demobilization. Activities that will be covered by the PQCM during the inspections are listed in Table 3-1.

The following DFWs have been identified for the project:

- Mobilization and Setup,
- Clearing Activities,
- Excavation of Soil and Debris,
- Mechanical Screening of Soil,
- Sampling Activities,
- Backfilling and Site Restoration,
- Transportation and Disposal (T&D) of Waste, and
- Demobilization.

### 4.0 SUBMITTALS

This section describes the review and approval process of submittals. TtEC will institute and maintain a submittal register (Appendix C) to track submittals from issuance to approval. A list of required submittals will be developed at the initiation of project activities and revised as necessary. Submittals will be scheduled, reviewed, certified, and managed in accordance with the procedures defined in this section.

Standard Unified Facilities Guide Specification (UFGS) submittal titles are as follow:

- SD-01 Preconstruction Submittals
- SD-02 Shop Drawings
- SD-03 Product Data
- SD-04 Samples
- SD-06 Test Reports
- SD-07 Certificates
- SD-08 Manufacturer's Instructions
- SD-11 Closeout Submittals

Descriptions of the submittals listed above are provided in Section 1.1.2 of the UFGS Section 013300 (NAVFAC 2010).

#### **4.1 Review of Submittals**

Submittals will be reviewed to ensure completeness, accuracy, and contract compliance. Submittal of a certification will be inspected and approved by the PQCM for conformance to the project specifications or certification criteria. All items will be checked and approved by the PQCM or designated representative. Any submittals requiring modifications or changes will be returned to the originating organization for correction and then resubmitted for review and approval prior to acceptance. Approved submittals will be stamped, signed or initialed, and dated. During the preparatory phase of the QC inspections, the PQCM or designated representative will ensure that all materials and equipment have been tested and approved. No field activities will be performed without the required approval of applicable submittals.

#### **4.2 Submittal Process**

Required submittals will be provided to project personnel as determined by the distribution schedule. Each submittal will be assigned a unique document control number.

A transmittal form will accompany each submittal. Each transmittal will be identified with:

- Contract and CTO number
- Name and address of the submitting organization
- Date of submittal
- Description of item being submitted, including reference to specification section (if applicable)
- Approval of submitting organization indicating conformance to the requirements

The PQCM will update the submittal register regularly.

### **4.3 Review and Processing of Submittals that Do Not Require Navy Approval**

Material submitted for review by the PQCM will indicate whether or not it conforms to established requirements. The PQCM will inform the submitter of the results of the review. The submittal log will be updated to indicate the status.

Conforming submittals will be transmitted to project and Navy personnel as determined by the distribution schedule. A transmittal form will accompany all items sent to the Navy and will list each item transmitted, the date it was reviewed by the PQCM, and its review status.

Nonconforming submittals will be returned to the submitter for correction, resolution of comments, and resubmittal.

### **4.4 Review and Processing of Submittals that Require Navy Approval**

Submittals reviewed by the PQCM will be transmitted to the Navy in accordance with the project distribution schedule for further review and approval. All items sent to the Navy will use a transmittal form that will indicate each item transmitted, the date reviewed by the PQCM, and its review status. Upon completion of review, the FEAD representative will either return the transmittal form to the PQCM for further action or accept the submittal as complete.

The PQCM will advise the submitter of the results of the review in writing and include any comments. The submittal log will be updated to indicate status.

Nonconforming submittals may be returned to the submitter for correction, resolution of comments, and resubmittal, if required.

### **4.5 Revised Submittals**

Revised submittals will be logged, reviewed, and processed in a manner identical to the initial submittal.

## **5.0 TESTING**

The PQCM or designated representative will verify the performance of all tests specified or required by the Work Plan to ensure that control measures are adequate to provide a product conforming to contract specifications. General requirements for testing procedures to be implemented for this project are included in the Work Plan. The type, number, and frequency of required tests are specified in the Testing Plan and Log (Appendix C). These tests include both operational and acceptance testing as appropriate.

### **5.1 Documentation**

All test results, both passing and failing, will be documented as a summary report in the Daily CQCR on the last day of each month. Paragraph reference, location where tests were taken, and

the sequential control number identifying the test will be given. The test reports will be available for review by the FEAD Representative and transmitted with the Project After Action Report.

## **5.2 Laboratory Services**

An independent testing laboratory will provide laboratory services, as needed. The laboratory will be selected and qualified in accordance with recognized industry and applicable project requirements.

## **5.3 Testing Plan and Log**

The Testing Plan and Log (Appendix C) lists tests required by the project specifications and drawings. Testing will be conducted to verify that control measures are adequate to provide a product conforming to contract specifications. General requirements for testing procedures to be implemented for this project are included in the Work Plan.

## **6.0 QUALITY CONTROL MEETINGS**

### **6.1 Coordination and Mutual Understanding Meeting**

Prior to the start of site work, a coordination and mutual understanding meeting will be held to discuss the QC Program requirements. Navy personnel attending the meeting will include the RPM, and the FEAD Representative. The purpose of this meeting is to develop a mutual understanding of the QC details, including forms to be used, administration of on-site and off-site work, coordination of the field activities, production, and the PQCM duties with the FEAD Representative. At a minimum, the TtEC personnel required to attend the meeting will include the PM, PS, and PQCM. Minutes of the meeting shall be prepared by the PQCM and signed by the PM and the Navy's RPM and/or FEAD Representative or designated representative. The meeting may be held in conjunction with the preconstruction meeting.

### **6.2 QC Meetings**

After the start of field activities, the PQCM will conduct QC meetings at a frequency of once per week or as required by the FEAD Representative. The meetings will be held at the project site and will be attended by the FEAD Representative, PS, SSHO, and PQCM. The PQCM will notify the FEAD Representative at least 48 hours in advance of each meeting. The following will be covered at each meeting:

- Review the minutes of the previous meeting.
- Review the schedule:
  - Work or testing accomplished since last meeting
  - Rework items identified since last meeting
  - Rework items completed since last meeting
- Review the status of submittals:

- Submittals reviewed and approved since last meeting
- Submittals required in the near future
- Review the work to be accomplished in the following 2 weeks, documentation required, and schedule for the three phases of control and testing:
  - Establish completion date for rework items
  - Required preparatory phase inspections
  - Required initial phase inspections
  - Required follow-up phase inspections
  - Required testing
  - Status of off-site work or testing
  - Required documentation
  - Identification of deficient conditions
- Resolve QC and production problems.
- Address items that may require revisions to the PCQC Plan.

## **7.0 INSPECTIONS**

This section discusses the inspection process for the DFWs that will ensure compliance with the contract. The DFWs for this project are identified in Section 3.0 and listed in Table 3-1.

The PCQC Plan includes implementing the following three control phases for all aspects of the work specified:

- Preparatory phase
- Initial phase
- Follow-up phase

### **7.1 Preparatory Phase Inspection**

The PQCM will conduct preparatory phase inspections prior to starting the DFWs listed in Table 3-1 with the exception of mobilization and demobilization. These inspections shall include the following:

- Review the Work Plan and Standard Operating Procedures.
- Ensure that all required procurement forms for supplies and services are approved.
- Ensure that provisions have been made to provide the required QC inspection.
- Ensure that all personnel have the required training and certifications needed to perform the work.
- Examine the work area to ensure that all required preliminary work has been completed and is in compliance with the approved Work Plan.
- Examine the required materials and equipment to ensure that they are properly delivered to the site, conform to specifications, and are properly stored.

- Review the appropriate AHAs to ensure that safety requirements are met.
- Discuss procedures for performing the work, including potential repetitive deficiencies.
- Document workmanship standards for the particular phase of work.
- Ensure that the PCQC Plan for the work to be performed has been accepted by the Navy.

The PQCM will conduct frequent internal inspections of mobilization and demobilization, which will include the items listed on Table 3-1. The PQCM is not required to notify the Navy or the PM prior to these inspections.

The PM, Navy RPM, and FEAD Representative will be notified at least 2 working days in advance of each preparatory phase activity. This phase will include a meeting conducted by the PQCM and attended by the PS and any personnel involved in performing the DFW.

The issues discussed during the preparatory phase meetings will be documented on the Preparatory Inspection Checklist (**Appendix C**). The PQCM will explain the acceptable level of workmanship required to personnel performing work activities.

## **7.2 Initial Phase Inspection**

An initial inspection will be performed at the beginning of a DFW and will include the following:

- Check preliminary work to ensure that it is in compliance with contract requirements.
- Review the Inspection Checklist documenting results of the preparatory meeting.
- Verify full contract compliance, including required control inspections.
- Establish the required level of workmanship, testing, and inspection to ensure that work meets minimum acceptable standards.
- Resolve all differences.
- Check safety requirements to include compliance with and upgrading of the APP/SSHP and AHAs.

The PM, Navy RPM, and FEAD Representative will be notified in advance of each initial phase activity. The PQCM will document initial inspections for each item using the Initial Inspection Checklist (Appendix C) and attach it to the Daily CQC Report. The location of the initial phase inspection and documentation will be identified for future reference and comparison with follow-up inspections.

The initial phase inspection will be reviewed each time a new crew arrives on-site or when features of the work change.

## **7.3 Follow-Up Phase Inspection**

During the completion of a particular work feature, follow-up inspections will be conducted to ensure compliance with contract requirements. The frequency of the follow-up inspections will depend on the extent of the work being performed. Each follow-up inspection will be documented on the Daily CQC Report. A Follow-up Inspection Checklist (Appendix C) will be generated for

any deficient conditions identified during the Initial Inspection and attached to the Daily CQC Report when all items are resolved. A final follow-up check will be conducted on any completed work phase prior to the commencement of a subsequent phase.

#### **7.4 Receipt Inspections**

The PQCM will conduct inspections of materials prior to their use and installation. These inspections will be documented on a receipt inspection form and maintained on-site. Any material(s) that does not meet design specifications will be rejected and returned to the vendor. Nonconforming material will be segregated and marked accordingly, to prevent inadvertent use. The PQCM will record on the Daily CQC Report that a material inspection was performed.

#### **7.5 Additional Inspections**

The PQCM may conduct additional inspections on the same DFWs under the following circumstances:

- If the quality of ongoing work is unacceptable as determined by the PQCM, PM, PS, Navy RPM, or FEAD Representative
- If the quality of the work is suspected of being below the established criteria of acceptance
- If work on a DFW is resumed after a substantial period of inactivity
- If other problems develop

#### **7.6 Completion Inspection**

Completion inspections will be performed as summarized in this section.

##### **7.6.1 Construction Quality Control Completion Inspections**

The PQCM will conduct a detailed inspection prior to the pre-final inspection, when all of the work or an increment of work is deemed to be substantially complete. The work will be inspected for conformance to plans and specifications, workmanship, and completeness. The PQCM will prepare an itemized list of work that does not conform to plans and specifications, inferior workmanship, or incomplete work. The list will also include outstanding administrative items, such as record (as-built) drawings. The list will be included in the QC documentation and submitted to the PM following the inspection and will specify an estimated date for correction of each deficiency. The completion inspection will be documented on the Completion Inspection Checklist (Appendix C) and attached to the Daily CQC Report.

##### **7.6.2 Pre-final Inspection**

The PM or designated representative will conduct the pre-final inspection. The Navy RPM, FEAD Representative, PQCM, PS, and other primary management representative(s), as applicable, will attend. The PM will schedule the pre-final inspection when notified by the PQCM that the work is ready for inspection. The PQCM is required to verify at this time that all specific items previously

identified as being unacceptable, along with all remaining project work, will be complete and acceptable by the date scheduled for the pre-final inspection. At this inspection, the FEAD REPRESENTATIVE will develop a list of incomplete and/or unacceptable work performed under the contract and will provide this list to TtEC.

### 7.6.3 Final Acceptance Inspection

The PM will schedule the final acceptance inspection based on notification from the PQCM of readiness. The Navy RPM, PS, FEAD Representative, PQCM, and other primary management representative(s), as applicable, will attend. Notification will be provided prior to the planned final acceptance inspection date and must include verification that all specific items previously identified as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection.

## 7.7 **Inspection Documentation**

The PQCM is responsible for maintaining the inspection records. Inspection records will be legible and clearly provide all information necessary to verify that the items or activities inspected conform to the specified requirements. In the case of nonconforming conditions, the PQCM will provide evidence that the conditions were brought into conformance or otherwise accepted by the FEAD Representative. All inspection records will be made available to the Navy.

## 8.0 **DOCUMENTATION**

Preparation, review, approval, and issuance of documents affecting quality will be controlled to the extent necessary to ensure compliance to specified requirements. Project documents that will be controlled, if issued, include the following:

- Meeting minutes, conference notes, and confirmation notes
- Submittal Register
- Inspection documentation
- Contractor Production Report
- Daily CQC Report
- Material inspection and shipping logs
- NCRs
- NCR log
- FCRs
- Rework Items list
- Photograph log
- Field logbooks

## **8.1 Daily Contractor Quality Control Report**

The PQCM is responsible for maintenance of current records of QC operation, activities, inspections, and tests performed, including the work of subcontractors and suppliers. The records will include factual evidence that required QC activities and tests were performed. The Daily CQC Report will be completed to document site activities covered by the PCQC Plan and will include:

- Records of inspection and /or testing performed
- Identification and location of each DFW and its current phase (preparatory, initial, follow-up) of completion
- Results of inspections and/or testing
- Location and description of deficiencies
- Deficiencies corrected as of the date of the report
- Rework items
- Deviations from plans, difficulties, and resolution
- Test and/or control activities performed with results and references to specifications and/or plan requirements, including the control phase (preparatory, initial, and follow-up) and deficiencies (along with corrective action)
- Material received, with statement as to its acceptability and storage
- Submittals reviewed with contract reference, reviewer, and action taken
- Off-site surveillance activities, including actions taken
- PQCM signature

The records will describe both conforming and nonconforming features and include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The Daily CQC Report attached to the Contractor Production Report will be furnished to the FEAD Representative by 10:00 a.m. on the first work day following the date covered by the report, or as agreed to by the FEAD Representative. The report need not be submitted for days in which no work is performed. At a minimum, one report will be prepared and submitted for every 7 days of no work and on the last day of a no-work period. All calendar days will be accounted for throughout the life of the contract. The first report following a day of no work will summarize work for that day only.

The Daily CQC Report will be signed and dated by the PQCM and other appropriate personnel, including subcontractors responsible for completion of activities. The report will include copies of test reports.

## **8.2 Contractor Production Report**

The Contractor Production Report will be prepared for each day work is performed and will be attached to the Daily CQC Report prepared for the same day. The Contractor Production Report will be prepared, signed, and dated by the PS or designated representative, and will contain the following information:

- Contractor and subcontractor(s) and their area of responsibility
- Trades working on the project that day and number of personnel
- Operating equipment, with hours worked, idle, or down for repair
- Work performed that day, including location, description, weather conditions, and who did the work
- Any delays encountered
- Site visitors and the purpose of the visit
- Job safety evaluations stating what was checked, results, and instructions or corrective actions
- A list of instructions given and/or received and conflicts in plans and/or specifications
- Contractor's verification statement

### **8.3 Logbooks**

The PQCM will maintain a logbook to document QC activities. The information in the logbook is intended to serve as a phone log and memory aide in the preparation of the Contractor Daily Quality Control Report and in addressing follow-up questions that may arise.

### **8.4 Photographs and Photo Logs**

The PQCM will maintain photographs and a photo log to document site activities. Each photograph will have a date and time stamp on it or the photograph will show a sign board documenting the date and time clearly and legibly in the photograph. The photo log will identify each photograph by date, time, location, and activity.

### **8.5 Conference Notes and Confirmation Notes**

In addition to other required documentation, the PQCM is responsible for taking notes and preparing the reports of all conferences. Conference notes will be typed and the original report furnished to the Navy within 5 days of the date of the conference for concurrence and subsequent distribution to all attendees. At a minimum, this report will include the following:

- Date and place the conference was held
- List of attendees, including name, organization, and telephone number
- Comments made during the conference and decisions affecting criteria changes
- Conference notes that augment the written comments

The PM is also responsible for providing a record of all discussions, verbal directions, telephone conversations, and so forth in which TtEC personnel or their representatives participate on matters relating to this contract and work. These records, titled Confirmation Notices, will be numbered sequentially and will fully identify participating personnel, subject discussed, and any conclusions reached. The PM or designated representative will forward a reproducible copy of the confirmation notices to the Navy RPM and FEAD Representative within 5 working days.

## **9.0 CHANGE MANAGEMENT**

This section describes the DCN and FCR, the two main vehicles to document project changes.

### **9.1 Design Change Notices (DCN)**

The following sections detail the identification, preparation, and review and approval process for Design Change Notices.

#### **9.1.1 Identification**

Any member of the Project Team may identify the need for a change to the design specifications or drawings. The Project Team member will notify the PCQM, who will evaluate the request and initiate a DCN, if determined necessary.

#### **9.1.2 Preparation**

The PQCM will generate a DCN form (Appendix C) and submit it to the Design Engineer for review and disposition. The DCN will identify the specification requirements, the proposed change, and the reason for the change.

#### **9.1.3 Review and Approval**

The PM, PS, and QCPM will review and approve the DCN. It is the responsibility of the PM to notify the Navy for approval of the DCN prior to making any changes identified on the DCN.

#### **9.1.4 Implementation of Approved DCNs**

The PS is responsible for the implementation of approved DCNs.

#### **9.1.5 Records**

Each approved DCN will be sequentially numbered as follows:

DCN-CTO X-YY,  
Where:

X is the task order number and YY is the DCN number, beginning with 01.

A DCN log shall be maintained by the PQCM that provides the DCN number, date of DCN, and brief description of contents.

Each DCN will be copied to all the management signatories, the PS, PQCM, SSHO, and other personnel as deemed appropriate by the PM.

Copies of the approved DCN should be posted or otherwise included in daily site briefings as appropriate to ensure that all site personnel are aware of the changes to the task order program. Copies of DCN will be issued to all holders of controlled copies. The DCNs will be required to be maintained with the controlled copy of the document that has been changed.

## **9.2 Field Change Request**

Site personnel will document changes to the approved plans (except the design specifications and drawings) in the field through the FCR form (Appendix C). At a minimum, the following information will be documented in the FCR form:

- Project name
- CTO number
- FCR number
- Documents to which a change is requested (including revision number if applicable)
- Description of the item or condition for which the change is requested
- Reason for the change
- Recommended disposition
- Cost and schedule implication of the change, if any
- Approval of disciplines
- Approval of the PM, PS, PQCM, SHM, and QCPM and concurrence from the RPM or FEAD Representative

## **10.0 NONCONFORMANCE**

All deficiencies or nonconforming conditions discovered during inspections or other QC functions will be noted on either a Deficiency Notice (DN) or a Nonconformance Report (NCR), as appropriate.

A DN is used to document the failure to develop, document, or implement effectively any applicable element of approved plans or to follow established procedures. A deficiency could lead to a nonconformance.

An NCR is used to document a nonconforming condition that renders the quality of an item, process, or product that has been defined in the specifications or drawings as unacceptable or indeterminate.

Copies of these forms are provided in Appendix C along with the logs used for tracking these documents. All deficiencies and nonconforming conditions will be resolved prior to completion of the project and in the timeliest manner possible. The DN will be used for all conditions that do not affect the final work product. An NCR will be used when a condition may affect the final work product and requires disposition by the Design Engineer of Record.

The PQCM will be notified of all deficiencies and nonconforming conditions identified during the course of the field activities to ensure that each of these occurrences is documented, reported, and tracked; and that corrective actions are taken and follow-up verification is conducted.

The PQCM will also document deficiencies and nonconforming conditions in the Contractor Daily Quality Control Report, noting the items found to be deficient or nonconforming; the date; time, and location; the person who identified the deficiency or nonconformance; and the status of the item to which the deficiency or nonconformance applies.

The PQCM will update the status of the deficiency when it changes. Before the work activities of the day begin, the PQCM will note the deficiencies or nonconforming conditions that require follow-up verification that day. New or changed status will be entered into the file at the end of each day. The Contractor Daily Quality Control Report will document completion of the corrective action for each deficiency or nonconformance for that day. Nonconforming conditions or deficiencies that require rework for resolution will be noted on the Rework Items List included in Appendix C. Rework Items List will be included with the Contractor Daily Quality Control Report on the last day of the month that work is performed.

### **10.1 Root Cause Analysis**

The DN and the NCR forms both include space to enter information regarding the cause of the problem and the proposed resolution. The determination of the root cause of a deficiency or nonconformance is an integral part of the QC process. Root-cause analysis will be made by the PQCM in conjunction with other appropriate site personnel such as the Project Superintendent and the SSHO. Criteria considered in the analysis will include:

- staff qualifications and training
- adequacy of procedures and methods
- adequacy of equipment
- adequacy of QC measures

Input will be obtained, as necessary, from field staff and technical advisors in order to identify the factors that led to the problem.

### **10.2 Corrective Action**

Following the root cause analysis, the PQCM will evaluate potential solutions (corrective actions) to determine which remedy is most effective in correcting the problem. This process will include all appropriate staff. Potential remedies considered will include:

- supplemental staff training
- changes of equipment or modification of equipment currently in use
- acquisition of supplemental equipment
- implementation of new procedures or modification of existing procedures
- changes in QC procedures

Final approval of all remedies will be the responsibility of the PM.

Successful implementation of corrective action will be documented by the PQCM in the appropriate areas of the DN or NCR. This documentation will be supported by changes to the inspection procedures or schedule as warranted (i.e., the PQCM will not certify that corrective action has been taken until inspection of the actions and the resulting changes in the program are complete).

### **10.3 Condition Requiring Stop Work**

If corrective actions are insufficient, resolution cannot be reached, or results of prior work are indeterminate, work may be stopped. The PQCM will direct the PM to suspend work associated with the nonconformance until corrective action is complete. The PQCM will notify the QCPM immediately after stopping work. If there is a disagreement between the PQCM and the PM, the difference will be brought to the attention of the QCPM until resolution is achieved.

The conditions of the suspension of work will be described in detail on the CQC daily report and on the Rework Items List, if corrective action is not completed by the end of the working day Work will not continue until the directed by the individual who authorized it.

## **11.0 QUALITY MANAGEMENT**

In addition to the required QC field inspections, the TtEC Quality Management System requires a quality management overview of the site QA/QC Program implementation. The PQCM will perform regular internal QC checks on the site implementation of the QA/QC Program. Reports of any deficiencies will be provided to the PM for corrective action.

Inspections will be performed and checked for the following:

- Conformance with Work Plan and associated plans
- Thoroughness of performance
- Identification and completeness of documentation generated during performance

## **12.0 REFERENCES**

NAVFAC (Naval Facilities Engineering Command) 2006. Unified Facilities Guide Specifications (UFGS) 01330, Submittal Procedures. April 2006.

USACE (United States Army Corps of Engineers) 2008. Safety and Health Requirements. Engineer Manual (EM) 385-1-1. September 2008 Consolidated. August 2011.

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## **TABLES**

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**Table 3 - 1 Definable Features of Work**

ACTIVITY	PREPARATORY	DONE	INITIAL	DONE	FOLLOW-UP	DONE
Mobilization and Setup	<ul style="list-style-type: none"> <li>Verify that RPM and FEAD have been notified of preparatory meeting.</li> <li>Review schedule and sequence of work for setup activities.</li> <li>Review project plans.</li> <li>Ensure areas of excavation are identified.</li> <li>Ensure Virginia Miss Utility has been called and third party locate is scheduled.</li> <li>Review APP and AHA.</li> </ul>		<ul style="list-style-type: none"> <li>Verify that qualified SSHO is present at active work areas.</li> <li>Verify that pre-existing conditions at the site are photographed.</li> <li>Ensure Virginia Miss Utility and third party locators have marked the site.</li> <li>Ensure E&amp;S Controls are installed per VESCH standards and WP / ESCP requirements.</li> <li>Verify that existing conditions photographs are taken and clearing activity is photographed.</li> <li>Verify access road is installed per Traffic Plan</li> </ul>		<ul style="list-style-type: none"> <li>Continue initial inspections.</li> <li>Verify that site activities are being photographed.</li> <li>Verify above ground/underground utilities have been marked.</li> <li>Inspect E&amp;S Controls and ensure they are maintained and in place until soil disturbance activities are completed.</li> <li>Ensure initial conditions survey is completed.</li> <li>Ensure access road is installed as described in the RAWP.</li> <li>Verify access road is installed per Traffic Plan</li> </ul>	
Clearing Activities	<ul style="list-style-type: none"> <li>Verify that RPM and FEAD have been notified of preparatory meeting.</li> <li>Review schedule and sequence of work for setup activities.</li> <li>Review project plans.</li> <li>Ensure clearing limits are identified.</li> <li>Ensure Virginia Miss Utility has been called and third party locate is scheduled.</li> <li>Verify that the area has been walked/visually inspected for items that could interfere with clearing (utilities, rebar, etc.).</li> <li>Review APP and AHA.</li> </ul>		<ul style="list-style-type: none"> <li>Verify that qualified SSHO is present at active work areas.</li> <li>Ensure Virginia Miss Utility and third party locators have marked the site.</li> <li>Verify that existing conditions photographs are taken and clearing activity is photographed.</li> </ul>		<ul style="list-style-type: none"> <li>Continue initial inspections.</li> <li>Verify that site activities are being photographed.</li> <li>Verify that clearing is conducted per WP; timbers are staged for base removal and small trees and brush are chipped for use as mulch.</li> </ul>	
Excavation of Soil and Debris	<ul style="list-style-type: none"> <li>Verify that RPM and FEAD have been notified of preparatory meeting.</li> <li>Ensure Virginia Miss Utility has been called and third party locate is scheduled.</li> </ul>		<ul style="list-style-type: none"> <li>Verify that qualified SSHO is present at active work areas.</li> </ul>		<ul style="list-style-type: none"> <li>Continue initial inspections.</li> <li>Verify that all visible debris has been removed.</li> </ul>	

**Table 3 - 1 Definable Features of Work**

ACTIVITY	PREPARATORY	DONE	INITIAL	DONE	FOLLOW-UP	DONE
	<ul style="list-style-type: none"> <li>Review schedule and sequence of work for excavation activities.</li> <li>Ensure excavation areas staked out by surveyor.</li> <li>Ensure clean fill is approved.</li> <li>Ensure Dig Permit is obtained.</li> <li>Review APP and applicable AHA.</li> </ul>		<ul style="list-style-type: none"> <li>Ensure Virginia Miss Utility and third party locators have marked the site.</li> <li>Ensure excavation extends to the surveyor's staked points.</li> <li>Ensure that excavated soil/debris is properly transported to containment area.</li> <li>Verify that site activities are being photographed.</li> <li>Verify side slopes are stable.</li> </ul>		<ul style="list-style-type: none"> <li>Ensure post-excavation survey is completed.</li> <li>Verify materials are staged in accordance with work plan.</li> <li>Verify that site activities are being photographed.</li> <li>Ensure excavation limits are captured.</li> <li>Ensure confirmation sample locations are captured.</li> </ul>	
Mechanical Screening of Soil	<ul style="list-style-type: none"> <li>Verify that RPM and FEAD have been notified of preparatory meeting.</li> <li>Review schedule and sequence of work for excavation activities.</li> <li>Review APP and applicable AHA.</li> <li>Verify materials are on hand to level surface and setup screener.</li> <li>Verify waste profiles have been accepted by disposal facilities.</li> </ul>		<ul style="list-style-type: none"> <li>Verify that qualified SSHO is present at active work areas.</li> <li>Verify that site activities are being photographed.</li> <li>Verify that screener is set on level surface.</li> <li>Verify that equipment is working properly.</li> </ul>		<ul style="list-style-type: none"> <li>Continue initial inspections.</li> <li>Ensure soil is mechanically screened to separate cartridges.</li> <li>Verify soil screening occurs while trucks are in place to be loaded via conveyor.</li> <li>Verify spotters are present for loading trucks.</li> <li>Verify cartridges are separated for haz waste disposal.</li> </ul>	
Sampling Activities	<ul style="list-style-type: none"> <li>Verify that RPM and FEAD have been notified of preparatory meeting.</li> <li>Verify Work Plan and supporting documents have been submitted and approved.</li> <li>Review schedule and sequence of work for sampling activities.</li> <li>Review project plans including Sampling and Analysis Plan.</li> <li>Ensure off-site laboratory services have been procured.</li> </ul>		<ul style="list-style-type: none"> <li>Verify that qualified SSHO is present at active work areas.</li> <li>Ensure post-excavation confirmation sample locations staked as shown in work plan drawings.</li> <li>Verify potential backfill sources have been identified.</li> <li>Ensure Sampling and Analysis Plan requirements are being met with regard to sample collection, labeling, and packaging.</li> </ul>		<ul style="list-style-type: none"> <li>Continue initial inspections.</li> <li>Ensure representative samples of potential fill are collected for each type of material from each source.</li> <li>Ensure representative samples of soil/debris to be excavated and disposed are collected from each excavation area.</li> <li>Ensure post-excavation confirmation samples are collected.</li> <li>Verify that site activities are being photographed.</li> </ul>	

**Table 3 - 1 Definable Features of Work**

ACTIVITY	PREPARATORY	DONE	INITIAL	DONE	FOLLOW-UP	DONE
Backfill and Site Restoration	<ul style="list-style-type: none"> <li>Verify that RPM and FEAD have been notified of preparatory meeting.</li> <li>Verify source of fill material has been approved by the Navy.</li> <li>Review schedule and sequence of work for restoration activities.</li> <li>Review APP and applicable AHA.</li> </ul>		<ul style="list-style-type: none"> <li>Verify that qualified SSHO is present at active work areas.</li> <li>Ensure only backfill material from the approved source is used.</li> <li>Ensure backfill placed in (bucket) compacted lifts.</li> <li>Verify that site activities are being photographed.</li> </ul>		<ul style="list-style-type: none"> <li>Continue initial inspections.</li> <li>Verify disturbed areas brought back to original grade and seed/straw are placed.</li> <li>Verify temporary E&amp;S controls are removed.</li> <li>Ensure pre-final and final inspections are performed.</li> <li>Verify that site activities are being photographed.</li> <li>Ensure final site survey is completed.</li> </ul>	
Transportation and Disposal	<ul style="list-style-type: none"> <li>Verify that RPM and FEAD have been notified of preparatory meeting.</li> <li>Review Waste Management Plan.</li> <li>Verify waste characterization samples have been collected and sample results received.</li> <li>Verify waste profiles have been submitted and approved including OSR approval.</li> <li>Review schedule and sequence of work for disposal activities.</li> <li>Review APP and applicable AHA.</li> </ul>		<ul style="list-style-type: none"> <li>Verify that qualified SSHO is present at active work areas.</li> <li>Ensure manifests are completed and signed.</li> <li>Ensure haul vehicles are road worthy and drivers have appropriate license and registration.</li> <li>Verify that site activities are being photographed.</li> </ul>		<ul style="list-style-type: none"> <li>Continue initial inspections.</li> <li>Verify that completed waste manifests or bills of lading are received from the disposal facility.</li> </ul>	
Demobilization	<ul style="list-style-type: none"> <li>Verify that RPM and FEAD have been notified of preparatory meeting.</li> <li>Review schedule and sequence of work for demobilization activities.</li> <li>Review APP and applicable AHA.</li> </ul>		<ul style="list-style-type: none"> <li>Verify that qualified SSHO is present at active work areas.</li> <li>Verify that final conditions at the site are photographed.</li> </ul>		<ul style="list-style-type: none"> <li>Continue initial inspections.</li> <li>Verify that all personnel, equipment, materials, and temporary facilities are removed from the site.</li> <li>Verify that site activities are being photographed.</li> </ul>	

**Abbreviations and Acronyms:**

AHA – Activity Hazard Analysis  
 APP – Accident Prevention Plan  
 E&S – Erosion and Sediment  
 ESCP – Erosion and Sediment Control Plan  
 FEAD – Facility Engineering and Acquisition Division

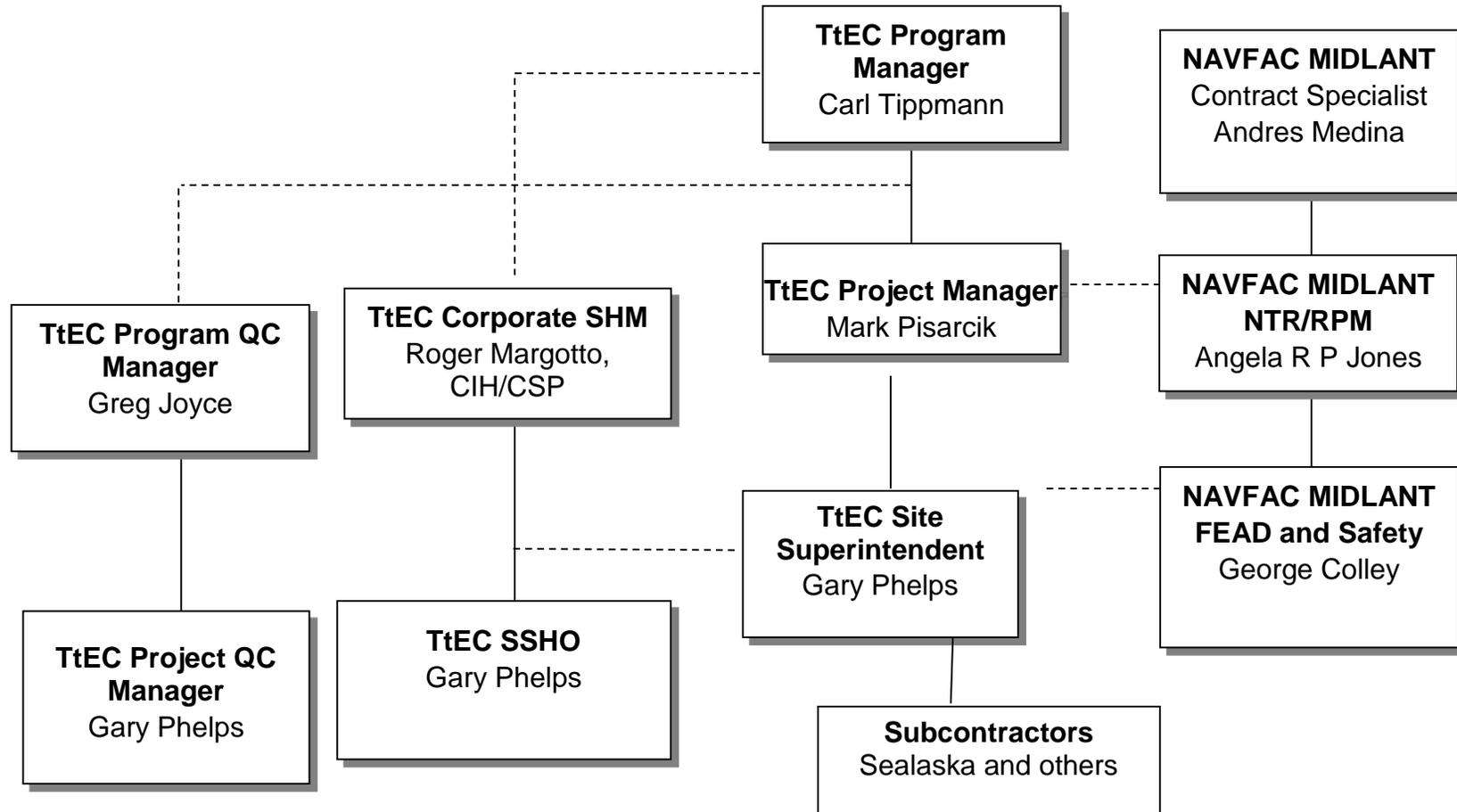
OSR – Off-Site Rule  
 RPM – Remedial Project Manager  
 RAWP – Removal Action Work Plan  
 SSHO – Site Safety and Health Officer  
 VESCH – Virginia Erosion and Sediment Control Handbook

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## **FIGURES**

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Figure 2 - 1 Organizational Chart



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**APPENDIX A**

**DELEGATION OF AUTHORITY LETTER**  
(to be included upon mobilization)

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## **APPENDIX B**

### **RESUMES**

(to be submitted upon request)

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**APPENDIX C**  
**QUALITY CONTROL FORMS**

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TETRA TECH EC, INC.  
NAVY REMEDIAL ACTION CONTRACT (RAC VI)  
CONTRACT NO. N62470-13-D-8007

**DEFICIENCY NOTICE**

TASK ORDER # \_\_\_\_\_ DN # \_\_\_\_\_ DATE \_\_\_\_\_  
LOCATION: \_\_\_\_\_ ROICC / RPM \_\_\_\_\_

**1. Plan, Procedure, Specificaion, or Drawing (Clearly state the requiremet)**

\_\_\_\_\_

**2. Description of Deficiency**

\_\_\_\_\_

QC verification of corrective action required: Yes \_\_\_\_\_ No \_\_\_\_\_

Prepared by: \_\_\_\_\_ Approved by: \_\_\_\_\_

**3. Corrective Action**

\_\_\_\_\_

\_\_\_\_\_  
Organization Signature Date

**4.** Corrective action verified by: \_\_\_\_\_ Date \_\_\_\_\_

Comments:

\_\_\_\_\_

Program Quality Control Manager Date

**TETRA TECH EC, INC.**  
**NAVY REMEDIAL ACTION CONTRACT (RAC VI)**  
**CONTRACT NO. N62470-13-D-8007**

**DESIGN CHANGE NOTICE (DCN)**

TASK ORDER # \_\_\_\_\_ DCN # \_\_\_\_\_ DATE \_\_\_\_\_  
 LOCATION \_\_\_\_\_ ROICC / RPM \_\_\_\_\_

**1. Document to be changed. Identify revision, date, section, drawing, etc.**

**2. Description of Change (Items involved, submit sketch, if applicable):** (Use continuation sheet if necessary)

Engineering "HOLD" placed on all activities in area defined herein pending receipt of formally revised document(s) and / or DCN.  
 Released for construction basis of modifications prescribed by this DCN.

**3. Reason for Change (Attach additional information if needed)**

<b>4. Originator (Print name and sign)</b>	Title	Date
<b>Reviewed by: (Print name and sign)</b>	Title	Date
<b>Task Order Manager (Print name and sign)</b>	Date	<b>Program Quality Manager (Print name and sign)</b>
		Date

TETRA TECH EC, INC.  
NAVY REMEDIAL ACTION CONTRACT (RAC VI)  
CONTRACT NO. N62470-13-D-8007

**DESIGN CLARIFICATION REQUEST**

TASK ORDER # \_\_\_\_\_ DC# \_\_\_\_\_ DATE \_\_\_\_\_

Submitted to: \_\_\_\_\_

1. Document reference. Identify revision, date, section, drawing, etc.

2. Clearly state requirement or describe drawing as shown. (Attach additional info if needed)

3. Information requested or proposed change. (Attach additional information if needed)

4. Response

Does response require an FCR or DCN      YES       NO   
  
FCR       DCN

<b>Task Order Manager (Print name and sign)</b>	<b>Date</b>

**TETRA TECH FW, INCORPORATED**  
**NAVY REMEDIAL ACTION CONTRACT (RAC VI)**  
**CONTRACT NO. N62470-13-D-8007**  
**FIELD CHANGE REQUEST LOG**

Task Order # :	Task Order Manager:	ROICC / RPM:
----------------	---------------------	--------------

FCR No.	DESCRIPTION OF CHANGE	DATE INITIATED	STATUS

**TETRA TECH FW, INCORPORATED**  
**NAVY REMEDIAL ACTION CONTRACT (RAC VI)**  
**CONTRACT NO. N62470-13-D-8007**  
**FIELD CHANGE REQUEST LOG**

Task Order # :	Task Order Manager:	ROICC / RPM:
----------------	---------------------	--------------

FCR No.	DESCRIPTION OF CHANGE	DATE INITIATED	STATUS

**TETRA TECH EC, INC.**  
**NAVY REMEDIAL ACTION CONTRACT (RAC VI)**  
**CONTRACT NO. N62470-13-D-8007**

**FIELD CHANGE REQUEST (FCR)**

TASK ORDER # \_\_\_\_\_ FCR # \_\_\_\_\_ DATE \_\_\_\_\_  
 LOCATION: \_\_\_\_\_ ROICC / RPM \_\_\_\_\_

**1. Document to be changed. Identify revision, date, section, drawing, etc.**

**2. Description of existing requirement and proposed change (Attach sheet if necessary)**

**3. Reason for Change (Attach sheet if necessary)**

<b>4. Originator: (print name and sign)</b>		<b>Title</b>	<b>Date</b>
<b>Reviewed by: (print name and sign)</b>		<b>Title</b>	<b>Date</b>
<b>Site Superintendent (Print name and sign)</b>	<b>Date</b>	<b>Task Order Manager (Print name and sign)</b>	<b>Date</b>
<b>TtEC Program QC Manager (Print Name and Sign)</b>	<b>Date</b>	<b>ROICC Acknowledgement (Print name and sign)</b>	<b>Date</b>

**TETRA TECH EC, INC.**  
**NAVY REMEDIAL ACTION CONTRACT (RAC VI)**  
**CONTRACT NO. N62470-13-D-8007**

**Preparatory Inspection Checklist**

Task Order No.: \_\_\_\_\_  
Definable Feature: \_\_\_\_\_  
NAVFAC SW notification \_\_\_\_\_

Date: \_\_\_\_\_  
Spec Section: \_\_\_\_\_  
48 Hours in Advance Yes \_\_\_\_\_ No \_\_\_\_\_

**I Submittals**

1. Review submittals and/or submittal register. Have all applicable submittals been approved?  
Yes \_\_\_\_\_ No \_\_\_\_\_

If No, what items have not been submitted?  
Comments

2. Are all materials on hand? Yes \_\_\_\_\_ No \_\_\_\_\_

If No, what items are missing?  
Comments

3. Check approved submittals against delivered materials. (This should be done as materials arrives.)  
Comments

**II Material Storage**

Are materials stored properly? Yes \_\_\_\_\_ No \_\_\_\_\_

If No, what actions is taken?

**III Specifications**

1. Review each paragraph of Specification

**TETRA TECH EC, INC.**  
**NAVY REMEDIAL ACTION CONTRACT (RAC VI)**  
**CONTRACT NO. N62470-13-D-8007**

**Preparatory Inspection Checklist**

2. Discuss procedure for accomplishing the work.

3. Clarify any differences.

**IV Preliminary Work and Permits**

Ensure preliminary work is correct and permits are on file.

Yes \_\_\_\_\_

No \_\_\_\_\_

If No, what action is taken?

**V Testing**

1. Identify test to be performed, frequency, and by whom.

2. When required?

3. Where required?

4. Review testing plan.

5. Has test facilities been approved?

**TETRA TECH EC, INC.**  
**NAVY REMEDIAL ACTION CONTRACT (RAC VI)**  
**CONTRACT NO. N62470-13-D-8007**

**Preparatory Inspection Checklist**

VI Safety

1. Review applicable portion of the Task Order Site Health and Safety Plan.

Comments

2. Activity Hazard Analysis approved?

Yes \_\_\_\_\_

No \_\_\_\_\_

VIII Navy comments during meeting.

**TETRA TECH EC, INC.**  
**NAVY REMEDIAL ACTION CONTRACT (RAC VI)**  
**CONTRACT NO. N62470-13-D-8007**

**Preparatory Inspection Checklist**

I. Personnel Present:

	Name	Position	Company / Government
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

(List additional personnel on reverse side)

\_\_\_\_\_  
Site CQC Representative

**TETRA TECH EC, INC.**  
**NAVY REMEDIAL ACTION CONTRACT (RAC VI)**  
**CONTRACT NO. N62470-13-D-8007**

**Initial Phase Inspection Checklist**

Task Order No.: \_\_\_\_\_  
 Definable Feature: \_\_\_\_\_

Date: \_\_\_\_\_  
 Spec Section: \_\_\_\_\_

**I. Personnel Present:**

	Name	Position	Company / Government
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____
8.	_____	_____	_____
9.	_____	_____	_____
10.	_____	_____	_____

(List additional personnel on reverse side)

**II Identify full compliance with procedures identified at preparatory inspection. Coordinate plans, specifications, and submittals.**

Comments:

**III Preliminary Work. Ensure preliminary work is complete and correct. If not, what action is taken?**

Actions:

**IV Establish Levels of Workmanship**

1. Where is the work located? \_\_\_\_\_
2. Is a sample panel required? Yes \_\_\_\_\_ No \_\_\_\_\_
3. Will the initial work be considered as a sample? Yes \_\_\_\_\_ No \_\_\_\_\_  
 (If yes, maintain in present condition as long as possible.)

**V Resolve any differences.**

Comments:

**TETRA TECH EC, INC.**  
**NAVY REMEDIAL ACTION CONTRACT (RAC VI)**  
**CONTRACT NO. N62470-13-D-8007**

**Initial Phase Inspection Checklist**

VI Check Safety

Review job conditions using Site Health and Safety Plan and job hazard analysis.

Comments:

---

Site CQC Representative





TETRA TECH EC, INC.  
 NAVY REMEDIAL ACTION CONTRACT (RAC VI)  
 CONTRACT NO. N62470-13-D-8007

**NONCONFORMANCE REPORT**

TASK ORDER # \_\_\_\_\_ NCR# \_\_\_\_\_ DATE \_\_\_\_\_  
 LOCATION: \_\_\_\_\_ ROICC/RPM \_\_\_\_\_

**1. Plan, Procedure, Specificaion, or Drawing (Clearly state the requiremet)**

**2. Description of Nonconforming Item or Condition**

\_\_\_\_\_

Did nonconforming condition require suspension of work activities Yes  No

If yes, explain requirement to restart work activities: \_\_\_\_\_

\_\_\_\_\_ Prepared by: \_\_\_\_\_ Title \_\_\_\_\_ Date \_\_\_\_\_

**3. Corrective Action**

- use-as-is
- repair
- rework to specificaion
- other - specify: \_\_\_\_\_

Comments:

\_\_\_\_\_

\_\_\_\_\_ Organization \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_

TETRA TECH EC, INC.  
 NAVY REMEDIAL ACTION CONTRACT (RAC VI)  
 CONTRACT NO. N62470-13-D-8007

**NONCONFORMANCE REPORT**

**4. Evaluation of Proposed Disposition**

\_\_\_\_\_  
 Evaluator

\_\_\_\_\_  
 Title

Accept	<input type="checkbox"/>
Accept with comments	<input type="checkbox"/>
Reject	<input type="checkbox"/>
Reject with comments	<input type="checkbox"/>

Comments:

\_\_\_\_\_  
 Signature

\_\_\_\_\_  
 Date

\_\_\_\_\_  
 Evaluator

\_\_\_\_\_  
 Title

Accept	<input type="checkbox"/>
Accept with comments	<input type="checkbox"/>
Reject	<input type="checkbox"/>
Reject with comments	<input type="checkbox"/>

Comments:

\_\_\_\_\_  
 Signature

\_\_\_\_\_  
 Date

**5. Verification**

Verification required

Yes

No

Verified by:

\_\_\_\_\_  
 Signature

\_\_\_\_\_  
 Title

\_\_\_\_\_  
 Date

Approved by:

\_\_\_\_\_  
 Program QC Manager

\_\_\_\_\_  
 Date



**TETRA TECH EC, INC.**  
**NAVY REMEDIAL ACTION CONTRACT (RAC VI)**  
**CONTRACT NO. N62470-13-D-8007**

**SUBMITTAL REGISTER**

Contract Number: N62470-13-D-8007		Project Title: NTCRA at AOC 2, WPNSTA Yorktown - CAX					Location: Williamsburg, VA								
Specification Section Number	SD No and Type of Submittal Material or product	Specification Paragraph Number	Classification / Approval By CO	Govt. or A/E Reviewer	Transmittal Control No.	Planned Submittal Date	Contractor Action			Approving Authority Action				Contracting Officer / Contractor	Remarks
							Action Code	Date of Action	Date FWD to Approving Authority / Date recd. From Contractor	Date FWD to other Reviewer	Date Received from other Reviewer	Action Code	Date of Action		
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)
<b>SD-01 Preconstruction Submittals</b>															
	Baseline Schedule			G											
	Submittal Register			G											
	Site Plan			G											
	Traffic Plan			G											
	Work Plan (includes SWPPP, WMP, and EPP)			G											
	Sampling and Analysis Plan														
	Construction Quality Control Plan			G											
	Accident Prevention Plan			G											
<b>SD-06 Test Reports</b>															
	Laboratory Sample Analysis Reports-Clean Fill			G											
	Laboratory Sample Analysis Reports-Waste Characterization														
	Laboratory Sample Analysis Reports - Post-excavation confirmation														
<b>SD-11 Closeout Submittals</b>															
	Final Schedule			G											
	Survey Data														
	Analytical Data														
	Disposal Documentation														
	Remedial Action Completion Report														

Action Code:                      NR: Not Reviewed                      AN: Approved as Noted                      A: Approved                      RR: Disapproved; Revise and Resubmit                      (Others may be prescribed by Transmittal Form)

**TETRA TECH EC, INC.**  
**NAVY REMEDIAL ACTION CONTRACT (RAC VI)**  
**CONTRACT NO. N62470-13-D-8007**

**QC Inspection Checklist**

Task Order Number:		WE36			Task Order Manager:		Mark Pisarcik			
Project		NTCRA at AOC 2, WPNSTA Yorktown - CAX			Location:		Williamsburg, VA			
Spec. Section	Paragraph No.	Definable Feature of Work	Sub-Task	Quality Objectives to be Verified	Preparatory Phase Report No.	Date	Initial Phase Report No.	Date	Follow-Up Phase Report No.	Date
WP 3.1		<b>Mobilization and Setup</b>								
			Utility Markout	Verify utility locate has been performed for the work area prior to ground disturbance						
			Initial Site Survey	Ensure surveyor is licensed in the Commonwealth of Virginia						
				Verify excavation extents are staked						
				Verify existing site conditions are captured						
			E&S Control Installation	Ensure E&S controls are installed as described in ESCP and in accordance with VESCH standards						
			Access Road Installation	Ensure access road is intalled as described in WP and shown in Site Plan						
WP 3.2		<b>Clearing Activities</b>		Ensure clearing is completed on access road pathway and around excavation/staging areas						
WP 3.3		<b>Excavation of Soil and Debris</b>								
			Preliminary Requirements	Clean fill is approved and dig permit is obtained						
				Ensure initial excavation extents staked by surveyor						
			Excavation	Ensure side slopes of excavation prevent sloughing and cave ins. Assumed slope is 0.75H:1V						
				Visually confirm all debris has been removed, notify Navy if debris extends beyond staked extents						
			Post-Excavation Survey	Ensure post excavation survey completed by surveyor to capture excavation limits. Collect confirmation sample locations						

**TETRA TECH EC, INC.**  
**NAVY REMEDIAL ACTION CONTRACT (RAC VI)**  
**CONTRACT NO. N62470-13-D-8007**

Spec. Section	Paragraph No.	Definable Feature of Work	Sub-Task	Quality Objectives to be Verified	Preparatory Phase Report No.	Date	Initial Phase Report No.	Date	Follow-Up Phase Report No.	Date
			Material Handling	Ensure excavated material either staged within excavation area or transferred to screener without spillage						
WP 3.4		<b>Mechanical Screening of Soil</b>		Ensure screener is placed on level surface						
				Verify cartridges are separated and containerized or placed in contained stockpile area for haz waste disposal						
WP 3.5		<b>Sampling Activities</b>								
SAP			Post-Excavation Confirmation Sampling	Ensure post-excavation confirmation sampling conducted in accordance with the approved SAP						
			Clean Fill Verification Sampling	Ensure clean fill verification sampling completed as outlined in WP section 3.3.2						
			Waste Disposal Characterization Sampling	Ensure waste disposal characterization sampling completed as outlined in WP section 3.3.3 and WMP						
WP 3.6		<b>Site Restoration</b>	Backfill/Seeding	Ensure backfill source is approved and only material from that source is used						
				Ensure fill placed in compacted lifts						
				Ensure all disturbed areas are returned to suitable conditions and seeded/strawed						
			Final As built Survey	Ensure final survey is completed to capture as built conditions						
			Final Inspections	Ensure a pre-final and final inspection are conducted						
WP 3.7		<b>Transportation and disposal</b>		Verify waste profile has been accepted by the disposal facility						
				Ensure haul vehicles are road worthy and have proper license, registration, and insurance						
				Ensure waste manifests are completed, certificates of disposal are received, and both are included in the Post-Removal Report						

**TETRA TECH EC, INC.**  
**NAVY REMEDIAL ACTION CONTRACT (RAC VI)**  
**CONTRACT NO. N62470-13-D-8007**

Spec. Section	Paragraph No.	Definable Feature of Work	Sub-Task	Quality Objectives to be Verified	Preparatory Phase Report No.	Date	Initial Phase Report No.	Date	Follow-Up Phase Report No.	Date
				Ensure waste is disposed of according to their waste type (ie. cartridges disposed of as hazardous waste)						
WP 3.8		<b>Demobilization</b>		Ensure all equipment, materials, and temporary facilities are removed from the site.						
				Ensure equipment is decontaminated as required prior to leaving the site						

### TESTING PLAN AND LOG

CONTRACT NUMBER			PROJECT TITLE AND LOCATION						CONTRACTOR		
NAVFAC MidLant RAC N62470-13-D-8007			NTCRA at AOC 2, WPNSTA Yorktown - CAX, Williamsburg, VA						Tetra Tech EC, Inc		
SPECIFICATION SECTION AND PARAGRAPH NUMBER	SCHEDULE ACTIVITY ID	TEST REQUIRED	ACCREDITED/ APPROVED LAB		SAMPLED BY	TESTED BY	LOCATION OF TEST		DATE COMPLETED	DATE FORWARDED TO CONTR. OFF.	REMARKS
			YES	NO			ON SITE	OFF SITE			
WP 3.5.1 and SAP		Post-Excavation Confirmation Sampling									Collect discreet floor and wall samples per the WP and analyze at an approved laboratory for parameters shown in WP Table 3-1. Compare results to PRGs to determine if additional removal and analysis is required.
WP 3.5.2		Clean Fill Verification Sampling									Collect one representative sample per type of material from each source and analyze at an approved laboratory for parameters listed in Table 3-2 of WP. Results must be submitted to the Navy for approval prior to receiving material on site.
WP 3.5.3		Waste Characterization Sampling									Collect one representative sample from each waste stream and analyze at an approved laboratory for parameters listed in Section 3.5.3 of the WP. Results are used to determine suitable disposal facility/method.

**APPENDIX D**  
**SAMPLING AND ANALYSIS PLAN**

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**SAP Worksheet #1 – Title and Approval Page**

**APPENDIX D**

**FINAL**

**SAMPLING AND ANALYSIS PLAN  
(Field Sampling Plan and Quality Assurance Project Plan)**

**December 2015**

**REMOVAL ACTION AT AOC 2  
NAVAL WEAPONS STATION YORKTOWN – CHEATHAM ANNEX  
WILLIAMSBURG, VIRGINIA**

**Prepared for:**

Department of the Navy  
Naval Facilities Engineering Command, Atlantic  
9742 Maryland Avenue  
Norfolk, VA 23511-3095

**Prepared by:**

Tetra Tech EC, Inc.  
5250 Challedon Drive  
Virginia Beach, Virginia 23462

**Prepared under:**

Contract No. N62470-13-D-8007  
DCN: 4659-WE36-15-0488  
CTO No. WE36

Review Signature:



\_\_\_\_\_  
Greg Joyce  
TtEC Quality Control Program Manager

December 1, 2015

Date

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## **EXECUTIVE SUMMARY**

Tetra Tech EC, Inc. (TtEC) has prepared this Sampling and Analysis Plan (SAP) to provide guidance on sampling, analysis, and quality control (QC) in support of Non-Time Critical Removal Action (NTCRA) at Area of Concern (AOC) 2 at Naval Weapons Station (WPNSTA) Yorktown – Cheatham Annex (CAX) located in Williamsburg, Virginia for the United States Department of the Navy (Navy), Naval Facilities Engineering Command (NAVFAC) Atlantic under a Remedial Action Contract, N62470-13-D-8007, Contract Task Order (CTO) WE36. The quality assurance (QA)/QC elements in this SAP were prepared in accordance with the U.S. Environmental Protection Agency (EPA) Uniform Federal Policy for Quality Assurance Project Plans (EPA 2005) and Requirements for Quality Assurance Project Plans, EPA QA/R-5, QAMS (EPA 2006a) to ensure that all data collected are precise, accurate, representative, complete, and comparable to meet their intended use.

The NTCRA at AOC 2 will include removal action activities for AOC 2 Area 2 (Area 2) containing unused respirator cartridges and empty 55-gallon drums, per the Statement of Work, dated February 4, 2015, and as described in the Engineering Evaluation/Cost Analysis (EE/CA) (CH2MHill 2015). This SAP is an appendix to the Removal Action Work Plan (RAWP) and presents the sampling and analysis activities associated with this project.

The NTCRA will be performed in accordance with the Comprehensive Environmental Restoration, Compensation, and Liability Act (CERCLA), as amended, the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

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## **ATTACHMENTS**

Attachment 1    Laboratory DoD ELAP Accreditation

## Abbreviations and Acronyms

%D	percent difference
%R	percent recovery
µg/kg	micrograms per kilogram
AOC	Area of Concern
bgs	below ground surface
CA	corrective action
CAS	Chemical Abstracts Service
CAX	Cheatham Annex
CCV	continuing calibration verification
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	chain-of-custody
CSO	Caretaker Site Office
CTO	Contract Task Order
CCV	continuing calibration verification
DL	detection limit
DoD	Department of Defense
DQA	data quality assessment
DQO	Data Quality Objective
EDD	electronic data deliverable
EE/CA	Engineering Evaluation/Cost Analysis
ELAP	Environmental Laboratory Accreditation Program
EPA	U.S. Environmental Protection Agency
FCR	Field Change Request
FISC	Fleet and Industrial Supply Center
g	gram
GC/ECD	gas chromatograph/electron capture detector
GC/MS	gas chromatograph/mass spectrometer
ICAL	initial calibration
ICP	inductively coupled plasma
ICV	initial calibration verification
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LOD	limit of detection
LOQ	limit of quantitation
mg/kg	milligrams per kilogram
mL	milliliter
MS/MSD	matrix spike/matrix spike duplicate
N/A	not applicable
NAVFAC	Naval Facilities Engineering Command
NAVY	United States Department of the Navy
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEDD	Navy Electronic Data Deliverable
NTCRA	Non-Time Critical Removal Action

## **Abbreviations and Acronyms** (Continued)

NIRIS	Naval Installation Restoration Information Solution
PARCC	precision, accuracy, representativeness, completeness, and comparability
PCBs	polychlorinated biphenyls
PDF	portable document format
PDS	post-digestion spike
PM	Project Manager
PQCM	Project Quality Control Manager
PRG	preliminary remediation goal
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
QCPM	Quality Control Program Manager
QSM	Quality Systems Manual
RAWP	Removal Action Work Plan
RPD	relative percent difference
RPM	Remedial Project Manager
RSD	relative standard deviation
S&A	Sampling and Analytical
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act of 1986
SDG	sample delivery group
SI	Site Inspection
SIM	selective ion monitoring
SOP	Standard Operating Procedure
SVOCs	semivolatile organic compounds
TtEC	Tetra Tech EC, Inc.
UFP	Uniform Federal Policy
µg/kg	micrograms per kilogram
VOA	volatile organic analysis
VOCs	volatile organic compounds
WPNSTA	Naval Weapons Station

## SAP Worksheet #2 – SAP Identifying Information

**Site Name/Number:** Removal Action at Area of Concern (AOC) 2  
**Contractor Name:** Tetra Tech EC, Inc. (TtEC)  
**Contract Number:** N62470-13-D-8007  
**Contract Title:** Remedial Action Contract VI

1. This SAP was prepared in accordance with the requirements of the Uniform Federal Policy for Quality Assurance Project Plans (EPA 2005) and (EPA Guidance for Quality Assurance Project Plans, EPA QA/G-5, QAMS (EPA 2002).
2. Identify regulatory program: Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).
3. This SAP is a project-specific SAP.
4. List dates of scoping sessions that were held.

Scoping Session	Date
Kick-off meeting with the Navy	August 7, 2015

5. List dates and titles of any SAP documents written for previous site work that are relevant to the current investigation.

Title	Date
None	

6. List organizational partners (stakeholders) and connection with lead organization: EPA Region III Office of Superfund Federal Facilities and Virginia Department of Environmental Quality (VDEQ).
7. Lead organization: Navy
8. If any required SAP elements or required information is not applicable to the project or is provided elsewhere, then note the omitted SAP elements and provide an explanation for its exclusion below:
  - SAP Worksheet #8 (Special Personnel Training Requirements Table) is not applicable for this project as there are no special training requirements associated with sampling.
  - SAP Worksheet #13 (Secondary Data Criteria and Limitations Table) is not applicable for this project as secondary data evaluation is not required.
  - SAP Worksheet #21 (Project Sampling Standard Operating Procedure (SOP) References Table) is not applicable for this project since SOPs are not used and instead procedures are detailed in SAP Worksheet #14.
  - SAP Worksheet #22 (Field Equipment Calibration, Maintenance, Testing, and Inspection Table) is not applicable for this project since field equipment is not required.

## SAP Worksheet #2 – SAP Identifying Information (Continued)

SAP elements and required information that are not applicable to the project are noted below. An explanation is provided above and in the appropriate SAP worksheet(s), as necessary.

UFP-QAPP Worksheet #	Required Information	Crosswalk to Related Information
<b>A. Project Management</b>		
<i>Documentation</i>		
1	Title and Approval Page	
2	SAP Identifying Information	
3	Distribution List	
4	Project Personnel Sign-Off Sheet	
<i>Project Organization</i>		
5	Project Organizational Chart	
6	Communication Pathways	
7	Personnel Responsibilities and Qualifications Table	
8	Special Personnel Training Requirements Table	Not applicable
<i>Project Planning/Problem Definition</i>		
9	Project Planning Session Documentation (including Data Needs tables) Project Scoping Session Participants Sheet	
10	Problem Definition, Site History, and Background	
11	Site-Specific Project Quality Objectives	
12	Measurement Performance Criteria Table for Samples	
13	Sources of Secondary Data and Information Secondary Data Criteria and Limitations Table	Not applicable
14	Summary of Project Tasks	
15	Reference Limits and Evaluation Table	
16	Project Schedule/Timeline Table	
<b>B. Measurement Data Acquisition</b>		
<i>Sampling Tasks</i>		
17	Sampling Design and Rationale	
18	Sampling Locations and Methods/ SOP Requirements Table Sampling Location Map(s)	
19	Analytical Methods/SOP Requirements Table	
20	Field Quality Control Sample Summary Table	
21	Project Sampling SOP References Table	Not applicable
22	Field Equipment Calibration, Maintenance, Testing, and Inspection Table	Not applicable
<i>Analytical Tasks</i>		
23	Analytical SOPs Analytical SOP References Table	
24	Analytical Instrument Calibration Table	

## SAP Worksheet #2 – SAP Identifying Information (Continued)

UFP-QAPP Worksheet #	Required Information	Crosswalk to Related Information
25	Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table	
<i>Sample Collection</i>		
26	Sample Handling System, Documentation Collection, Tracking, Archiving and Disposal Sample Handling Flow Diagram	
27	Sample Custody Requirements, Procedures/SOPs Sample Container Identification Example Chain-of-Custody Form and Seal	
<i>Quality Control Samples</i>		
28	QC Samples Table Screening/Confirmatory Analysis Decision Tree	
<i>Data Management Tasks</i>		
29	Project Documents and Records Table	
30	Analytical Services Table Analytical and Data Management SOPs	
<b>C. Assessment Oversight</b>		
31	Planned Project Assessments Table Audit Checklists	
32	Assessment Findings and Corrective Action Responses Table	
33	QA Management Reports Table	
<b>D. Data Review</b>		
34	Verification (Step I) Process Table	
35	Validation (Steps IIa and IIb) Process Table	
36	Validation (Steps IIa and IIb) Summary Table	
37	Usability Assessment	

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### SAP Worksheet #3 – Distribution List

The following distribution list represents the recipients of the final version of this SAP.

Name of SAP Recipients	Title/Role	Organization	Telephone Number	E-mail Address or Mailing Address
Ms. Angela Jones	Remedial Project Manager (RPM)	NAVFAC MIDLANT	(757) 341-0485	angela.jones1@navy.mil
Mr. Jerry Hoover	Project Manager (PM)	EPA Region III Office of Superfund Federal Facilities	(215) 814-2077	hoover.gerald@epamail.epa.gov
Mr. Wade Smith	PM	Commonwealth of Virginia Department of Environmental Quality Office of Remediation Programs	(804) 698-4125	wade.smith@deq.virginia.gov
Mr. Mark Pisarcik	PM	TtEC	(757) 518-8491 x136 (757) 544-2085 (cell)	mark.pisarcik@tetrattech.com
Mr. Greg Joyce	Quality Control Program Manager (QCPM)	TtEC	(360) 780-0371	greg.joyce@tetrattech.com
Mr. Gary Phelps	Project Quality Control Manager (PQCM)	TtEC	(757) 328-7643 (cell)	gary.phelps@tetrattech.com
Ms. Lisa Bienkowski	Program Chemist	TtEC	(949) 809-5028	lisa.bienkowski@tetrattech.com
Ms. Sabina Sudoko	Project Chemist	TtEC	(949) 809-5022	sabina.sudoko@tetrattech.com
Ms. Andrea Colby	Laboratory Project Manager	Accutest Florida	(386) 615-8479	andreac@accutest.com

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### SAP Worksheet #4 – Project Personnel Sign-Off Sheet

The key personnel listed below will read the final version of this SAP. Their signature and date will be filled in below and included in the project file.

Name	Organization/Title/Role	Signature/E-mail Receipt	SAP Section Reviewed	Date SAP Read
Mr. Mark Pisarcik	TtEC/PM		Entire document	
Mr. Gary Phelps	TtEC/PQCM		Entire document	
Ms. Sabina Sudoko	TtEC/Project Chemist		Entire document	
Ms. Andrea Colby	Accutest Florida/Laboratory Project Manager		Entire document	
To be determined <sup>a</sup>	TtEC/Field Crews		Entire document	

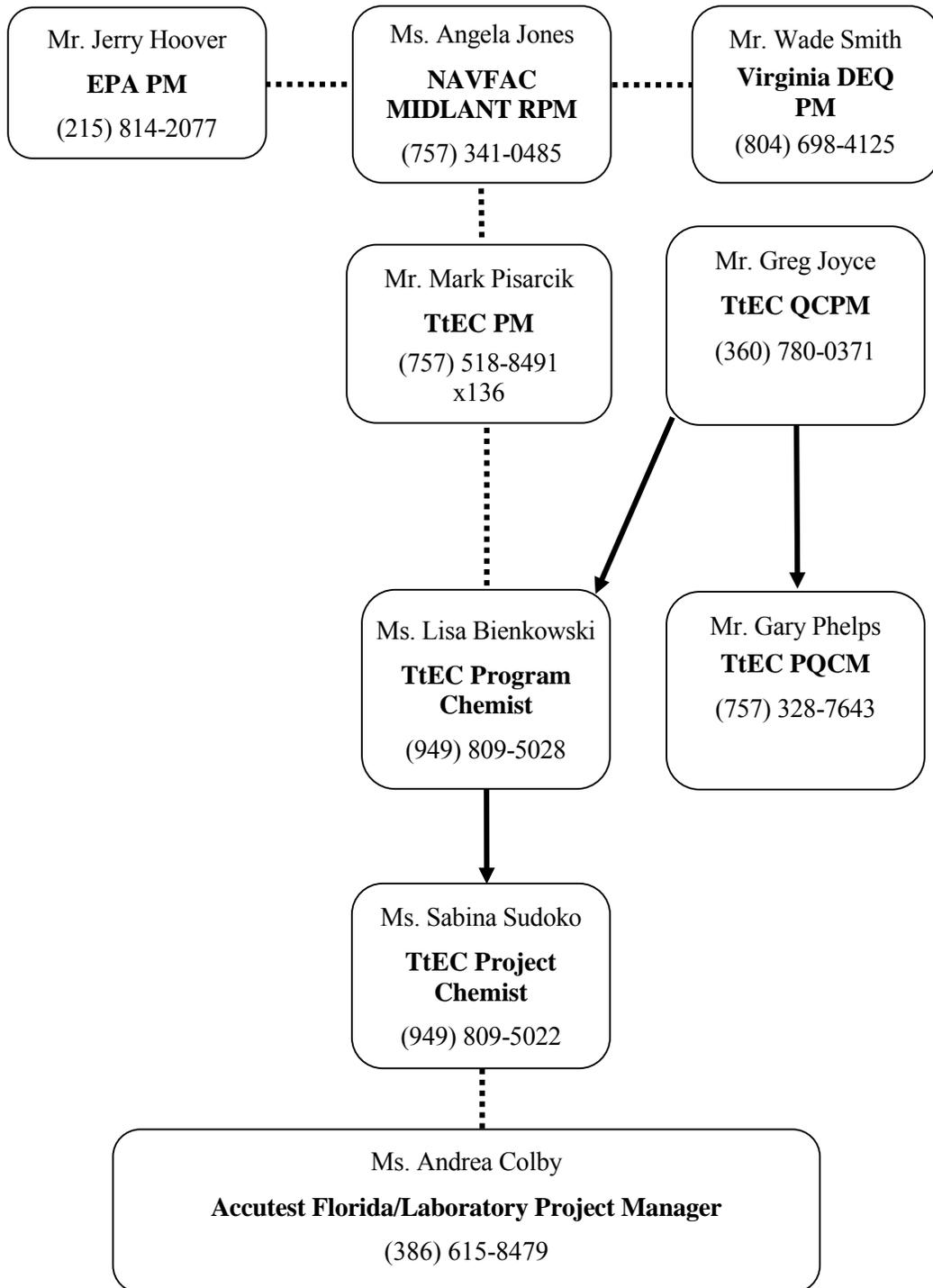
**Notes:**

<sup>a</sup> Field crews include multiple persons and vary from project to project. Therefore, persons identified by the project quality control manager (PQCM) will read the SAP and sign this worksheet as required.

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### SAP Worksheet #5 – Project Organizational Chart

Lines of Authority ————— Lines of Communication



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## SAP Worksheet #6 – Communication Pathways

<b>Communication Drivers</b>	<b>Responsible Affiliation</b>	<b>Name</b>	<b>Phone Number</b>	<b>Procedure</b>
Point of contact for significant changes or corrective actions	NAVFAC MIDLANT RPM	Ms. Angela Jones	(757) 341-0485	If significant changes or corrective actions occur during the project, the RPM will notify the regulators involved in this project.
Point of contact for contractor quality issues	TtEC QCPM	Mr. Greg Joyce	(360) 780-0371	The QCPM is responsible for overseeing program quality control QC, including construction and analytical data acquisition. The QCPM has the authority to suspend project activities if quality standards are not maintained.
Project management	TtEC PM	Mr. Mark Pisarcik	(757) 518-8491 x136	If changes are necessary, the PM is responsible for communicating the changes via phone and/or e-mail to the project staff and is authorized to stop work, if necessary.
SAP review	TtEC QCPM	Mr. Greg Joyce	(360) 780-0371	The SAP will be written by the TtEC Program Chemist and reviewed by the QCPM prior to submittal to the Navy for review.
Notification of nonusable analytical results	TtEC Program Chemist	Ms. Lisa Bienkowski	(949) 809-5028	If significant problems are identified by the laboratory or the project team that impact the usability of the data (i.e., the data are rejected or data quality objectives are not met), the Program Chemist will notify the TtEC PM who will notify the NAVFAC MIDLANT RPM.
Coordination of laboratory supplies for field sampling activities	TtEC Project Chemist	Ms. Sabina Sudoko	(949) 809-5022	The Project Chemist will contact the laboratory to provide all necessary sample containers and appropriate shipping materials (such as coolers and bubble wrap) to be delivered on-site prior to commencement of field sampling activities and throughout the course of the project.

**SAP Worksheet #6 – Communication Pathways (Continued)**

<b>Communication Drivers</b>	<b>Responsible Affiliation</b>	<b>Name</b>	<b>Phone Number</b>	<b>Procedure</b>
Reporting laboratory data quality issues or analytical corrective actions	Accutest Florida Laboratory Project Manager	Ms. Andrea Colby	(615) 345-1115	All data quality issues will be reported in writing by the Laboratory Project Manager to the TtEC Project Chemist within 24 hours. Any corrective actions will be documented and verified by the TtEC Project Chemist.
Field corrective actions	TtEC PQCM	Mr. Gary Phelps	(757) 328-7643	All field corrective actions will be documented in writing by the PQCM who will notify in writing the QCPM and PM. The PM will notify the NAVFAC MIDLANT RPM.
Release of analytical results	TtEC Project Chemist	Ms. Sabina Sudoko	(949) 809-5022	The Project Chemist will review analytical results to verify that the requirements in this SAP have been met prior to releasing the data to the project team for evaluation.
SAP procedure revision during field activities	TtEC Program Chemist	Ms. Lisa Bienkowski	(949) 809-5028	The Program Chemist (or designee) will prepare a Field Change Request for any changes in sampling or analytical procedures that occur due to conditions in the field.
SAP addendums	TtEC Program Chemist	Ms. Lisa Bienkowski	(949) 809-5028	Significant changes to the SAP such as additional scope of work that is not covered in this SAP may require that the Program Chemist prepare an addendum to this SAP.

**SAP Worksheet #7 – Personnel Responsibilities and Qualifications Table**

Name	Title/Role	Organizational Affiliation	Responsibilities
Ms. Angela Jones	RPM	NAVFAC MIDLANT	<ul style="list-style-type: none"> <li>• Performing project management for the Navy</li> <li>• Ensuring that the project scope of work requirements are fulfilled</li> <li>• Overseeing the project cost and schedule</li> <li>• Providing formal technical direction to the TtEC project team, as needed</li> <li>• Acting as lead interface with agencies</li> </ul>
Mr. Mark Pisarcik	PM	TtEC	<ul style="list-style-type: none"> <li>• Coordinating work activities of subcontractors and TtEC personnel, and ensuring that all personnel adhere to the administrative and technical requirements of the project</li> <li>• Monitoring and reporting the progress of work, and ensuring that the project deliverables are completed on time and within project budget</li> <li>• Monitoring the budget and schedule, and notifying the NAVFAC MIDLANT RPM of any changes that may require administrative actions</li> <li>• Ensuring adherence to the quality requirements of the contract, project scope of work, and the QC plans</li> <li>• Ensuring that all work meets the requirements of the technical specifications and complies with applicable codes and regulations</li> <li>• Ensuring that all work activities are conducted in a safe manner in accordance with the Site-Specific Safety and Health Plan, United States Army Corps of Engineers’ Safety and Health Requirements (Engineer Manual 385-1-1), and all applicable Occupational Safety and Health Administration regulations</li> <li>• Serving as the primary contact between the Navy and TtEC for actions and information related to the work and including appropriate TtEC technical personnel in the decision-making</li> <li>• Coordinating satisfactory resolution and completion of evaluation and acceptance report for nonconformance reports</li> <li>• Suspending project activities if standards are not maintained</li> </ul>

**SAP Worksheet #7 – Personnel Responsibilities and Qualifications Table (Continued)**

Name	Title/Role	Organizational Affiliation	Responsibilities
Mr. Greg Joyce	QCPM	TtEC	<ul style="list-style-type: none"> <li>• Establishing and maintaining the Quality Program</li> <li>• Overseeing program QC, including construction and analytical data acquisition</li> <li>• Working directly with the PM and the Navy to ensure implementation of the program QC Plans</li> <li>• Acting as a focal point for coordination for quality matters across all projects and resolving quality issues</li> <li>• Suspending project activities if quality standards are not maintained</li> <li>• Interfacing with the Navy on quality-related items</li> <li>• Conducting field QC audits to ensure project plans are being followed</li> <li>• Performing reviews of audit and surveillance reports conducted by others</li> <li>• Approving any FCRs and reviewing the SAP and any addendums to the SAP</li> </ul>
Ms. Lisa Bienkowski	Program Chemist	TtEC	<ul style="list-style-type: none"> <li>• Developing the SAP and any addendums to the SAP</li> <li>• Implementing contract requirements for data collection</li> <li>• Supporting projects as the technical lead for data collection and analysis</li> <li>• Evaluating and selecting qualified laboratories</li> <li>• Providing oversight of the laboratories with regards to deliverable requirements and monitoring performance of the laboratories</li> <li>• Preparing the Navy Electronic Data Deliverable (NEDD) deliverable for analytical results for upload to the Naval Installation Restoration Information Solution (NIRIS) website</li> <li>• Coordinating submittal of analytical data packages to Navy Administrative Record</li> </ul>

**SAP Worksheet #7 – Personnel Responsibilities and Qualifications Table (Continued)**

Name	Title/Role	Organizational Affiliation	Responsibilities
Ms. Sabina Sudoko	Project Chemist	TtEC	<ul style="list-style-type: none"> <li>• Tracking samples sent to laboratory to ensure laboratory receipt of samples and proper login of samples for analysis</li> <li>• Tracking receipt of analytical results</li> <li>• Reviewing analytical results against requirements in this SAP prior to distribution to the project team</li> </ul>
Ms. Andrea Colby	Laboratory Project Manager	Accutest Florida	<ul style="list-style-type: none"> <li>• Coordinating with the TtEC Project Chemist regarding sample receipt and discrepancies</li> <li>• Ensuring samples are logged in according to the chain-of-custody (COC)</li> <li>• Checking that analytical results are produced in accordance with this SAP and providing those results to the Project Chemist at the expected turnaround time</li> <li>• Ensuring that analytical data packages and electronic deliverable requirements are in accordance with SAP Worksheet #29</li> </ul>

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## **SAP Worksheet #8 – Special Personnel Training Requirements Table**

This worksheet is not applicable to this project as described in SAP Worksheet #2.

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### SAP Worksheet #9 – Project Scoping Session Participants Sheet

<b>Project Name:</b> Removal Action at AOC 2 <b>Projected Date(s) of Sampling:</b> 2016 <b>Project Manager:</b> Mr. Mark Pisarcik		<b>Site Name:</b> AOC 2 <b>Site Location:</b> Naval Weapons Station Yorktown – Cheatham Annex, Williamsburg, VA		
<b>Date of Session:</b> August 7, 2015 <b>Scoping Session Purpose:</b> Kick-off meeting to discuss scope of project with Navy. The purpose of this meeting was to develop a mutual understanding of the work to be performed and the planning documents to be developed and submitted.				
Name	Title	Affiliation	Phone #	E-mail Address
Ms. Angela Jones	RPM	NAVFAC MIDLANT	(757) 341-0485	angela.jones1@navy.mil
Mr. Mark Pisarcik	PM	TtEC	(757) 518-8491 x136	mark.pisarcik@tetrattech.com

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## **SAP Worksheet #10 – Problem Definition**

The main problem defined for this project is: Based on analytical results from previous investigations, potentially unacceptable risks to human health and ecological receptors exist from exposure to surface and subsurface soil within AOC 2, specifically Area 2. Therefore, a NTCRA will be conducted in Area 2 for the removal of contaminated soil and debris at the site.

## **LOCATION AND BACKGROUND INFORMATION**

Cheatham Annex (CAX) is located on the site of the former Penniman Shell Loading Plant (PSLP), a large powder and shell loading facility operated by the DuPont Company during World War I, which closed in 1918 and was dismantled shortly thereafter. Between 1923 and 1943, the property was used for farming or remained idle until CAX was commissioned in 1943 as a satellite unit of the Naval Supply Depot to provide bulk storage facilities and to serve as an assembly and overseas shipping point during World War II. The facility is divided into two separate parcels, with the larger parcel situated along the banks of the York River. Almost all of the activities at CAX (administration, training, maintenance, support, and housing) take place in the larger parcel. The smaller parcel is used mainly as a watershed protection area. In 1987, CAX was designated as the Hampton Roads Navy Recreational Complex. In 1998, control of CAX was transferred from Fleet and Industrial Supply Center (FISC) to Naval Weapons Station (WPNSTA) Yorktown. The current mission of CAX includes supplying Atlantic Fleet ships and providing recreational opportunities to military and civilian personnel.

AOC 2 is a less-than-1-acre wooded site located to the north of Garrison Road, along the southern perimeter of CAX. Historical information indicates that AOC 2 was an unlined, non-permitted disposal area with unknown dates of debris disposal. AOC 2 was identified during site visits by the Navy, EPA, VDEQ, and Baker Environmental, Inc. in late 1997 and early 1998 and consists of several rows of concrete foundation piers that at one time supported a shipping house associated with the former DuPont Company PSLP facility. The majority of structures associated with the PSLP facility were demolished between 1918 and 1925. Grass-covered lanes leading to the site area are likely remnants of former railroad lines that have been removed. Partially buried glass IV bottles (of which the majority were labeled “dextrose”) and unlabeled, empty, 55-gallon drums, respirator cartridges, deer carcasses, and surplus military clothing were discovered in the area. Several mounds also present in the area were suspected to contain buried debris (CH2MHill 2015). Based on the types of debris observed during test trenching activities, AOC 2 was separated into three areas: Areas 1a and 1b contain dextrose IV bottles, Area 2 contains unused respirator cartridges and empty 55-gallon drums, and Area 3 contains surplus military clothing. The CAX Partnering Team agreed the debris in Areas 1a, 1b, and 3 (dextrose IV bottles and military clothing) is not a concern or a source regulated under CERCLA; therefore, it does not require removal. The topography of AOC 2 is predominantly flat. No wetlands or other surface water bodies are located at AOC 2, and there are no nearby water bodies down-gradient of the site. Surface runoff at the site is anticipated to pond and infiltrate into the subsurface or evaporate. In general, the native soil is predominantly composed of clay and silt at AOC 2. As observed during test trenching activities in 2001, a sand fill layer was found to be present over buried materials in some areas of AOC 2 (CH2MHill 2015). The first encountered groundwater underlying AOC 2 is the Cornwallis Cave aquifer, at depths ranging from approximately 22 to 33 feet below ground surface (bgs);

## **SAP Worksheet #10 – Problem Definition (Continued)**

groundwater is expected to flow southeast toward King Creek (CH2MHill 2015). A facility and site location map is included as Figure 1 of the RAWP.

### **SUMMARY OF PREVIOUS ACTIVITIES**

#### **1998 Field Investigation**

In October 1998, a field investigation was completed in Area 1a and Area 2 that included geophysical surveying as well as soil and groundwater sampling via direct-push technology to gain a better understanding of the nature and extent of possible contamination at AOC 2. During the field investigation, twelve 55 gallon drums were observed at the ground surface, partially buried and empty. Based on the results of the geophysical survey, areas of significant magnetic anomalies were delineated that could potentially coincide with buried debris (CH2MHill 2015)

The concentrations of several inorganic constituents in soil exceeded ecological screening criteria and the concentrations of iron indicated a potential (non-carcinogenic) risk to human health. There were no potential unacceptable risks identified for groundwater. It was recommended that the natures of the geophysical anomalies and potential sources of contamination be identified by excavating six shallow test pits in the vicinity of the most significant detected anomalies (CH2MHill 2015).

#### **1999 Field Investigation/2000 Supplemental Test Pit Investigation**

In November 1999, six test pits (A2TP01 through A2TP06) were excavated and sampled at AOC 2 to determine the natures of geophysical anomalies observed during the October 1998 field investigation. Buried materials were encountered in each test pit and included empty drums, dextrose IV bottles, and unopened and unused respirator cartridge canisters. At the two test pits excavated in Area 2 (A2TP01 and A2TP02), empty drums and respirator cartridge canisters were encountered. During this investigation, the debris that was unearthed or collected from the ground surface (including 43 empty 55-gallon drums, 280 empty dextrose IV bottles, and 8,000 pounds of respirator cartridges from Area 2) was disposed offsite; however, the majority of the buried debris was not removed. One respirator cartridge canister was submitted for analysis of full toxicity characteristic leaching procedure (TCLP) parameters and Resource Conservation and Recovery Act characterization. Because cadmium and lead concentrations exceeded TCLP levels, the Navy, in consultation with the EPA and VDEQ, agreed to expand the test pit program to define the extent of buried debris and canisters. In 2000, a supplemental test pit investigation was conducted and a total of 47 exploratory test pits were advanced at AOC 2, with 19 of the test pits located in Area 2. Materials encountered included respirator cartridge canisters, empty drums, dextrose IV bottles, and military clothing. In general, the test pits only extended to the top of debris to avoid unearthing excessive amounts of waste. However, the Area 2 test hole that was advanced in the same location as previous test pit TP02 was advanced to an average of 10 feet bgs over an approximate 25 foot by 15 foot area in order to remove some of the buried respirator cartridges. The cartridges appeared to have been deposited in excavated trenches. The removal of cartridges from the test hole was stopped in late January 2000 due to snow, wet site conditions, and the large volume of waste that had been excavated. Eight thousand pounds of respirator cartridges from Area 2 were removed for offsite disposal. The lateral extent of the buried debris was not completely defined. During this

## **SAP Worksheet #10 – Problem Definition (Continued)**

supplemental test pit investigation, four confirmatory soil samples (A2-CS01 through A2-CS04) were collected. Confirmatory sample analytical results indicated little, if any, impact to soil or groundwater at AOC 2. Based on the results of the supplemental test pit investigation, additional buried dextrose IV bottles, empty drums (some coated with tar), respiratory cartridge canisters, and unused military uniforms (quantities not documented) were observed at AOC 2. A limited geophysical investigation was recommended to delineate the lateral extent of buried respirator cartridge canisters and the location of the eastern perimeter of disposal along Deer Pit Road, and a test pit investigation was recommended to confirm the results of the geophysical investigation (CH2MHill 2015).

### **2001 Trenching Activities**

In 2001, a total of 15 trenches (AOC2TT01 through AOC2TT15) were excavated to confirm the presence or absence of buried respiratory cartridges along Deer Pit Road and to obtain additional information concerning subsurface materials potentially buried at AOC 2. Dextrose IV bottles, clothing, metal debris, and empty 55-gallon drums were observed in the trenches. Three of the trenches (AOC2TT11, AOC2TT13, and AOC2TT14) were excavated in Area 2 and buried drums were observed in two of the three trenches. No samples were collected for laboratory analysis. The horizontal and vertical extents of the dextrose IV bottle dump along Deer Pit Road were delineated and debris was observed to be confined primarily to beneath the road, with some surface debris outside the road area (CH2MHill 2015).

### **2012 Multiple AOC Site Inspection**

Human health and ecological risk screenings of surface soil and subsurface soil samples collected in 1998 and 1999 were conducted and concluded that there may be potentially unacceptable risks to human health and ecological receptors from exposure to surface and subsurface soil within Area 2. As part of the SI, a human health risk screening (HHRS) was performed using the analytical results from the 1998 and 1999 field investigations. Based on the results of the HHRS, arsenic and chromium in surface soil and Aroclor-1260, arsenic, and chromium in subsurface soil have been identified as the human health constituents of potential concern (COPCs) that will require action within Area 2. The SI Report recommended an interim removal action for Area 2 to remove the debris (respirator cartridges and empty 55-gallon drums) and the collection of post-removal soil samples.

### **2014 Site Investigation Supplemental Soil Sampling**

In May 2014, a supplemental soil investigation was conducted outside of Area 2 to augment the SI dataset for the purpose of updating the human health (chromium and arsenic) and ecological (mercury and iron) risk evaluations to determine whether these constituents pose potentially unacceptable risks to human health and the environment, and to determine whether the removal action proposed for Area 2 needs to also address soil “hot spots” outside of Area 2, specifically in Area 1b. The supplemental investigation included the collection of surface soil (0- to 6-inch depth) samples and subsurface soil (various depths) samples via a hand auger in proximity to the historical sample locations outside of Area 2. The site investigation was conducted in accordance with the approved sampling and analysis plan (CH2MHill 2015). Based on the results of the supplemental

## **SAP Worksheet #10 – Problem Definition (Continued)**

soil sampling, no soil “hot spots” outside of Area 2 were identified leaving only Area 2 the focus of the removal action.

## **SAP Worksheet #11 – Project Quality Objectives/Systematic Planning Process Statements**

The Data Quality Objectives (DQOs) specify project objectives, data collection boundaries and limitations, the most appropriate type of data to collect, and the level of acceptable decision error. The quality and quantity of data required to implement environmental removal actions are also defined.

The DQOs, as defined through the seven-step process (EPA 2006b), are as follows:

### **1. State the problem**

The main problem defined for this project is: Based on analytical results from previous investigations, potentially unacceptable risks to human health and ecological receptors exist from exposure to surface and subsurface soil within AOC 2, specifically Area 2. Therefore, a NTCRA will be conducted in Area 2 for the removal of contaminated soil and debris at the site.

In addition to the remedial activities at AOC 2, this SAP also includes the chemical sampling and analysis requirements associated with importing clean fill material.

### **2. Identify the goal of the study**

- a. Are the post-excavation confirmation soil sample results below the criteria listed in SAP Worksheet #15-1?
- b. Are the clean fill soil sample results below the criteria listed in SAP Worksheet #15-2?

### **3. Identify information inputs**

Analytical results generated during this project.

### **4. Define the boundaries of the study**

Temporal boundaries for this project may include seasonal weather related boundaries including rain and snow.

An estimated total of 1,304 cubic yards of material, or 2,000 tons, will be excavated from Area 2. Area 2 consists of a 1,400 ft<sup>2</sup> footprint to be excavated to a depth of 9 feet bgs and a 2,300 ft<sup>2</sup> footprint to be excavated to a depth of 6 feet bgs. Figure 4 of the RAWP illustrates the excavation areas.

### **5. Develop the analytic approach**

- a. If the post-excavation confirmation soil sample results are below the criteria in SAP Worksheet #15-1, then the boundaries of the excavation will be considered defined and the excavation may be backfilled. Otherwise, the Navy will be contacted to approve over-excavation and collection of additional samples.

## **SAP Worksheet #11 – Project Quality Objectives/Systematic Planning Process Statements (Continued)**

- b. If the clean fill soil sample results are below the criteria listed in SAP Worksheet #15-2, then the results will be presented to the Tier I Partnering Team for review prior to use. Otherwise, an additional source will be identified and sampled.

### **6. Specify performance or acceptance criteria**

Field crews will review this SAP prior to collection of samples and sign off on SAP Worksheet #4. Sampling and analytical performance or acceptance criteria are specified in SAP Worksheets #12, 15, and 28.

### **7. Develop the plan for obtaining data**

Post-excavation soil samples will be collected to confirm if the horizontal and vertical extents of the excavations are sufficient. Floor samples will be collected at a frequency of one per 625 ft<sup>2</sup> and sidewall samples at a frequency of one per 50 linear feet. A total of 6 floor samples and 6 sidewall samples are anticipated for all of Area 2 excavations.

For clean fill material, one five-point composite soil sample will be collected per source which includes one sample for general fill and one for topsoil.

## SAP Worksheet #12 – Measurement Performance Criteria Table for Samples

### POST-EXCAVATION SOIL SAMPLES

QC Sample	Analytical Group	Frequency	Data Quality Indicators	Measurement Performance Criteria	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
Field Duplicate	Pesticides PCBs Metals Hexavalent chromium	1 per 10 post-excavation soil samples	Precision	Relative percent difference (RPD) $\leq 30\%$ when detected concentrations > limit of quantitation (LOQ)	S&A
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	Pesticides PCBs Metals Hexavalent chromium	1 per 20 post-excavation soil samples	Precision/Accuracy	Within limits listed for laboratory control limits (LCS) in Appendix C of the DoD QSM 5.0. For analytes not listed in Appendix C, the laboratory will use in-house statistical values.	S&A

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## **SAP Worksheet #13 – Secondary Data Criteria and Limitations Table**

This worksheet is not applicable to this project as described in SAP Worksheet #2.

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## **SAP Worksheet #14 – Summary of Project Tasks**

### **PROJECT TASKS**

A summary of activities performed by TtEC for this project include the following:

- Mobilization and Setup
- Clearing Activities
- Excavation of Soil and Debris
- Mechanical Screening of Soil
- Sampling Activities
- Backfilling and Site Restoration
- Transportation and Disposal of Waste
- Demobilization

### **SAMPLE COLLECTION PROCEDURES**

Personnel will don a new pair of disposable nitrile gloves before collecting discrete samples from each post-excavation confirmation floor or sidewall location. A new, disposable plastic scoop or equivalent will be used to collect a grab sample from the soil surface at each location to place into 1 eight ounce glass jar. The jar will be filled completely with no headspace.

Clean fill samples (from an off-site source) will also be collected using a disposable scoop or equivalent. A five-point composite soil sample will be collected for the general fill and one for the topsoil. Both samples will be analyzed for all of the analyses listed in the SAP Worksheet #18. For the VOCs and TPH-GRO, a discrete sample will be collected from the first location of the five-point composite (since volatile analyses should not be composited). For VOC and TPH-GRO analysis, soil will be collected using a 5 gram Terra Core sampler or equivalent to dispense a 5 gram aliquot into containers listed in SAP Worksheet #19. Soil for the rest of the analyses will be collected by taking two scoops from each of the five points and placing that soil into a gallon size ziplock bag to mix thoroughly. Then soil from that bag will be transferred into 7 eight ounce glass jars to fill jars completely with no headspace.

All samples will be labeled and packaged in accordance with SAP Worksheet #27.

### **DATA MANAGEMENT PROCEDURES**

Field surveying data, logbooks, and COC records will be maintained in the TtEC project file. The field crews will e-mail a copy of the COC records to the TtEC Project Chemist the day any samples are collected and shipped to the laboratory.

Accutest Florida will e-mail analytical results within the turnaround time to the Project Chemist. This submittal will include analytical results and basic QC results (method blanks, LCS, and laboratory duplicate as applicable). The Project Chemist will review prior to distribution to the project team. Following this submittal, the laboratory will submit deliverables as described in SAP Worksheet #29.

## **SAP Worksheet #14 – Summary of Project Tasks (Continued)**

Survey data will be recorded by on-site personnel for all samples locations. Horizontal control information for upload into the database will be captured in the State Plane Coordinate System in feet and vertical control standards will be in mean sea level. The analytical results and survey data will be submitted to the NIRIS website as applicable for this project.

### SAP Worksheet #15-1 – Reference Limits and Evaluation Table

**Matrix:** Soil

**Analytical Group:** Pesticides (Post-excavation samples)

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific limits		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
4,4'-DDT	50-29-3	100	PRG	3.3	3.3	0.83	0.63

**SAP Worksheet #15-1 – Reference Limits and Evaluation Table (Continued)**

**Matrix:** Soil

**Analytical Group:** PCBs (Post-excavation samples)

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific limits		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
Aroclor 1260	11096-82-5	2,400	PRG	17	17	8.3	6.6

**SAP Worksheet #15-1 – Reference Limits and Evaluation Table (Continued)**

**Matrix:** Soil

**Analytical Group:** Metals (Post-excavation samples)

Analyte	CAS Number	Project Action Limit (mg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (mg/kg)	Laboratory-specific limits		
					LOQ (mg/kg)	LOD (mg/kg)	DL (mg/kg)
Arsenic	7440-38-2	6.7	PRG	0.5	0.5	0.25	0.1
Chromium (total)	7440-47-3	120,000	PRG	0.5	0.5	0.1	0.05
Mercury	7439-97-6	0.24	PRG	0.042	0.042	0.017	0.0042

**SAP Worksheet #15-1 – Reference Limits and Evaluation Table (Continued)**

**Matrix:** Soil

**Analytical Group:** Hexavalent Chromium (Post-excavation and clean fill samples)

Analyte	CAS Number	Project Action Limit (mg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (mg/kg)	Laboratory-specific limits		
					LOQ (mg/kg)	LOD (mg/kg)	DL (mg/kg)
Hexavalent chromium	18540-29-9	3.0	PRG	2	2	1.5	0.86

## SAP Worksheet #15-2 – Reference Limits and Evaluation Table

**Matrix:** Soil

**Analytical Group:** VOCs (Clean fill samples)

Analyte	CAS Number	Project Action Limit micrograms per kilogram (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific limits		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
1,1,1-Trichloroethane	71-55-6	640,000	<sup>a</sup>	5	5	2	1.3
1,1,2,2-Tetrachloroethane	79-34-5	600	<sup>a</sup>	5	5	2	1.1
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	76-13-1	910,000	<sup>a</sup>	5	5	3.5	1.5
1,1,2-Trichloroethane	79-00-5	150	<sup>a</sup>	5	5	2	1.3
1,1-Dichloroethane	75-34-3	3,600	<sup>a</sup>	5	5	2	1
1,1-Dichloroethene	75-35-4	23,000	<sup>a</sup>	5	5	2	1.3
1,2-Dibromoethane (EDB)	106-93-4	36	<sup>a</sup>	5	5	2	1
1,2-Dibromo-3-chloropropane	96-12-8	5.3	<sup>a</sup>	5	5	3.5	1.4
1,2-Dichlorobenzene	95-50-1	180,000	<sup>a</sup>	5	5	2	1
1,2-Dichloroethane	107-06-2	460	<sup>a</sup>	5	5	2	1
1,2-Dichloropropane	78-87-5	1,000	<sup>a</sup>	5	5	2	1
1,2,3-Trichlorobenzene	87-61-6	4,900	<sup>a</sup>	5	5	2	1
1,2,4-Trichlorobenzene	120-82-1	5,800	<sup>a</sup>	5	5	2	1
1,4-Dichlorobenzene	106-46-7	2,600	<sup>a</sup>	5	5	2	1
1,4-Dioxane	123-91-1	5,300	<sup>a</sup>	200	200	100	59
2-Butanone	78-93-3	2,700,000	<sup>a</sup>	25	25	10	8.5
2-Hexanone	591-78-6	20,000	<sup>a</sup>	25	25	15	8.2
4-Methyl-2-pentanone	108-10-1	530,000	<sup>a</sup>	25	25	10	5.4

**SAP Worksheet #15-2 – Reference Limits and Evaluation Table (Continued)**

Analyte	CAS Number	Project Action Limit micrograms per kilogram (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific limits		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
Acetone	67-64-1	6,100,000	<sup>a</sup>	50	50	25	15
Benzene	71-43-2	1,200	<sup>a</sup>	5	5	2	1
Bromochloromethane	74-97-5	15,000	<sup>a</sup>	5	5	2	1
Bromodichloromethane	75-27-4	290	<sup>a</sup>	5	5	2	1
Bromoform	75-25-2	67,000	<sup>a</sup>	5	5	2	1
Bromomethane (methyl bromide)	74-83-9	680	<sup>a</sup>	5	5	3.5	2.2
Carbon disulfide	75-15-0	77,000	<sup>a</sup>	5	5	3.5	1.5
Carbon tetrachloride	56-23-5	650	<sup>a</sup>	5	5	2	1
Chlorobenzene	108-90-7	50	<sup>a</sup>	5	5	2	1
Chloroethane	75-00-3	1,400,000	<sup>a</sup>	5	5	3.5	2
Chloroform	67-66-3	320	<sup>a</sup>	5	5	2	1
Chloromethane (methyl chloride)	74-87-3	11,000	<sup>a</sup>	5	5	3.5	2
cis-1,2-Dichloroethene	156-59-2	16,000	<sup>a</sup>	5	5	2	1
cis-1,3-Dichloropropene	10061-01-5	1,800	<sup>a</sup>	5	5	2	1
Cyclohexane	110-82-7	120,000	<sup>a</sup>	5	5	2	1
Dibromochloromethane	124-48-1	730	<sup>a</sup>	5	5	2	1
Dichlorodifluoromethane (Freon-12)	75-71-8	8,700	<sup>a</sup>	5	5	3.5	1.4
Ethylbenzene	100-41-4	50	<sup>a</sup>	5	5	2	1
Isopropylbenzene (cumene)	98-82-8	190,000	<sup>a</sup>	5	5	2	1
Methyl acetate	79-20-9	7,800,000	<sup>a</sup>	25	25	20	9.8
Methyl tert-butyl ether	1634-04-4	47,000	<sup>a</sup>	5	5	2	1.2
Methylene chloride	75-09-2	35,000	<sup>a</sup>	10	10	5	4

**SAP Worksheet #15-2 – Reference Limits and Evaluation Table (Continued)**

Analyte	CAS Number	Project Action Limit micrograms per kilogram (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific limits		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
Styrene	100-42-5	100	<sup>a</sup>	5	5	2	1
Tetrachloroethene	127-18-4	8,100	<sup>a</sup>	5	5	2	1.6
Toluene	108-88-3	50	<sup>a</sup>	5	5	2	1
trans-1,2-Dichloroethene	156-60-5	160,000	<sup>a</sup>	5	5	2	1
trans-1,3-Dichloropropene	10061-02-6	1,800	<sup>a</sup>	5	5	2	1
Trichloroethene	79-01-6	410	<sup>a</sup>	5	5	2	1
Trichlorofluoromethane (Freon-11)	75-69-4	73,000	<sup>a</sup>	5	5	3.5	1.8
Vinyl chloride	75-01-4	59	<sup>a</sup>	5	5	2	1.6
m,p-Xylene	N/A	55,000	<sup>a</sup>	10	10	4	1.1
o-Xylene	95-47-6	65,000	<sup>a</sup>	5	5	2	1
Xylenes (reported as total instead of m,p, and o isomers)	1330-20-7	50	<sup>a</sup>	15	15	6	2.1

### SAP Worksheet #15-2 – Reference Limits and Evaluation Table (Continued)

**Matrix:** Soil

**Analytical Group:** SVOCs (Clean fill samples)

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific limits		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
1,1'-Biphenyl	92-52-4	4,700	a	170	170	33	19
1,2,4,5-Tetrachlorobenzene	95-94-3	1,800	a	170	170	33	17
2,3,4,6-Tetrachlorophenol	58-90-2	20,000	a	170	170	33	17
2,4,5-Trichlorophenol	95-95-4	4,000	a	170	170	33	17
2,4,6-Trichlorophenol	88-06-2	6,200	a	170	170	33	17
2,4-Dichlorophenol	120-83-2	18,000	a	170	170	33	17
2,4-Dimethylphenol	105-67-9	120,000	a	170	170	67	17
2,4-Dinitrophenol	51-28-5	12,000	a	830	830	500	170
2,4-Dinitrotoluene	121-14-2	1,700	a	170	170	33	17
2,6-Dinitrotoluene	606-20-2	360	a	170	170	33	17
2-Chloronaphthalene	91-58-7	630,000	a	170	170	33	19
2-Chlorophenol	95-57-8	7,000	a	170	170	33	17
2-Methylnaphthalene	91-57-6	23,000	a	170	170	33	17
2-Methylphenol (o-cresol)	95-48-7	310,000	a	170	170	33	17
2-Nitroaniline	88-74-4	61,000	a	170	170	67	21
2-Nitrophenol	88-75-5	7,000	a	170	170	33	17
3,3'-Dichlorobenzidine	91-94-1	1,200	a	170	170	67	17

**SAP Worksheet #15-2 – Reference Limits and Evaluation Table (Continued)**

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific limits		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
3/4-Methylphenol (m/p-cresol)	108-39-4/106-44-5	310,000	a	170	170	67	33
4-Chloro-3-methylphenol	59-50-7	620,000	a	170	170	33	17
4-Chloroaniline	106-47-8	2,700	a	170	170	33	17
4-Nitroaniline	100-01-6	25,000	a	170	170	67	17
4-Nitrophenol	100-02-7	7,000	a	830	830	330	130
4,6-Dinitro-2-methylphenol	534-52-1	490	a	330	330	130	67
Acetophenone	98-86-2	780,000	a	170	170	33	18
Atrazine	1912-24-9	2,300	a	170	170	33	18
Benzaldehyde	100-52-7	780,000	a	830	830	330	170
Bis(2-Chloroethoxy)methane	111-91-1	18,000	a	170	170	33	17
Bis(2-Chloroethyl)ether	111-44-4	230	a	170	170	33	17
Bis(2-Chloroisopropyl) ether or 2,2'-Oxybis(1-chloropropane)	108-60-1	4,900	a	170	170	33	17
Bis(2-Ethylhexyl)phthalate	117-81-7	38,000	a	330	330	120	33
Butylbenzylphthalate	85-68-7	280,000	a	170	170	67	33
Caprolactam	105-60-2	3,100,000	a	170	170	67	17
Dibenzofuran	132-64-9	7,200	a	170	170	33	17
Diethylphthalate	84-66-2	100,000	a	330	330	120	33
Dimethylphthalate	131-11-3	200,000	a	170	170	67	33
Di-n-butylphthalate	84-74-2	200,000	a	330	330	120	33
Di-n-octylphthalate	117-84-0	62,000	a	170	170	67	33

**SAP Worksheet #15-2 – Reference Limits and Evaluation Table (Continued)**

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific limits		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
Hexachlorobenzene	118-74-1	330	<sup>a</sup>	170	170	33	17
Hexachlorobutadiene	87-68-3	6,200	<sup>a</sup>	170	170	67	17
Hexachlorocyclopentadiene	77-47-4	10,000	<sup>a</sup>	170	170	67	33
Hexachloroethane	67-72-1	4,300	<sup>a</sup>	170	170	67	17
Isophorone	78-59-1	560,000	<sup>a</sup>	170	170	33	17
Nitrobenzene	98-95-3	5,100	<sup>a</sup>	170	170	33	17
N-nitrosodiphenylamine	86-30-6	20,000	<sup>a</sup>	170	170	67	17
N-nitroso-di-n-propylamine	621-64-7	76	<sup>a</sup>	170 <sup>b</sup>	170	33	17
Pentachlorophenol	87-86-5	990	<sup>a</sup>	830	830	330	130
Phenol	108-95-2	30,000	<sup>a</sup>	170	170	33	17

**SAP Worksheet #15-2 – Reference Limits and Evaluation Table (Continued)**

**Matrix:** Soil

**Analytical Group:** SVOCs SIM \* (Clean fill samples)

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific limits		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
Acenaphthene	83-32-9	20,000	a	33	33	17	13
Acenaphthylene	208-96-8	350,000	a	33	33	17	13
Anthracene	120-12-7	100	a	33	33	17	8.3
Benzo(a)anthracene	56-55-3	150	a	6.7	6.7	3.3	1.7
Benzo(a)pyrene	50-32-8	15	a	6.7	6.7	3.3	1.7
Benzo(b)fluoranthene	205-99-2	150	a	6.7	6.7	3.3	1.7
Benzo(k)fluoranthene	207-08-9	1,500	a	6.7	6.7	3.3	1.7
Chrysene	218-01-9	15,000	a	6.7	6.7	3.3	1.7
Dibenzo(a,h)anthracene	53-70-3	15	a	6.7	6.7	3.3	1.7
Fluoranthene	206-44-0	100	a	33	33	17	8.3
Fluorene	86-73-7	30,000	a	33	33	17	13
Indeno(1,2,3-cd)pyrene	193-39-5	150	a	6.7	6.7	3.3	1.7
Naphthalene	91-20-3	100	a	33	33	17	13
Phenanthrene	85-01-8	100	a	33	33	17	8.3
Pyrene	129-00-0	100	a	33	33	17	8.3

\*Analytes will be reported using a lesser dilution to achieve LOQs listed above.

### SAP Worksheet #15-2 – Reference Limits and Evaluation Table (Continued)

**Matrix:** Soil

**Analytical Group:** Pesticides (Clean fill samples)

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific limits		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
4,4'-DDD	72-54-8	210	<sup>a</sup>	3.3	3.3	0.83	0.67
4,4'-DDE	72-55-9	210	<sup>a</sup>	3.3	3.3	0.83	0.6
4,4'-DDT	50-29-3	210	<sup>a</sup>	3.3	3.3	0.83	0.63
alpha-BHC	319-84-6	85	<sup>a</sup>	1.7	1.7	0.83	0.51
Aldrin	309-00-2	31	<sup>a</sup>	1.7	1.7	0.83	0.51
alpha-Chlordane	5103-71-9	1,800	<sup>a</sup>	1.7	1.7	0.83	0.57
gamma-chlordane	5103-74-2	1,800	<sup>a</sup>	1.7	1.7	0.83	0.58
beta-BHC	319-85-7	300	<sup>a</sup>	1.7	1.7	0.83	0.52
delta-BHC	319-86-8	300	<sup>a</sup>	1.7	1.7	0.83	0.57
Dieldrin	60-57-1	33	<sup>a</sup>	1.7	1.7	0.83	0.62
Endosulfan I	959-98-8	37,000	<sup>a</sup>	1.7	1.7	0.83	0.46
Endosulfan II	33213-65-9	37,000	<sup>a</sup>	1.7	1.7	0.83	0.53
Endosulfan sulfate	1031-07-8	37,000	<sup>a</sup>	3.3	3.3	0.83	0.6
Endrin	72-20-8	1,800	<sup>a</sup>	3.3	3.3	0.83	0.6
Endrin aldehyde	7421-93-4	1,800	<sup>a</sup>	3.3	3.3	0.83	0.52
Endrin ketone	53494-70-5	1,800	<sup>a</sup>	3.3	3.3	0.83	0.59
gamma-BHC (Lindane)	58-89-9	560	<sup>a</sup>	1.7	1.7	0.83	0.56
Heptachlor	76-44-8	120	<sup>a</sup>	1.7	1.7	0.83	0.47
Heptachlor epoxide	1024-57-3	59	<sup>a</sup>	1.7	1.7	0.83	0.58

**SAP Worksheet #15-2 – Reference Limits and Evaluation Table (Continued)**

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific limits		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
Methoxychlor	72-43-5	31,000	<sup>a</sup>	3.3	3.3	1.7	0.63
Toxaphene	8001-35-2	480	<sup>a</sup>	83	83	41	33

**SAP Worksheet #15-2 – Reference Limits and Evaluation Table (Continued)**

**Matrix:** Soil

**Analytical Group:** PCBs (Clean fill samples)

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific limits		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
Aroclor 1016	12674-11-2	400	a	17	17	8.3	6.6
Aroclor 1221	11104-28-2	150	a	17	17	13	8.3
Aroclor 1232	11141-16-5	150	a	17	17	13	8.3
Aroclor 1242	53469-21-9	240	a	17	17	8.3	6.6
Aroclor 1248	12672-29-6	240	a	17	17	8.3	6.6
Aroclor 1254	11097-69-1	110	a	17	17	8.3	6.6
Aroclor 1260	11096-82-5	240	a	17	17	8.3	6.6

**SAP Worksheet #15-2 – Reference Limits and Evaluation Table (Continued)**

**Matrix:** Soil

**Analytical Group:** Herbicides (Clean fill samples)

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific limits		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
2,4,5-T	93-76-5	62,000	a	3.3	3.3	1.7	0.77
2,4,5-TP (Silvex)	93-72-1	49,000	a	3.3	3.3	1.7	0.77
2,4-D	94-75-7	69,000	a	33	33	17	9.9
2,4-DB	94-82-6	49,000	a	33	33	17	8.7
Dalapon	75-99-0	180,000	a	170	170	66	33
Dicamba	1918-00-9	180,000	a	3.3	3.3	1.7	1.4
Dinoseb	88-85-7	6,200	a	83	83	33	17
MCPA	94-74-6	3,100	a	3300	3300	1700	1300
MCPD	93-65-2	6,200	a	3300	3300	1700	1400

### SAP Worksheet #15-2 – Reference Limits and Evaluation Table (Continued)

**Matrix:** Soil

**Analytical Group:** Explosives (Clean fill samples)

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific limits		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
1,3,5-Trinitrobenzene	99-35-4	220,000	a	100	100	50	40
1,3-Dinitrobenzene	99-65-0	620	a	100	100	50	40
2,4,6-Trinitrotoluene	118-96-7	3,600	a	100	100	50	40
2-Amino-4,6-dinitrotoluene	35572-78-2	15,000	a	100	100	50	40
2-Nitrotoluene	88-72-2	3,200	a	100	100	50	40
3-Nitrotoluene	99-08-1	620	a	100	100	50	40
4-Amino-2,6-dinitrotoluene	19406-51-0	15,000	a	100	100	50	40
4-Nitrotoluene	99-99-0	25,000	a	100	100	50	40
HMX	2691-41-0	380,000	a	100	100	50	40
Nitroglycerin	55-63-0	620	a	1000 <sup>b</sup>	1000	500	250
PETN	78-11-5	12,000	a	1000	1000	500	250
RDX	121-82-4	6,000	a	100	100	50	40
Tetryl	479-45-8	12,000	a	100	100	50	40

**SAP Worksheet #15-2 – Reference Limits and Evaluation Table (Continued)**

**Matrix:** Soil

**Analytical Group:** TPH-GRO/DRO/ORO (Clean fill samples)

Analyte	CAS Number	Project Action Limit (mg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (mg/kg)	Laboratory-specific limits		
					LOQ (mg/kg)	LOD (mg/kg)	DL (mg/kg)
TPH-GRO (C6-C10)	N/A	50 (total TPH)	a	5	5	2.5	2.5
TPH-DRO (C10-C28)	N/A		a	6.3	6.3	5	3.8
TPH-ORO (C28-C40)	N/A		a	6.3	6.3	5	3.8

### SAP Worksheet #15-2 – Reference Limits and Evaluation Table (Continued)

**Matrix:** Soil

**Analytical Group:** Metals (Clean fill samples)

Analyte	CAS Number	Project Action Limit (mg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (mg/kg)	Laboratory-specific limits		
					LOQ (mg/kg)	LOD (mg/kg)	DL (mg/kg)
Aluminum	7429-90-5	See Table 1	<sup>a</sup>	10	10	2.5	1.75
Antimony	7440-36-0	See Table 1	<sup>a</sup>	1	1	0.25	0.065
Arsenic	7440-38-2	See Table 1	<sup>a</sup>	0.5	0.5	0.25	0.1
Barium	7440-39-3	See Table 1	<sup>a</sup>	10	10	0.1	0.05
Beryllium	7440-41-7	See Table 1	<sup>a</sup>	0.25	0.25	0.05	0.025
Cadmium	7440-43-9	See Table 1	<sup>a</sup>	0.2	0.2	0.05	0.025
Calcium	7440-70-2	See Table 1	<sup>a</sup>	250	250	5	2.5
Chromium	7440-47-3	See Table 1	<sup>a</sup>	0.5	0.5	0.1	0.05
Cobalt	7440-48-4	See Table 1	<sup>a</sup>	2.5	2.5	0.05	0.025
Copper	7440-50-8	See Table 1	<sup>a</sup>	1.25	1.25	0.1	0.05
Iron	7439-89-6	See Table 1	<sup>a</sup>	15	15	2.5	0.85
Lead	7439-92-1	See Table 1	<sup>a</sup>	1	1	0.2	0.05
Magnesium	7439-95-4	See Table 1	<sup>a</sup>	250	250	5	1.8
Manganese	7439-96-5	See Table 1	<sup>a</sup>	0.75	0.75	0.05	0.025
Mercury	7439-97-6	See Table 1	<sup>a</sup>	0.042	0.042	0.017	0.0042
Nickel	7440-02-0	See Table 1	<sup>a</sup>	2	2	0.05	0.025
Potassium	7440-09-7	See Table 1	<sup>a</sup>	500	500	25	10
Selenium	7782-49-2	See Table 1	<sup>a</sup>	1	1	0.25	0.12
Silver	7440-22-4	See Table 1	<sup>a</sup>	0.5	0.5	0.1	0.041

**SAP Worksheet #15-2 – Reference Limits and Evaluation Table (Continued)**

Analyte	CAS Number	Project Action Limit (mg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (mg/kg)	Laboratory-specific limits		
					LOQ (mg/kg)	LOD (mg/kg)	DL (mg/kg)
Sodium	7440-23-5	See Table 1	<sup>a</sup>	500	500	100	25
Thallium	7440-28-0	See Table 1	<sup>a</sup>	0.5	0.5	0.25	0.055
Vanadium	7440-62-2	See Table 1	<sup>a</sup>	2.5	2.5	0.05	0.025
Zinc	7440-66-6	See Table 1	<sup>a</sup>	1	1	0.25	0.15

**SAP Worksheet #15-2 – Reference Limits and Evaluation Table (Continued)**

**Matrix:** Soil

**Analytical Group:** Cyanide (Clean fill samples)

Analyte	CAS Number	Project Action Limit (mg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (mg/kg)	Laboratory-specific limits		
					LOQ (mg/kg)	LOD (mg/kg)	DL (mg/kg)
Cyanide	57-12-5	See Table 1	<sup>a</sup>	0.12	0.12	0.06	0.06

**Notes:**

Soil analytical results will be reported as dry-weight corrected. Non-detected results will be reported by the laboratory with a “U” qualifier at the LOD. Results between the DL and LOQ will be reported as “J” flagged as estimated.

- <sup>a</sup> The project action limits for clean fill material are from CH2MHill as agreed upon by the CAX Tier I Partnering Team. For metals, see table 1 that follows for multiple comparison criteria that will be used.
- <sup>b</sup> The project action limit listed is below the project quantitation limit goal or laboratory LOQ but is above the laboratory DL. Since results detected between the DL and LOQ will be reported as estimated with a J flag, the data can still be evaluated against the project action limit.

**SAP Worksheet #15-2 – Reference Limits and Evaluation Table (Continued)**

**Table 1: Clean Fill Criteria for Metals (All units in mg/kg)**

Chemical Name	CLEAN CAX 95% UTL BKG SB	CLEAN CAX 95% UTL BKG SS	Residential Soil RSL	BTAG (EPA Region 3 Eco Protective Backfill Value)	Backfill Screening Criterion*	Backfill Screening Criterion, Including Background
Aluminum	13,000	12,200	7,700	pH < 5.5	7,700	13,000
Antimony	--	11.0	3.1	2.7	2.7	11.0
Arsenic	5.54	6.36	0.67	18	0.67	6.36
Barium	84.5	52.9	1,500	330	330	330
Beryllium	0.52	0.587	16	40	16	16
Cadmium	--	1.50	7	3.6	3.6	3.6
Calcium	2,380	2,290	--	--	--	2,380
Chromium	33.7	18.2	0.3	260	0.3	33.7
Cobalt	5.18	9.93	2.3	13	2.3	9.93
Copper	3.17	4.25	310	70	70	70.0
Cyanide	2.70	--	2.1	5	2.1	2.70
Iron	32,000	19,900	5,500	2,000	2,000	32,000
Lead	8.79	17.4	400	110	110	110
Magnesium	1,120	1,070	--	--	--	1,120
Manganese	176	324	180	220	180	324
Mercury	0.14	0.111	2.3	0.00051	0.00051	0.14
Nickel	17.6	9.52	150	38	38	38.0
Potassium	901	708	--	--	--	901
Selenium	0.64	0.51	39	0.5	0.5	0.64
Silver	1.10	2.10	39	42	39	39.0
Sodium	811	521	--	--	--	811
Thallium	--	--	0.078	1.00	0.078	0.078
Vanadium	48.3	27.9	39	78	39	48.3
Zinc	28	26.5	2,300	120	120	120

\* Backfill Screening Criterion if the background UTL is exceeded

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## **SAP Worksheet #16 – Project Schedule/Timeline Table**

The project schedule is presented in Appendix A of the RAWP.

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## **SAP Worksheet #17 – Sampling Design and Rationale**

Sampling activities shall include post-excavation confirmation sampling, clean fill verification sampling, and waste disposal characterization sampling. Waste characterization sampling is discussed in Section 3 of the RAWP.

### **Post- Excavation Confirmation Sampling**

Before backfilling of excavations at Area 2 in AOC 2 occurs, discrete post-excavation soil samples will be collected to confirm if the horizontal and vertical extents of the excavations are sufficient. Floor samples will be collected at a frequency of one per 625 ft<sup>2</sup> and sidewall samples at a frequency of one per 50 linear feet. Sidewall samples will be collected within 0-2 feet bgs. A total of 6 floor samples and 6 sidewall samples are anticipated; however, additional samples may be required if the excavation area increases from its' initial limits. Samples will be analyzed for pesticides (4,4-DDT), PCBs (Aroclor 1260), metals (arsenic, total chromium, and mercury), and hexavalent chromium.

### **Clean Fill Verification Sampling**

Clean fill verification sampling will be performed prior to importing any backfill materials to the site. One five-point composite sample will be collected for each type of material which includes one sample for general fill and one for topsoil from each potential source. Samples will be shipped to an off-site laboratory for analysis parameters indicated in SAP Worksheet #18.

Upon receipt of the laboratory analytical report for each clean fill verification sample, a borrow source assessment report will be prepared and submitted to the Tier I Partnering Team for review. The report will include: type of material; proposed use of material; name and address of borrow source; quantity available; physical description and origin of the representative material; and a data summary table comparing the results to the established maximum concentrations agreed upon by the Tier I Partnering Team and provided in SAP Worksheet #15-2. Borrow material will not be imported to the site until approved by the Tier I Partnering Team.

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**SAP Worksheet #18 – Sampling Locations and Methods/SOP Requirements Table**

**POST-EXCAVATION SOIL SAMPLES**

Sampling Location/ ID Number	Matrix	Depth (feet)	Analytical Group	Number of Samples	Sampling SOP Reference
POSTEX-AOC2-FL-01 POSTEX-AOC2-FL-02 POSTEX-AOC2-FL-03 POSTEX-AOC2-FL-04 POSTEX-AOC2-FL-05 POSTEX-AOC2-FL-06 POSTEX-AOC2-FL-D06 (field duplicate) POSTEX-AOC2-SD-01 POSTEX-AOC2-SD-02 POSTEX-AOC2-SD-03 POSTEX-AOC2-SD-04 POSTEX-AOC2-SD-D04 (field duplicate) POSTEX-AOC2-SD-05 POSTEX-AOC2-SD-06	Soil	0-2 for sidewalls; floor depth will be dependent on total end depth of excavations	Pesticides PCBs Metals Hexavalent chromium	One sample per location; total of 12 samples plus 2 field duplicates	SAP Worksheet #14

**SAP Worksheet #18 – Sampling Locations and Methods/SOP Requirements Table (Continued)**

**CLEAN FILL SOIL (OFF-SITE SOURCE)**

Sampling Location/ ID Number	Matrix	Depth (feet)	Analytical Group	Number of Samples	Sampling SOP Reference
GENERALFILL-01 TOPSOIL-01	Soil	Not applicable	VOCs SVOCs SVOCs SIM Pesticides PCBs Herbicides Explosives TPH-GRO/DRO/ORO Metals Hexavalent chromium Cyanide	One sample per source	SAP Worksheet #14

**SAP Worksheet #19 – Analytical SOP Requirements Table**

Matrix	Analytical Group	Analytical and Preparation Method/SOP Reference	Containers	Sample Volume	Preservation Requirements (chemical, temperature, light protected)	Maximum Holding Time (preparation/analysis)
<b>POST-EXCAVATION SOIL SAMPLES</b>						
Soil	Pesticides	EPA 8081B SOP GC015	1 eight ounce glass jar	30 grams	4 ± 2 °C	14 days to extract/40 days to analyze
Soil	PCBs	EPA 8082A SOP GC014		30 grams	4 ± 2 °C	14 days to extract/40 days to analyze
Soil	Metals	EPA 6010C/7471B SOP MET100/ SOP MET105		2 grams 0.5 grams	4 ± 2 °C	180 days 28 days
Soil	Hexavalent chromium	EPA 7196A SOP GN171		15 grams	4 ± 2 °C	30 days to prep/7 days to analyze

**SAP Worksheet #19 – Analytical SOP Requirements Table (Continued)**

Matrix	Analytical Group	Analytical and Preparation Method/SOP Reference	Containers	Sample Volume	Preservation Requirements (chemical, temperature, light protected)	Maximum Holding Time (preparation/analysis)	
<b>CLEAN FILL SAMPLES</b>							
Soil	VOCs	EPA 8260B/SOP MS005	7 eight ounce glass jars	5 gram aliquot from Terra Core sampler into the following: two 40-milliliter (mL) VOA vial with deionized water; one 40-mL VOA vial with methanol	5 grams soil per vial	4 ± 2 °C	48 hours to freeze/14 days to analyze
Soil	TPH-GRO	EPA 8015C/SOP GC010		5 gram aliquot from Terra Core sampler into the following: two 40-milliliter (mL) VOA vial with deionized water; one 40-mL VOA vial with methanol	5 grams soil per vial	4 ± 2 °C	48 hours to freeze/14 days to analyze
Soil	SVOCs	EPA 8270D/SOP MS006		30 grams	4 ± 2 °C	14 days to extract/40 days to analyze	
Soil	SVOCs SIM	EPA 8270D SIM/SOP MS008		30 grams	4 ± 2 °C	14 days to extract/40 days to analyze	
Soil	Pesticides	EPA 8081B/SOP GC015		30 grams	4 ± 2 °C	14 days to extract/40 days to analyze	
Soil	PCBs	EPA 8082A/SOP GC014		30 grams	4 ± 2 °C	14 days to extract/40 days to analyze	
Soil	Herbicides	EPA 8151A/SOP GC031		30 grams	4 ± 2 °C	14 days to extract/40 days to analyze	
Soil	Explosives	EPA 8330B/SOP GC034		10 grams	4 ± 2 °C	14 days to extract/40 days to analyze	
Soil	TPH-DRO/ORO	EPA 8015C/SOP GC011		30 grams	4 ± 2 °C	14 days to extract/40 days to analyze	
Soil	Metals	EPA 6010C/SOP MET100 EPA 7471B/SOP MET105		2 grams 0.5 grams	4 ± 2 °C 4 ± 2 °C	180 days Mercury is 28 days	
Soil	Hexavalent chromium	EPA 7196A/SOP GN171		15 grams	4 ± 2 °C	30 days to prep/7 days to analyze	
Soil	Cyanide	EPA 9012B/SOP GN115		1 gram	4 ± 2 °C	14 days to analysis	

**SAP Worksheet #20 – Field Quality Control Sample Summary Table**

Matrix	Analytical Group	No. of Sampling Locations	No. of Field Duplicates	No. of MS/MSDs	No. of Source Blanks	No. of Equipment Blanks	No. of VOA Trip Blanks	Total No. of Samples to Lab
<b>POST-EXCAVATION SOIL SAMPLES</b>								
Soil	Pesticides	12	2	1	0	0	0	15
Soil	PCBs	12	2	1	0	0	0	15
Soil	Metals	12	2	1	0	0	0	15
Soil	Hexavalent chromium	12	2	1	0	0	0	15
<b>CLEAN FILL SAMPLES</b>								
Soil	VOCs	2	0	0	0	0	0	2
Soil	SVOCs and SVOCs SIM	2	0	0	0	0	0	2
Soil	SVOCs SIM	2	0	0	0	0	0	2
Soil	Pesticides	2	0	0	0	0	0	2
Soil	PCBs	2	0	0	0	0	0	2
Soil	Herbicides	2	0	0	0	0	0	2
Soil	Explosives	2	0	0	0	0	0	2
Soil	TPH-GRO/DRO/ORO	2	0	0	0	0	0	2
Soil	Metals	2	0	0	0	0	0	2
Soil	Hexavalent chromium	2	0	0	0	0	0	2
Soil	Cyanide	2	0	0	0	0	0	2

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## **SAP Worksheet #21 – Project Sampling SOP References Table**

This worksheet is not applicable to this project as described in SAP Worksheet #2.

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## **SAP Worksheet #22 – Field Equipment Calibration, Maintenance, Testing, and Inspection Table**

This worksheet is not applicable to this project as described in SAP Worksheet #2.

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**SAP Worksheet #23 – Analytical SOP References Table**

<b>Lab SOP Number <sup>a</sup></b>	<b>Title, Revision Date, and/or Number</b>	<b>Definitive or Screening Data</b>	<b>Matrix and Analytical Group</b>	<b>Instrument</b>	<b>Organization Performing Analysis</b>	<b>Modified for Project Work? (Y/N)</b>
SOP MS005	GC/MS Volatiles by SW846 Method 8260B Revision May 2014	Definitive	Soil VOCs	GC/MS	Accutest Florida	N
SOP MS006	GC/MS Semivolatiles by SW846 Method 8270D, Revision May 2014	Definitive	Soil SVOCs	GC/MS	Accutest Florida	N
SOP MS008	GC/MS Semivolatiles SW846 Method 8270D SIM, Revision May 2014	Definitive	Soil SVOCs SIM	GC/MS	Accutest Florida	
SOP GC015	Analysis of Chlorinated Pesticides By Gas Chromatography, Electron Capture Detector SW846 8081B, Revision September 2014	Definitive	Soil Pesticides	GC/ECD	Accutest Florida	N
SOP GC014	Analysis of Polychlorinated Biphenyls by Gas Chromatography, Electron Capture Detector SW846 8082A, Revision September 2014	Definitive	Soil PCBs	GC/ECD	Accutest Florida	N
SOP GC031	Analysis of Chlorinated Herbicides By Gas Chromatography, Electron Capture Detector SW846 8151A, Revision September 2014	Definitive	Soil Herbicides	GC/ECD	Accutest Florida	N
SOP GC034	Analysis of Nitroaromatics, Nitramines, and Nitrate Esters by HPLC Method 8330B, Revision September 2014	Definitive	Soil Explosives	HPLC, UV	Accutest Florida	N
SOP GC010	Analysis of Gasoline Range Organics by Gas Chromatography using Flame Ionization Detector, Revision September 2014	Definitive	Soil TPH-GRO	GC/FID	Accutest Florida	N
SOP GC011	Analysis of Diesel Range Organics by Gas Chromatography using Flame Ionization Detector, Revision September 2014	Definitive	Soil TPH-DRO/ORO	GC/FID	Accutest Florida	N

**SAP Worksheet #23 – Analytical SOP References Table (Continued)**

<b>Lab SOP Number <sup>a</sup></b>	<b>Title, Revision Date, and/or Number</b>	<b>Definitive or Screening Data</b>	<b>Matrix and Analytical Group</b>	<b>Instrument</b>	<b>Organization Performing Analysis</b>	<b>Modified for Project Work? (Y/N)</b>
SOP MET100	Metals by Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES) Technique, SW846 6010B/EPA 200.7, Revision September 2014	Definitive	Soil Metals	ICP-AES	Accutest Florida	N
SOP MET105	Mercury Analysis in Soil/Sediment by Manual Cold Vapor Technique Methods SW846 7471B, Revision August 2013	Definitive	Soil Mercury	Cold vapor analyzer	Accutest Florida	N
SOP GN171	Hexavalent Chromium (Soils) by SW846 7196A, Revision October 2013	Definitive	Soil Hexavalent chromium	Spectrophotometer	Accutest Florida	N
SOP GN115	Cyanide, Total, Revision September 2014	Definitive	Soil Total Cyanide	Lachat QuikChem	Accutest Florida	N

**Notes:**

<sup>a</sup> Analytical SOP revision number and date listed are current as of the date this SAP was published.

**SAP Worksheet #24 – Analytical Instrument Calibration Table**

<b>Instrument</b>	<b>Calibration Procedure</b>	<b>Frequency of Calibration</b>	<b>Acceptance Criteria</b>	<b>Corrective Action (CA)</b>	<b>Person Responsible for CA</b>	<b>SOP Reference</b>
GC/MS	Initial Calibration (ICAL), minimum 5 points. Accutest routinely analyzes 6 points.	Instrument receipt, instrument change (new column, source cleaning, etc.), when continuing calibration verification (CCV) is out of criteria.	Follow requirements in Appendix B of DoD QSM 5.0	Repeat calibration	Accutest Florida Analyst	SOP MS005
GC/MS	Initial Calibration Verification (ICV)	Once after each initial calibration	The percent recovery ( %R) must be within 80-120% for all target compounds	Correct problem and verify second source standard. Rerun second source verification. If that fails, correct problem and repeat ICAL.	Accutest Florida Analyst	SOP MS005
GC/MS	CCV	Daily, before sample analysis, and every 12 hours of analysis time	The percent recovery ( %R) must be within 80-120% for all target compounds	If the %D $\geq$ 20% and sample results are <Project LOQ, report with qualification. Otherwise, reanalyze all samples analyzed since the last successful CCV. Follow procedures in DoD QSM 5.0. Repeat ICAL if necessary	Accutest Florida Analyst	SOP MS005

**SAP Worksheet #24 – Analytical Instrument Calibration Table (Continued)**

<b>Instrument</b>	<b>Calibration Procedure</b>	<b>Frequency of Calibration</b>	<b>Acceptance Criteria</b>	<b>Corrective Action (CA)</b>	<b>Person Responsible for CA</b>	<b>SOP Reference</b>
GC/MS	ICAL, minimum 5 points. Accutest routinely analyzes 6 points.	Instrument receipt, instrument change (new column, source cleaning, etc.), when continuing calibration verification (CCV) is out of criteria.	Follow requirements in Appendix B of DoD QSM 5.0	Repeat calibration	Accutest Florida Analyst	SOP MS006, MS008
GC/MS	ICV	Once after each initial calibration	The percent recovery (%R) must be within 80-120% for all target compounds	Correct problem and verify second source standard. Rerun second source verification. If that fails, correct problem and repeat ICAL.	Accutest Florida Analyst	SOP MS006, MS008
GC/MS	CCV	Daily, before sample analysis, and every 12 hours of analysis time, at the end of analytical lbatch	The percent recovery (%R) must be within 80-120% for all target compounds	If the %D $\geq$ 20% and sample results are <Project LOQ, report with qualification. Otherwise, reanalyze all samples analyzed since the last successful CCV. Follow procedures in DoD QSM 5.0. Repeat ICAL if necessary	Accutest Florida Analyst	SOP MS006, MS008

**SAP Worksheet #24 – Analytical Instrument Calibration Table (Continued)**

<b>Instrument</b>	<b>Calibration Procedure</b>	<b>Frequency of Calibration</b>	<b>Acceptance Criteria</b>	<b>Corrective Action (CA)</b>	<b>Person Responsible for CA</b>	<b>SOP Reference</b>
GC/ECD	ICAL, minimum 5 points. Accutest routinely analyzes 6 points.	Instrument receipt, major instrument change, when CV does not meet criteria	Follow requirements in Appendix B of DoD QSM 5.0	Repeat ICAL and/or perform necessary equipment maintenance. Check calibration standards. Reanalyze affected data	Accutest Florida Analyst	SOP GC014, GC015
GC/ECD	ICV	Immediately following ICAL	All project analytes within $\pm 20\%$ of expected value from the ICAL	Correct problem, rerun ICV. If that fails, repeat ICAL.	Accutest Florida Analyst	SOP GC014, GC015
GC/ECD	CCV	After every 10 samples; If calibration curve previously analyzed, analyze daily before samples.	$\%D \leq 20$ for both the quantitation and confirmation columns	If the $\%D \geq 20\%$ and sample results are $<$ Project LOQ, report with qualification. Otherwise, reanalyze all samples analyzed since the last successful CCV. Follow procedures in DoD QSM 5.0. Repeat ICAL if necessary	Accutest Florida Analyst	SOP GC014, GC015

**SAP Worksheet #24 – Analytical Instrument Calibration Table (Continued)**

<b>Instrument</b>	<b>Calibration Procedure</b>	<b>Frequency of Calibration</b>	<b>Acceptance Criteria</b>	<b>Corrective Action (CA)</b>	<b>Person Responsible for CA</b>	<b>SOP Reference</b>
GC/ECD for herbicides	ICAL, minimum 5 points. Accutest routinely analyzes 6 points.	Instrument receipt, major instrument change, when CV does not meet criteria	Follow requirements in Appendix B of DoD QSM 5.0	Repeat ICAL and/or perform necessary equipment maintenance. Check calibration standards. Reanalyze affected data	Accutest Florida Analyst	SOP GC031
GC/ECD for herbicides	ICV	Immediately following ICAL	All project analytes within $\pm 20\%$ of expected value from the ICAL	Correct problem, rerun ICV. If that fails, repeat ICAL.	Accutest Florida Analyst	SOP GC031
GC/ECD for herbicides	CCV	After every 10 samples; If calibration curve previously analyzed, analyze daily before samples.	$\%D \leq 20$ for both the quantitation and confirmation columns	If the $\%D \geq 20\%$ and sample results are $<$ Project LOQ, report with qualification. Otherwise, reanalyze all samples analyzed since the last successful CCV. Follow procedures in DoD QSM 5.0. Repeat ICAL if necessary	Accutest Florida Analyst	SOP GC031

**SAP Worksheet #24 – Analytical Instrument Calibration Table (Continued)**

<b>Instrument</b>	<b>Calibration Procedure</b>	<b>Frequency of Calibration</b>	<b>Acceptance Criteria</b>	<b>Corrective Action (CA)</b>	<b>Person Responsible for CA</b>	<b>SOP Reference</b>
HPLC	ICAL, minimum 5 points. Accutest routinely analyzes 6 points.	Instrument receipt, major instrument change, when CV does not meet criteria	One of the options below: Option 1: RSD for each analyte $\leq 15\%$ ; Option 2: linear least squares regression: $r \geq 0.995$ or $r^2 \geq 0.99$ ; Option 3: non-linear regression: $r^2 \geq 0.99$ (6 points shall be used for second order)	Repeat ICAL and/or perform necessary equipment maintenance. Check calibration standards. Reanalyze affected data	Accutest Florida Analyst	SOP GC034
HPLC	ICV	Immediately following ICAL	All project analytes within $\pm 20\%$ of expected value from the ICAL	Correct problem, rerun ICV. If that fails, repeat ICAL.	Accutest Florida Analyst	SOP GC034
HPLC	CCV	After every 10 samples; If calibration curve previously analyzed, analyze daily before samples.	$\%D \leq 20$ for both the quantitation and confirmation columns	If the $\%D \geq 20\%$ and sample results are $<$ Project LOQ, report with qualification. Otherwise, reanalyze all samples analyzed since the last successful CCV. Follow procedures in DoD QSM 5.0. Repeat ICAL if necessary. Applies to both primary and confirmation columns.	Accutest Florida Analyst	SOP GC034

**SAP Worksheet #24 – Analytical Instrument Calibration Table (Continued)**

<b>Instrument</b>	<b>Calibration Procedure</b>	<b>Frequency of Calibration</b>	<b>Acceptance Criteria</b>	<b>Corrective Action (CA)</b>	<b>Person Responsible for CA</b>	<b>SOP Reference</b>
GC/FID	ICAL, minimum 5 points. Accutest routinely analyzes 6 points.	Instrument receipt, major instrument change, when CV does not meet criteria	One of the options below: Option 1: RSD for each analyte $\leq 20\%$ ; Option 2: linear least squares regression: $r \geq 0.995$ or $r^2 \geq 0.99$ ; Option 3: non-linear regression: $r^2 \geq 0.99$ (6 points shall be used for second order)	Repeat ICAL and/or perform necessary equipment maintenance. Check calibration standards. Reanalyze affected data	Accutest Florida Analyst	SOP GC010, GC011
GC/FID	ICV	Immediately following ICAL	All project analytes within $\pm 20\%$ of expected value from the ICAL	Correct problem, rerun ICV. If that fails, repeat ICAL.	Accutest Florida Analyst	SOP GC010, GC011
GC/FID	CCV	After every 10 samples; If calibration curve previously analyzed, analyze daily before samples.	$\%D \leq 20$ for both the quantitation and confirmation columns	Evaluate the samples: If the $\%D \geq 15\%$ and sample results are $<$ Project LOQ, narrate. If $\%D \pm 15\%$ only on one channel, narrate. If $\%D \pm 15\%$ for closing CCV, and is likely a result of matrix interference, narrate. Otherwise, reanalyze all samples back to last acceptable CCV.	Accutest Florida Analyst	SOP GC010, GC011

**SAP Worksheet #24 – Analytical Instrument Calibration Table (Continued)**

<b>Instrument</b>	<b>Calibration Procedure</b>	<b>Frequency of Calibration</b>	<b>Acceptance Criteria</b>	<b>Corrective Action (CA)</b>	<b>Person Responsible for CA</b>	<b>SOP Reference</b>
ICP-AES	ICAL	Daily	If more than one calibration standard is used, correlation coefficient ( $r \geq 0.995$ ( $r^2 > 0.990$ ))	Recalibrate and/or perform necessary equipment maintenance. Check calibration standards.	Accutest Florida Analyst	SOP MET100
ICP-AES	ICV	Once after each ICAL, before beginning a sample run.	The %R must be within 90-110% of true value for all analytes.	Do not use results for failing elements unless the ICV > 110% and the sample results are not detect. Investigate and correct the problem.	Accutest Florida Analyst	SOP MET100
ICP-AES	CCV	At the beginning and end of each run sequence and every 10 samples	90-110% of True Values	Check problem, recalibrate and reanalyze any samples not bracketed by passing CCVs.	Accutest Florida Analyst	SOP MET100

**SAP Worksheet #24 – Analytical Instrument Calibration Table (Continued)**

<b>Instrument</b>	<b>Calibration Procedure</b>	<b>Frequency of Calibration</b>	<b>Acceptance Criteria</b>	<b>Corrective Action (CA)</b>	<b>Person Responsible for CA</b>	<b>SOP Reference</b>
Cold vapor analyzer	ICAL	Instrument receipt, major instrument change, at the start of each day	Min 5 pt initial Calibration and a calibration blank Linear regression R-Squared >0.990 (R>0.995)	Recalibrate and/or perform necessary equipment maintenance. Check calibration standards.	Accutest Florida Analyst	SOP MET105
Cold vapor analyzer	ICV	Once after each ICAL, before beginning a sample run.	The %R must be within 90-110% of true value for mercury.	Correct problem and verify second source standard. Rerun ICV. If that fails, correct problem and repeat ICAL.	Accutest Florida Analyst	SOP MET105
Cold vapor analyzer	CCV	At beginning and end of each run sequence and every 10 samples	90-110% of True Value	Check problem, recalibrate and reanalyze any samples not bracketed by passing CCVs.	Accutest Florida Analyst	SOP MET105

**SAP Worksheet #24 – Analytical Instrument Calibration Table (Continued)**

<b>Instrument</b>	<b>Calibration Procedure</b>	<b>Frequency of Calibration</b>	<b>Acceptance Criteria</b>	<b>Corrective Action (CA)</b>	<b>Person Responsible for CA</b>	<b>SOP Reference</b>
Spectrophotometer	ICAL	_Every 30 days or as required when ICV/CCV exceeds limits, whichever comes first. _Minimum 5 standards and a calibration blank _Low standard at the RL/LOQ level	Linear fit with a correlation coefficient (r) of $\geq 0.995$ ( $r^2 \geq 0.990$ )	Recalibrate and/or perform necessary equipment maintenance. Check calibration standards.	Accutest Florida Analyst	SOP GN171
Spectrophotometer	ICV	Alternate source standard to be analyzed after every calibration curve and at the beginning of every analytical sequence	Value of second source for all analytes(s) within $\pm 10\%$ of true value.	Correct problem and verify second source standard. Rerun ICV. If that fails, correct problem and repeat ICAL.	Accutest Florida Analyst	SOP GN171
Spectrophotometer	CCV	After every 10-client samples and at the end of the analytical sequence	Within $\pm 10\%$ of true value.	Check problem, recalibrate and reanalyze any samples not bracketed by passing CCVs.	Accutest Florida Analyst	SOP GN171

**SAP Worksheet #24 – Analytical Instrument Calibration Table (Continued)**

<b>Instrument</b>	<b>Calibration Procedure</b>	<b>Frequency of Calibration</b>	<b>Acceptance Criteria</b>	<b>Corrective Action (CA)</b>	<b>Person Responsible for CA</b>	<b>SOP Reference</b>
Lachat QuikChem	ICAL	5 point and a blank calibration; Correlation coefficient $\geq 0.995$ or R-Squared $\geq 0.990$ .	5 point and a blank calibration; Correlation coefficient $\geq 0.995$ .	Recalibrate and/or perform necessary equipment maintenance. Check calibration standards.	Accutest Florida Analyst	SOP GN115
Lachat QuikChem	ICV	Once after each ICAL, before beginning a sample run.	The %R must be within 90-110% of true value for mercury.	Correct problem and verify second source standard. Rerun ICV. If that fails, correct problem and repeat ICAL.	Accutest Florida Analyst	SOP GN115
Lachat QuikChem	CCV	At beginning and end of each run sequence and every 10 samples	90-110% of True Value	Check problem, recalibrate and reanalyze any samples not bracketed by passing CCVs.	Accutest Florida Analyst	SOP GN115

**SAP Worksheet #25 – Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table**

<b>Instrument Equipment</b>	<b>Maintenance Activity</b>	<b>Testing Activity</b>	<b>Inspection Activity</b>	<b>Frequency</b>	<b>Acceptance Criteria</b>	<b>Corrective Action</b>	<b>Responsible Person</b>	<b>SOP Reference</b>
GC/MS for VOCs	Check pressure and gas supply daily. Bake out trap and column, manual tune if BFB not in criteria, change septa as needed, cut column as needed, change trap as needed. Other maintenance specified in lab Equipment Maintenance SOP.	QC standards	Ion source, injector liner, column, column flow, purge lines, purge flow, trap	Before ICAL and/or as necessary.	Acceptable Tune	Correct the problem and repeat tune check	Accutest Florida Analyst	SOP MS005
GC/MS for SVOCs or SVOCs SIM	Check pressure and gas supply daily. Manual tune if DFTPP not in criteria, change septa as needed, change liner as needed, cut column as needed. Other maintenance specified in lab Equipment Maintenance SOP.	QC standards	Ion source, injector liner, column, column flow	Before ICAL and/or as necessary	Acceptable Tune	Correct the problem and repeat tune check	Accutest Florida Analyst	SOP MS006, MS008
GC/ECD	Check pressure and gas supply daily. Change septa and/or liner as needed, replace or cut column as needed. Other maintenance specified in lab Equipment Maintenance SOP.	QC standards	Injector liner, septa, column, column flow.	Before ICAL and/or as necessary.	Acceptable calibration or CCV	Correct the problem and repeat calibration or CCV	Accutest Florida Analyst	SOP GC014, GC015

**SAP Worksheet #25 – Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table (Continued)**

<b>Instrument Equipment</b>	<b>Maintenance Activity</b>	<b>Testing Activity</b>	<b>Inspection Activity</b>	<b>Frequency</b>	<b>Acceptance Criteria</b>	<b>Corrective Action</b>	<b>Responsible Person</b>	<b>SOP Reference</b>
GC/ECD for herbicides	Check pressure and gas supply daily. Change septa and/or liner as needed, replace or cut column as needed. Other maintenance specified in lab Equipment Maintenance SOP.	QC standards	Injector liner, septa, column, column flow.	Before ICAL and/or as necessary.	Acceptable calibration or CCV	Correct the problem and repeat calibration or CCV	Accutest Florida Analyst	SOP GC031
HPLC	Check pressure and gas supply daily – change when <200psi, change analytical column as needed, change mobile phase when insufficient for run or contamination, change inlet filters as needed for contamination.	Dinitrotoluenes and Nitroglycerin	Check pump pressure, check for leaks, check for adequate mobile phase.	Prior to initial calibration or as necessary.	CCV $\leq$ 20% difference.	Recalibrate and/or perform necessary equipment maintenance. Check calibration standards. Reanalyze affected data.	Accutest Florida Analyst	SOP GC034
GC/FID	Check pressure and gas supply daily. Bake out column, change septa, liner, seal as needed, cut column as needed.	Liner, seal, septum, column	Prior to initial calibration or as necessary	Percent difference $\leq$ 20%	Recalibrate and/or perform the necessary equipment maintenance. Check the calibration standards. Reanalyze the affected data	Check pressure and gas supply daily. Bake out column, change septa, liner, seal as needed, cut column as needed.	Accutest Florida Analyst	SOP GC010, GC011

**SAP Worksheet #25 – Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table (Continued)**

<b>Instrument Equipment</b>	<b>Maintenance Activity</b>	<b>Testing Activity</b>	<b>Inspection Activity</b>	<b>Frequency</b>	<b>Acceptance Criteria</b>	<b>Corrective Action</b>	<b>Responsible Person</b>	<b>SOP Reference</b>
ICP-AES	Clean torch assembly and spray chamber when discolored or when degradation in data quality is observed. Clean nebulizer, check argon, replace peristaltic pump tubing as needed. Other maintenance specified in lab Equipment Maintenance SOP.	QC standards	Torch, nebulizer chamber, pump, pump tubing	Before ICAL and as necessary	Acceptable calibration or CCV	Correct the problem and repeat calibration or CCV	Accutest Florida Analyst	SOP MET100
Cold vapor analyzer	Replace peristaltic pump tubing, replace mercury lamp, replace drying tube, clean optical cell and/or clean liquid/gas separator as needed. Other maintenance specified in lab Equipment Maintenance SOP.	QC standards	Tubing, sample probe, optical cell	Before ICAL and as necessary	Acceptable calibration or CCV	Correct the problem and repeat calibration or CCV	Accutest Florida Analyst	SOPMET105
Hexavelant chromium	Checking cuvette for cracks and deposits	Equipment	Lamp replacement, Cuvette cleaning	Frequency determined by passing calibration	CCV < 10% difference.	Repeat maintenance activity of remove from service	Accutest Florida Analyst	SOP GN171
Lachat	Flush/replace tubing	Equipment	Tubing, peristaltic pump, lamp, detector optical cell	As needed	CCV < 10% difference.	Repeat maintenance activity of remove from service	Accutest Florida Analyst	SOP GN115

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## SAP Worksheet #26 – Sample Handling System

### Sample Handling System

<b>SAMPLE COLLECTION, PACKAGING, AND SHIPMENT</b>
Sample Collection (Personnel/Organization): Sampler/TtEC
Sample Packaging (Personnel/Organization): Sampler/TtEC
Coordination of Shipment (Personnel/Organization): Sampler/TtEC
Type of Shipment/Carrier: Commercial carrier
<b>SAMPLE RECEIPT AND ANALYSIS</b>
Sample Receipt (Personnel/Organization): Sample Custodian/Accutest Florida
Sample Custody and Storage (Personnel/Organization): Sample Custodian/ Accutest Florida
Sample Preparation (Personnel/Organization): Sample preparation personnel/ Accutest Florida
Sample Determinative Analysis (Personnel/Organization): Analyst/ Accutest Florida
<b>SAMPLE ARCHIVING</b>
Field Sample Storage (No. of days from sample collection): 45 calendar days
Sample Extract/Digestate Storage (No. of days from extraction/digestion): 30 calendar days
Biological Sample Storage (No. of days from sample collection): Not applicable to this project
<b>SAMPLE DISPOSAL/ARCHIVE</b>
Personnel/Organization: Sample Custodian/ Accutest Florida
Number of Days from Analysis: 90 calendar days from sample receipt

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## **SAP Worksheet #27 – Sample Custody Requirements Table**

An overriding consideration for data resulting from laboratory analyses is the ability to demonstrate that the data are legally defensible, i.e., that the samples were obtained from the locations stated and that they reached the laboratory without alteration. To accomplish this, evidence of collection, shipment, laboratory receipt, and laboratory custody until disposal will be documented through the COC record. A sample is considered to be in custody if the following conditions have been observed:

- In actual possession or in view of the person who collected the samples
- Locked in a secure area
- Placed in an area restricted to authorized personnel

The COC record lists each sample and the individuals performing the sample collection, shipment, and receipt. The COC record will be the controlling document to ensure that the sample custody is maintained. Each time the sample custody is transferred, the former custodian will sign the COC on the \_Relinquished By\_ line, and the new custodian will sign the COC on the \_Received By\_ line. The date, time, and project or company affiliation will accompany each signature. When a commercial carrier is used to ship samples to the laboratory, the waybill number and carrier name (i.e., FedEx) will be recorded on the COC. The shipping container will be secured with two custody seals, thereby allowing for custody to be maintained by the shipping personnel until receipt by the laboratory.

Sample custody will be the responsibility of sampling personnel from the time of sample collection until the samples are accepted by the laboratory. Thereafter, the laboratory performing the analysis will maintain custody. The sample custodian will sign the COC, inventory each shipment, and note any discrepancies on the sample login form. The laboratory will immediately notify the TtEC Project Chemist of any discrepancies. The laboratory will have a system for tracking samples consistent with the Quality Systems Manual (QSM) (DoD 2013).

In addition to providing a custody exchange record for the samples, the COC record serves as a formal request for sample analyses. The COC records will be completed, signed, and distributed as follows:

- The original copy sent to the laboratory along with the samples
- A copy retained on-site for inclusion in the project files
- A copy e-mailed to the Project Chemist on a daily basis to allow tracking of samples sent to laboratories to confirm laboratory receipt of samples

### **SAMPLE NUMBERING**

The sample number will be recorded in the field logbook, on the labels, and on the COC record at the time of sample collection. A complete description of the sample and sampling conditions will be recorded in the field logbook and referenced using the unique sample identification number. Samples will be uniquely designated using a numbering system as indicated in SAP Worksheet #18.

## **SAP Worksheet #27 – Sample Custody Requirements Table (Continued)**

### **SAMPLE PACKAGING**

All glass containers will be wrapped with bubble wrap (if transported by Fedex). Samples will be shipped in coolers. Each cooler will be shipped with a temperature blank. A temperature blank is a container filled with tap water and stored in the cooler during sample collection and transportation. The sample cooler will be lined with a plastic bag. Double-bagged ice will be added inside the plastic bag at the bottom of the cooler, one layer of sample containers will be placed on the ice, and more double-bagged ice will be placed on top of the containers. This will be repeated until the cooler is filled with ice as the top layer in the cooler. Sample cooler drain spouts will be taped from the inside and outside of the cooler to prevent any leakage.

For FedEx delivery, the COC record will include the air bill number, and the “Received By” box will be labeled with “Fedex”. The COC record will be sealed in a double-resealable bag and then taped to the inside of the sample cooler lid. The cooler will be taped shut with strapping tape. Two custody seals will be taped across the cooler lid: one seal in the front and one seal in the back. Clear tape will be applied to the custody seals to prevent accidental breakage during shipment. The pouch for the air bill will be placed on the cooler and secured with clear tape. The air bill will be completed for priority overnight delivery and placed in the pouch. If multiple coolers are being shipped, the original air bill will be placed on the cooler with the COC record, and copies of the air bill will be placed on the other coolers. The number of packages should be included on each air bill (1 of 2, 2 of 2). Saturday deliveries, if required, should be coordinated with the laboratory in advance via the Project Chemist, and field sampling personnel or their designee must ensure that Saturday delivery stickers are placed on each cooler by Fedex.

## SAP Worksheet #28 – Laboratory QC Samples Table

**Matrix:** Soil

**Analytical Group:** VOCs

**Analytical Method/SOP Reference:** EPA 8260B / SOP MS005

QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
Method Blank	1 per preparatory batch (defined as ≤ 20 samples)	No analytes detected > ½ LOQ or >1/10 sample concentration or >1/10 regulatory limit.	Correct the problem. Report sample results that are <LOD or >10x the blank concentration. Reprepare and reanalyze the method blank and all associated samples with results > LOD and < 10x the contaminated blank result. Contact Client if samples cannot be repped within hold time.	Accutest Florida Analyst	Accuracy	No analytes detected > ½ LOQ or >1/10 sample concentration or >1/10 regulatory limit.
LCS	1 per preparatory batch (defined as ≤ 20 samples)	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available. Refer to the DoD QSM 5.0 for number of marginal exceedences allowed. Contact Client if samples cannot be repped within hold time.	Accutest Florida Analyst	Accuracy	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.

**SAP Worksheet #28 – Laboratory QC Samples Table (Continued)**

<b>QC Sample</b>	<b>Frequency/ Number</b>	<b>Method/SOP QC Acceptance Limits</b>	<b>Corrective Action</b>	<b>Person(s) Responsible for Corrective Action</b>	<b>Data Quality Indicator</b>	<b>Measurement Performance Criteria</b>
MS/MSD	1 per preparatory batch (defined as ≤ 20 samples)	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Accutest Florida Analyst	Accuracy/ Precision	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.
Surrogate	All samples, Standards and QC	Surrogate spike results shall be compared with DoD QSM 5.0 Appendix C LCS limits. If these criteria are not available, the laboratory shall compare the results with its in-house statistically established LCS criteria.	For QC and field samples, correct problem then reprep and reanalyze all failed samples for failed surrogates in the associated preparatory batch, if sufficient sample material is available. If obvious chromatographic interference with surrogate is present, reanalysis may not be necessary. Contact Client if samples cannot be reprep within hold time.	Accutest Florida Analyst	Accuracy	Surrogate spike results shall be compared with DoD QSM 5.0 Appendix C LCS limits. If these criteria are not available, the laboratory shall compare the results with its in-house statistically established LCS criteria.

**SAP Worksheet #28 – Laboratory QC Samples Table (Continued)**

**Matrix:** Soil

**Analytical Group:** SVOCs and SVOCs by SIM

**Analytical Method/SOP Reference :** EPA 8270D and 8270D SIM/ SOPs MS006 and MS008

QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
Method Blank	1 per preparatory batch (defined as ≤ 20 samples)	No analytes detected > ½ LOQ or >1/10 sample concentration or >1/10 regulatory limit.	Correct the problem. Report sample results that are <LOD or >10x the blank concentration. Reprepare and reanalyze the method blank and all associated samples with results > LOD and < 10x the contaminated blank result. Contact Client if samples cannot be repped within hold time.	Accutest Florida Analyst	Accuracy	No analytes detected > ½ LOQ or >1/10 sample concentration or >1/10 regulatory limit.
LCS	1 per preparatory batch (defined as ≤ 20 samples)	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available. Refer to the DoD QSM 5.0 for number of marginal exceedences allowed. Contact Client if samples cannot be repped within hold time.	Accutest Florida Analyst	Accuracy	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.

**SAP Worksheet #28 – Laboratory QC Samples Table (Continued)**

<b>QC Sample</b>	<b>Frequency/ Number</b>	<b>Method/SOP QC Acceptance Limits</b>	<b>Corrective Action</b>	<b>Person(s) Responsible for Corrective Action</b>	<b>Data Quality Indicator</b>	<b>Measurement Performance Criteria</b>
MS/MSD	1 per preparatory batch (defined as ≤ 20 samples)	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Accutest Florida Analyst	Accuracy/ Precision	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.
Surrogate	All samples, Standards and QC	Surrogate spike results shall be compared with DoD QSM 5.0 Appendix C LCS limits. If these criteria are not available, the laboratory shall compare the results with its in-house statistically established LCS criteria.	For QC and field samples, correct problem then reprep and reanalyze all failed samples for failed surrogates in the associated preparatory batch, if sufficient sample material is available. If obvious chromatographic interference with surrogate is present, reanalysis may not be necessary. Contact Client if samples cannot be reprep'd within hold time.	Accutest Florida Analyst	Accuracy	Surrogate spike results shall be compared with DoD QSM 5.0 Appendix C LCS limits. If these criteria are not available, the laboratory shall compare the results with its in-house statistically established LCS criteria.

### SAP Worksheet #28 – Laboratory QC Samples Table (Continued)

**Matrix:** Soil

**Analytical Group:** Pesticides

**Analytical Method/SOP Reference :** EPA 8081B / SOP GC015

QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
Method Blank	1 per preparatory batch (defined as ≤ 20 samples)	No analytes detected > ½ LOQ or >1/10 sample concentration or >1/10 regulatory limit.	Correct the problem. Report sample results that are <LOD or >10x the blank concentration. Reprepare and reanalyze the method blank and all associated samples with results > LOD and < 10x the contaminated blank result. Contact Client if samples cannot be repped within hold time.	Accutest Florida Analyst	Accuracy	No analytes detected > ½ LOQ or >1/10 sample concentration or >1/10 regulatory limit.
LCS	1 per preparatory batch (defined as ≤ 20 samples)	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available. Refer to the DoD QSM 5.0 for number of marginal exceedences allowed. Contact Client if samples cannot be repped within hold time.	Accutest Florida Analyst	Accuracy	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.

**SAP Worksheet #28 – Laboratory QC Samples Table (Continued)**

<b>QC Sample</b>	<b>Frequency/ Number</b>	<b>Method/SOP QC Acceptance Limits</b>	<b>Corrective Action</b>	<b>Person(s) Responsible for Corrective Action</b>	<b>Data Quality Indicator</b>	<b>Measurement Performance Criteria</b>
MS/MSD	1 per preparatory batch (defined as ≤ 20 samples)	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Accutest Florida Analyst	Accuracy/ Precision	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.
Surrogate	All samples, Standards and QC	Surrogate spike results shall be compared with DoD QSM 5.0 Appendix C LCS limits. If these criteria are not available, the laboratory shall compare the results with its in-house statistically established LCS criteria.	For QC and field samples, correct problem then reprep and reanalyze all failed samples for failed surrogates in the associated preparatory batch, if sufficient sample material is available. If obvious chromatographic interference with surrogate is present, reanalysis may not be necessary. Contact Client if samples cannot be repped within hold time.	Accutest Florida Analyst	Accuracy	Surrogate spike results shall be compared with DoD QSM 5.0 Appendix C LCS limits. If these criteria are not available, the laboratory shall compare the results with its in-house statistically established LCS criteria.

### SAP Worksheet #28 – Laboratory QC Samples Table (Continued)

**Matrix:** Soil

**Analytical Group:** PCBs

**Analytical Method/SOP Reference :** EPA 8082A / SOP GC014

QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
Method Blank	1 per preparatory batch (defined as ≤ 20 samples)	No analytes detected > ½ LOQ or >1/10 sample concentration or >1/10 regulatory limit.	Correct the problem. Report sample results that are <LOD or >10x the blank concentration. Reprepare and reanalyze the method blank and all associated samples with results > LOD and < 10x the contaminated blank result. Contact Client if samples cannot be repped within hold time.	Accutest Florida Analyst	Accuracy	No analytes detected > ½ LOQ or >1/10 sample concentration or >1/10 regulatory limit.
LCS	1 per preparatory batch (defined as ≤ 20 samples)	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available. Refer to the DoD QSM 5.0 for number of marginal exceedences allowed. Contact Client if samples cannot be repped within hold time.	Accutest Florida Analyst	Accuracy	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.

**SAP Worksheet #28 – Laboratory QC Samples Table (Continued)**

<b>QC Sample</b>	<b>Frequency/ Number</b>	<b>Method/SOP QC Acceptance Limits</b>	<b>Corrective Action</b>	<b>Person(s) Responsible for Corrective Action</b>	<b>Data Quality Indicator</b>	<b>Measurement Performance Criteria</b>
MS/MSD	1 per preparatory batch (defined as ≤ 20 samples)	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Accutest Florida Analyst	Accuracy/ Precision	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.
Surrogate	All samples, Standards and QC	Surrogate spike results shall be compared with DoD QSM 5.0 Appendix C LCS limits. If these criteria are not available, the laboratory shall compare the results with its in-house statistically established LCS criteria.	For QC and field samples, correct problem then reprep and reanalyze all failed samples for failed surrogates in the associated preparatory batch, if sufficient sample material is available. If obvious chromatographic interference with surrogate is present, reanalysis may not be necessary. Contact Client if samples cannot be reprep within hold time.	Accutest Florida Analyst	Accuracy	Surrogate spike results shall be compared with DoD QSM 5.0 Appendix C LCS limits. If these criteria are not available, the laboratory shall compare the results with its in-house statistically established LCS criteria.

### SAP Worksheet #28 – Laboratory QC Samples Table (Continued)

**Matrix:** Soil

**Analytical Group:** Herbicides

**Analytical Method/SOP Reference :** EPA 8151A / GC031

QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
Method Blank	1 per preparatory batch (defined as ≤ 20 samples)	No analytes detected > ½ LOQ or >1/10 sample concentration or >1/10 regulatory limit.	Correct the problem. Report sample results that are <LOD or >10x the blank concentration. Reprepare and reanalyze the method blank and all associated samples with results > LOD and < 10x the contaminated blank result. Contact Client if samples cannot be reprepped within hold time.	Accutest Florida Analyst	Accuracy	No analytes detected > ½ LOQ or >1/10 sample concentration or >1/10 regulatory limit.
LCS	1 per preparatory batch (defined as ≤ 20 samples)	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available. Refer to the DoD QSM 5.0 for number of marginal exceedences allowed. Contact Client if samples cannot be reprepped within hold time.	Accutest Florida Analyst	Accuracy	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.

**SAP Worksheet #28 – Laboratory QC Samples Table (Continued)**

<b>QC Sample</b>	<b>Frequency/ Number</b>	<b>Method/SOP QC Acceptance Limits</b>	<b>Corrective Action</b>	<b>Person(s) Responsible for Corrective Action</b>	<b>Data Quality Indicator</b>	<b>Measurement Performance Criteria</b>
MS/MSD	1 per preparatory batch (defined as ≤ 20 samples)	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Accutest Florida Analyst	Accuracy/ Precision	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.
Surrogate	All samples, Standards and QC	Surrogate spike results shall be compared with DoD QSM 5.0 Appendix C LCS limits. If these criteria are not available, the laboratory shall compare the results with its in-house statistically established LCS criteria.	For QC and field samples, correct problem then reprep and reanalyze all failed samples for failed surrogates in the associated preparatory batch, if sufficient sample material is available. If obvious chromatographic interference with surrogate is present, reanalysis may not be necessary. Contact Client if samples cannot be reprep within hold time.	Accutest Florida Analyst	Accuracy	Surrogate spike results shall be compared with DoD QSM 5.0 Appendix C LCS limits. If these criteria are not available, the laboratory shall compare the results with its in-house statistically established LCS criteria.

## SAP Worksheet #28 – Laboratory QC Samples Table (Continued)

**Matrix:** Soil

**Analytical Group:** Explosives

**Analytical Method/SOP Reference :** EPA 8330B / GC034

QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
Method Blank	1 per preparatory batch (defined as ≤ 20 samples)	No analytes detected > ½ LOQ or >1/10 sample concentration or >1/10 regulatory limit.	Correct the problem. Report sample results that are <LOD or >10x the blank concentration. Reprepare and reanalyze the method blank and all associated samples with results > LOD and < 10x the contaminated blank result. Contact Client if samples cannot be reprepped within hold time.	Accutest Florida Analyst	Accuracy	No analytes detected > ½ LOQ or >1/10 sample concentration or >1/10 regulatory limit.
LCS	1 per preparatory batch (defined as ≤ 20 samples)	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available. Refer to the DoD QSM 5.0 for number of marginal exceedences allowed. Contact Client if samples cannot be reprepped within hold time.	Accutest Florida Analyst	Accuracy	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.

**SAP Worksheet #28 – Laboratory QC Samples Table (Continued)**

<b>QC Sample</b>	<b>Frequency/ Number</b>	<b>Method/SOP QC Acceptance Limits</b>	<b>Corrective Action</b>	<b>Person(s) Responsible for Corrective Action</b>	<b>Data Quality Indicator</b>	<b>Measurement Performance Criteria</b>
MS/MSD	1 per preparatory batch (defined as ≤ 20 samples)	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Accutest Florida Analyst	Accuracy/ Precision	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.
Surrogate	All samples, Standards and QC	Surrogate spike results shall be compared with DoD QSM 5.0 Appendix C LCS limits. If these criteria are not available, the laboratory shall compare the results with its in-house statistically established LCS criteria.	For QC and field samples, correct problem then reprep and reanalyze all failed samples for failed surrogates in the associated preparatory batch, if sufficient sample material is available. If obvious chromatographic interference with surrogate is present, reanalysis may not be necessary. Contact Client if samples cannot be reprep'd within hold time.	Accutest Florida Analyst	Accuracy	Surrogate spike results shall be compared with DoD QSM 5.0 Appendix C LCS limits. If these criteria are not available, the laboratory shall compare the results with its in-house statistically established LCS criteria.

### SAP Worksheet #28 – Laboratory QC Samples Table (Continued)

**Matrix:** Soil

**Analytical Group:** TPH-GRO/DRO/ORO

**Analytical Method/SOP Reference :** EPA8015C / SOPGC010, GC011

QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
Method Blank	1 per preparatory batch (defined as ≤ 20 samples)	No analytes detected > ½ LOQ or >1/10 sample concentration or >1/10 regulatory limit.	Correct the problem. Report sample results that are <LOD or >10x the blank concentration. Reprepare and reanalyze the method blank and all associated samples with results > LOD and < 10x the contaminated blank result. Contact Client if samples cannot be reprepped within hold time.	Accutest Florida Analyst	Accuracy	No analytes detected > ½ LOQ or >1/10 sample concentration or >1/10 regulatory limit.
LCS	1 per preparatory batch (defined as ≤ 20 samples)	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available. Refer to the DoD QSM 5.0 for number of marginal exceedences allowed. Contact Client if samples cannot be reprepped within hold time.	Accutest Florida Analyst	Accuracy	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.

**SAP Worksheet #28 – Laboratory QC Samples Table (Continued)**

<b>QC Sample</b>	<b>Frequency/ Number</b>	<b>Method/SOP QC Acceptance Limits</b>	<b>Corrective Action</b>	<b>Person(s) Responsible for Corrective Action</b>	<b>Data Quality Indicator</b>	<b>Measurement Performance Criteria</b>
MS/MSD	1 per preparatory batch (defined as ≤ 20 samples)	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Accutest Florida Analyst	Accuracy/ Precision	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.
Surrogate	All samples, Standards and QC	Surrogate spike results shall be compared with DoD QSM 5.0 Appendix C LCS limits. If these criteria are not available, the laboratory shall compare the results with its in-house statistically established LCS criteria.	For QC and field samples, correct problem then reprep and reanalyze all failed samples for failed surrogates in the associated preparatory batch, if sufficient sample material is available. If obvious chromatographic interference with surrogate is present, reanalysis may not be necessary. Contact Client if samples cannot be reprep within hold time.	Accutest Florida Analyst	Accuracy	Surrogate spike results shall be compared with DoD QSM 5.0 Appendix C LCS limits. If these criteria are not available, the laboratory shall compare the results with its in-house statistically established LCS criteria.

**SAP Worksheet #28 – Laboratory QC Samples Table (Continued)**

**Matrix:** Soil

**Analytical Group:** Metals

**Analytical Method/SOP Reference :** EPA 6010C and 7471B / SOP MET100 and MET105

QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
Method Blank	1 per preparatory batch (defined as ≤ 20 samples)	No analytes detected > ½ LOQ or >1/10 sample concentration or >1/10 regulatory limit.	Correct the problem. Report sample results that are <LOD or >10x the blank concentration. Reprepare and reanalyze the method blank and all associated samples with results > LOD and < 10x the contaminated blank result.	Accutest Florida Analyst	Accuracy	No analytes detected > ½ LOQ or >1/10 sample concentration or >1/10 regulatory limit.
Calibration Blank	Before beginning a sample run, after every 10 samples, and at end of the analysis sequence	No analytes detected > 2 × DL	Correct problem. Re-prepare and reanalyze calibration blank. All samples following the last acceptable calibration blank must be reanalyzed.	Accutest Florida Analyst	Accuracy	No analytes detected > 2 × DL

**SAP Worksheet #28 – Laboratory QC Samples Table (Continued)**

<b>QC Sample</b>	<b>Frequency/ Number</b>	<b>Method/SOP QC Acceptance Limits</b>	<b>Corrective Action</b>	<b>Person(s) Responsible for Corrective Action</b>	<b>Data Quality Indicator</b>	<b>Measurement Performance Criteria</b>
LCS	1 per preparatory batch (defined as ≤ 20 samples)	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available. Refer to the DoD QSM 5.0 for number of marginal exceedences allowed. Contact Client if samples cannot be repped within hold time.	Accutest Florida Analyst	Accuracy	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.
MS and/or MSD	1 per preparatory batch (defined as ≤ 20 samples)	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.	Examine the project-specific DQOs. If the matrix spike falls outside of DoD criteria, additional quality control tests are required to evaluate matrix effects.	Accutest Florida Analyst	Accuracy/ Precision	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.
Serial dilution	Each new sample matrix	1:5 dilution must agree within ±10% of original determination	Perform post-digestion spike (PDS) addition.	Accutest Florida Analyst	Accuracy	1:5 dilution must agree within ±10% of original determination
Post-digestion spike	When serial dilution or matrix spike fails	80-120% for all metals	Narrate	Accutest Florida Analyst	Accuracy	80-120% for all metals

## SAP Worksheet #28 – Laboratory QC Samples Table (Continued)

**Matrix:** Soil

**Analytical Group:** Hexavalent chromium

**Analytical Method/SOP Reference :** EPA 7196A / SOP GN171

QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
Method Blank	1 per preparatory batch (defined as ≤ 20 samples)	No analytes detected > ½ LOQ or >1/10 sample concentration or >1/10 regulatory limit.	Correct the problem. Report sample results that are <LOD or >10x the blank concentration. Reprepare and reanalyze the method blank and all associated samples with results > LOD and < 10x the contaminated blank result.	Accutest Florida Analyst	Accuracy	No analytes detected > ½ LOQ or >1/10 sample concentration or >1/10 regulatory limit.
LCS	1 per preparatory batch (defined as ≤ 20 samples)	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available. Refer to the DoD QSM 5.0 for number of marginal exceedences allowed. Contact Client if samples cannot be repped within hold time.	Accutest Florida Analyst	Accuracy	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.

**SAP Worksheet #28 – Laboratory QC Samples Table (Continued)**

<b>QC Sample</b>	<b>Frequency/ Number</b>	<b>Method/SOP QC Acceptance Limits</b>	<b>Corrective Action</b>	<b>Person(s) Responsible for Corrective Action</b>	<b>Data Quality Indicator</b>	<b>Measurement Performance Criteria</b>
MS and/or MSD	1 per preparatory batch (defined as ≤ 20 samples)	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.	Examine the project-specific DQOs. If the matrix spike falls outside of DoD criteria, additional quality control tests are required to evaluate matrix effects.	Accutest Florida Analyst	Accuracy/ Precision	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.

## SAP Worksheet #28 – Laboratory QC Samples Table (Continued)

**Matrix:** Soil

**Analytical Group:** Cyanide

**Analytical Method/SOP Reference :** EPA 9012B / SOP GN115

QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
Method Blank	1 per preparatory batch (defined as ≤ 20 samples)	No analytes detected > ½ LOQ or >1/10 sample concentration or >1/10 regulatory limit.	Correct the problem. Report sample results that are <LOD or >10x the blank concentration. Reprepare and reanalyze the method blank and all associated samples with results > LOD and < 10x the contaminated blank result.	Accutest Florida Analyst	Accuracy	No analytes detected > ½ LOQ or >1/10 sample concentration or >1/10 regulatory limit.
LCS	1 per preparatory batch (defined as ≤ 20 samples)	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available.	Accutest Florida Analyst	Accuracy	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.
MS and/or MSD	1 per preparatory batch (defined as ≤ 20 samples)	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.	Examine the project-specific DQOs. If the matrix spike falls outside of DoD criteria, additional quality control tests are required to evaluate matrix effects.	Accutest Florida Analyst	Accuracy/ Precision	Within limits listed in Appendix C of the DoD QSM 5.0. For analytes not listed in that table, the laboratory will use in-house statistical values.

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## SAP Worksheet #29 – Project Documents and Records Table

Document	Where Maintained
SAP	TtEC project file; Navy Administrative Record
Field logbook	TtEC project file
Field forms	TtEC project file
COC	TtEC project file; Accutest Florida
Shipping records	TtEC project file
Field surveillance reports	TtEC project file
Field Change Requests	TtEC project file
Laboratory results report	TtEC project file; Accutest Florida
Laboratory data package	TtEC project file and Accutest Florida; a copy will subsequently be sent to Navy Administrative Record

Field documentation associated with sampling activities includes field logbooks, sample labels, COCs, sample shipping records, field surveillance reports, and Field Change Request (FCR) forms. In addition, laboratory documentation will be generated during this project. These types are described in the following sections.

### FIELD LOGBOOK

A permanently bound field logbook with consecutively numbered pages, used for sampling activities only, will be assigned to this project. The logbooks will be numbered sequentially on the cover by the PQCM and that number will be entered into a log-sheet maintained by the PQCM. All entries will be recorded in indelible black or blue ink. At the end of each work day, the logbook pages will be signed by the responsible sampler, and any unused portions of the logbook pages will be crossed out, signed, and dated. If it is necessary to transfer the logbook to another person, the person relinquishing the logbook will sign and date the last page used, and the person receiving the logbook will sign and date the next page to be used. At a minimum, the logbook will contain the following information:

- Project name and site location
- Date and time
- Personnel in attendance
- General weather information
- Work performed
- Field observations

## **SAP Worksheet #29 – Project Documents and Records Table (Continued)**

- Sampling performed, including specifics such as location, type of sample, type of analyses, and sample identification; sample description information such as the soil description and any metal or other waste observed in the excavation
- Field analyses performed, including results, instrument checks, problems, and calibration records for field instruments
- Descriptions of deviations from this SAP
- Problems encountered and corrective action taken
- Identification of field QC samples
- QC activities
- Verbal or written instructions
- Any other events that may affect the samples

### **SAMPLE LABELS**

For sample containers collected for Accutest Florida, labels will be hand-written using indelible black or blue ink and affixed to each sample container at the time of sample collection (or labels may be computer generated). The label will contain the following information:

- Sample identification number
- Sample collection date (month/day/year)
- Time of collection (24-hour clock) from the start of sampling
- Sampler's initials
- Preservative (if any)

### **CHAIN-OF-CUSTODY**

COC information is described in SAP Worksheet #27.

### **SAMPLE SHIPPING RECORDS**

For samples shipped via Fedex, the COC will be packaged within the cooler, and the sender's copy of the air bill will serve as custody documentation and will be maintained on-site in the project file. Sample shipping procedures are detailed in SAP Worksheet #27.

### **FIELD SURVEILLANCE REPORTS**

Field surveillances will be performed in accordance with the three phases of inspection as required by the QC Program. A Preparatory Inspection will be performed by the PQCM prior to the first sampling activities. This will include a general orientation for health and safety. An Initial Inspection will be conducted at the beginning of field sampling activities for this project. Daily field inspections and subsequent surveillances will be performed at the discretion of the PQCM or

## **SAP Worksheet #29 – Project Documents and Records Table (Continued)**

the QCPM throughout the duration of the project. The PQCM will use the Initial Inspection Checklist during inspection.

### **FIELD CHANGE REQUEST**

An FCR will be prepared by the Program Chemist, or a designee, if a change to the SAP occurs during sampling or analysis activities. These changes will be minor and not result in a change in scope and/or DQOs for this project. The FCR must be approved prior to field implementation. Major changes to the work scope affecting the original DQOs may require preparation of a SAP Addendum.

### **LABORATORY DOCUMENTATION**

Samples will be assigned into a sample delivery group (SDG) number for every batch of 20 samples or less based on as received on a daily basis by the laboratory. Initial analytical results that are e-mailed to the TtEC Project Chemist for review will be submitted by the laboratories as follows:

#### Accutest Florida results report:

- Case narrative
- Laboratory signed review page
- Copy of COC
- Sample receipt and login
- Sample results
- Batch QC results

The laboratory will then produce a final data package in hardcopy format and in portable document format (PDF) format, both of which will be sent to the TtEC Project Chemist. The packages will resemble an EPA Level IV-equivalent data package, will be page numbered, and contain the following information:

- Cover page (with laboratory name, address, phone number, contact person, and SDG number, as well as the project name and project number)
- Table of contents
- Case narrative including resolution of all corrective actions and nonconformance
- Sample management records, including a copy of the COC record, shipping documents as applicable, and laboratory sample receipt forms
- Cross-reference table for sample IDs versus laboratory IDs
- Analytical results and quality assurance/QC information as follows:
  - Sample results forms, including method blanks
  - Sample raw data

## **SAP Worksheet #29 – Project Documents and Records Table (Continued)**

- QC summaries
- ICAL
- Calibration checks, including all related CCVs
- Instrument run log
- Sample preparation log

All relevant laboratory raw data and documentation including, but not limited to, logbook, data sheets, electronic files, and reports, will be maintained by the laboratory for at least 5 years.

An electronic data deliverable (EDD) will be submitted to the TtEC Project Chemist. Both the EDDs and the data package will present results up to three significant figures. Results for QC analyses (method blanks, LCS, and duplicates) will be reported up to three significant figures.

When revisions to data packages are required, the revised pages will be stamped with the notation “amended or revised report” and have the same page numbering system as the original pages. If the revisions affect the EDDs, the revised EDD will then be sent along with the revised hardcopy pages to the TtEC Project Chemist.

### SAP Worksheet #30 – Analytical Services Table

Matrix	Analytical Group	Sampling Locations/ ID Number	Analytical Method	Data Package Turnaround Time	Laboratory/ Organization (contact information)	Backup Laboratory/ Organization (contact information)
Soil	See worksheet #23	See worksheet #18	See worksheet #19	20 business days	Accutest Contact: Andrea Colby 4405 Vineland Road Suite C-15 Orlando, FL 32811 (386) 615-8479	Another laboratory in the Accutest network that maintains DoD ELAP and Virginia certification for the matrices, methods, and analytes listed in this SAP.

Accutest Florida has been selected to analyze samples for this project and has successfully completed the DoD Environmental Laboratory Accreditation Program (ELAP) certification, as provided in Attachment 1, for the matrices, methods, and analytes listed in this SAP. Accutest Florida is also certified by the Commonwealth of Virginia Department of General Services Division of Consolidated Laboratory Services with the following exceptions not listed on that certification:

- 8260C: Accutest Florida is only running 8260B method and the difference in methods does not affect the project DQOs
- 8270D missing 1,1-biphenyl; atrazine; benzaldehyde; caprolactam: these analytes were not offered when the certification was completed.
- 8015C missing TPH-ORO: this analyte were not offered when the certification was completed.

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**SAP Worksheet #31 – Planned Project Assessments Table**

<b>Assessment Type</b>	<b>Frequency</b>	<b>Internal or External</b>	<b>Organization Performing Assessment</b>	<b>Person(s) Responsible for Performing Assessment (Title and Organizational Affiliation)</b>	<b>Person(s) Responsible for Responding to Assessment Findings (Title and Organizational Affiliation)</b>	<b>Person(s) Responsible for Identifying and Implementing Corrective Actions (Title and Organizational Affiliation)</b>	<b>Person(s) Responsible for Monitoring Effectiveness of Corrective Actions (Title and Organizational Affiliation)</b>
Field Sampling Surveillance	Once during the project duration	Internal	TtEC	PQCM, TtEC	Project Manager, TtEC	Project Manager, TtEC	Project Manager and QCPM, TtEC
Management Review	Once during the project duration	Internal	TtEC	QCPM, TtEC	Project Manager, TtEC	Project Manager, TtEC	PQCM, TtEC

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**SAP Worksheet #32 – Assessment Findings and Corrective Action Responses**

<b>Assessment Type</b>	<b>Nature of Deficiencies Documentation</b>	<b>Individual(s) Notified of Findings (Title and Organizational Affiliation)</b>	<b>Time Frame of Notification</b>	<b>Nature of Corrective Action Response Documentation</b>	<b>Individual(s) Receiving Corrective Action Response (Title and Organizational Affiliation)</b>	<b>Time Frame for Response</b>
Field Sampling Surveillance	Surveillance Report	Project Manager, TtEC	7 days after completion of the inspection	Corrective Action Report	Project Manager and QCPM, TtEC	5 days after notification
Management Review	Surveillance Report	Project Manager, TtEC	7 days after completion of the inspection	Corrective Action Report	Project Manager, TtEC	14 days after notification

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**SAP Worksheet #33 – QA Management Reports Table**

<b>Type of Report</b>	<b>Frequency (daily, weekly monthly, quarterly, annually, etc.)</b>	<b>Projected Delivery Date(s)</b>	<b>Person(s) Responsible for Report Preparation (Title and Organizational Affiliation)</b>	<b>Report Recipient(s) (Title and Organizational Affiliation)</b>
Field Sampling Surveillance Report	Once during the project duration	Determined during the project	PQCM, TtEC	Project Manager and QCPM, TtEC
Management Review Report	Once after management review is completed	Determined during the project	QCPM, TtEC	Project Manager and Program Manager, TtEC

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**SAP Worksheet #34 – Verification (Step I) Process Table**

<b>Verification Input</b>	<b>Description</b>	<b>Internal/ External</b>	<b>Responsible for Verification (Title and Organizational Affiliation)</b>
Field logbook	Field logbooks will be reviewed weekly and verified for information accuracy and completeness. The inspection will be documented in daily QC reports.	I	PQCM, TtEC
COC records	COC records will be reviewed daily upon their completion and verified for completeness.	I	PQCM, TtEC Project Chemist, TtEC
Sample receipt	The Project Chemist will verify receipt of samples by the laboratory.	I	Project Chemist, TtEC
Sample logins	Sample login information will be reviewed and verified for accuracy and completeness in accordance with the requirements in this SAP.	E	Laboratory Project Manager, Accutest Florida
Laboratory analytical results prior to release	Laboratory analytical results will be reviewed to verify that the requirements in this SAP have been met. Prior to release, results will be verified as follows:	E	Laboratory Project Manager, Accutest Florida
	All analytical results (100 percent) comply with the method- and project-specific requirements and any deviations or failure to meet criteria is documented for the project file.	E	Analyst, Accutest Florida
	All manual entries (100 percent) are free of transcription errors and manual calculations are accurate; computer calculations are spot-checked to verify program validity; results reported are compliant with method- and project-specific QC requirements; raw data and supporting materials are complete; spectral assignments are confirmed; descriptions of deviations from method or project requirements are documented; significant figures and rounding have been appropriately used; reported values include dilution factors; and results are reasonable.	E	Peer Analyst, Accutest Florida
	Analytical results reported are compliant with method- and project-specific QC requirements; the reported information is complete; the information in the report narrative is complete and accurate; and results are reasonable.	E	Supervisor, Accutest Florida
	Analytical results reported are compliant with method- and project-specific QC; analytical methods are performed in compliance with approved SOPs. This review may be conducted after release of results since reviews are done only on 10 percent of the results.	E	Laboratory QA Manager, Accutest Florida

**SAP Worksheet #34 – Verification (Step I) Process Table (Continued)**

<b>Verification Input</b>	<b>Description</b>	<b>Internal/ External</b>	<b>Responsible for Verification (Title and Organizational Affiliation)</b>
Laboratory analytical results due at turnaround time listed on COC	Laboratory analytical results will be verified for having been obtained following the protocols in this SAP and being of sufficient quality to satisfy DQOs.	I	Project Chemist, TtEC
Laboratory data packages	Screening data reports and EPA Level IV-equivalent laboratory data packages will be verified by the laboratory performing the work for completeness and technical accuracy prior to submittal in accordance with requirements described in SAP Worksheet #29.	E I	Laboratory Project Manager, Accutest Florida Project Chemist, TtEC
Field and electronic data	One hundred percent of manual entries will be reviewed against the hardcopy information and 10 percent of electronic uploads will be checked against the hardcopy.	I	Project Chemist, TtEC

**SAP Worksheet #35 – Validation (Steps IIa and IIb) Process Table**

<b>Step IIa/IIb</b>	<b>Validation Input</b>	<b>Description</b>	<b>Responsible for Validation (Title and Organizational Affiliation)</b>
IIa	Sample Collection	Ensure that the sampling procedures described in this SAP were used to collect samples and that any deviations to those procedures were documented in a FCR.	PQCM, TtEC Project Chemist, TtEC
IIa	Sample Handling	Ensure that the procedures described in this SAP for sample handling, packaging, and transport to the laboratory were followed.	PQCM, TtEC Project Chemist, TtEC
IIa	Sample Documentation	Ensure that the COC procedures described in this SAP were followed for sample collection and that logbooks or field forms were completed as required.	PQCM, TtEC Project Chemist, TtEC
IIa	Analytical Procedures	Ensure that the analytical methods and deliverable requirements described in this SAP were followed including holding times, analyte lists, and QC criteria.	Laboratory Project Manager, Accutest Florida
IIa	Laboratory data reports	Data reports will be validated by the laboratory performing the work for technical accuracy and requirements listed in SAP Worksheet #29 prior to submittal.	Laboratory Project Manager, Accutest Florida
IIb	Sampling Procedures	Review of sampling procedures to appropriately document if any deviations occurred and if corrective action is required.	PQCM, TtEC
IIb	Analytical Procedures	Review of analytical procedures to appropriately document if any deviations occurred and if corrective action is required.	Project Chemist, TtEC
IIb	Project quantitation limits goals and Laboratory QC Criteria	Ensure project quantitation limits and laboratory QC criteria were followed and any deviations documented.	Project Chemist, TtEC

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### SAP Worksheet #36 – Analytical Data Validation (Steps IIa and IIb) Summary Table

<b>Step IIa/IIb</b>	<b>Matrix</b>	<b>Analytical Group</b>	<b>Validation Criteria</b>	<b>Data Validator (Title and Organizational Affiliation)</b>
IIa	All	All	In accordance with laboratory SOPs listed in SAP Worksheet #23	Project Chemist, TtEC
IIb	All	All	In accordance with DoD QSM criteria listed in SAP Worksheet #28	Project Chemist, TtEC

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## **SAP Worksheet #37 – Usability Assessment**

After the analytical results have been reviewed, verified, and validated in accordance with SAP Worksheets #34 through 36, a data quality assessment (DQA) report may be prepared to assess data quality and usability. The DQA will include review of the following:

- Sample collection and analytical methods to verify that these were performed as discussed in SAP Worksheets #14 and 17
- DQOs to determine whether they have been achieved by the data collected
- Project-specific data quality indicators for precision, accuracy, representativeness, completeness, and comparability (PARCC) parameters as discussed below

Analytical DQOs as assessed through the PARCC parameters are as follows:

### **Precision**

Precision is the measure of the reproducibility of a set of replicate results or the agreement among repeat observations made under the same conditions. Analytical precision is the measurement of the variability associated with duplicate or replicate analyses. As applicable, field duplicate, sample duplicate, and laboratory control sample duplicate (LCSD) samples will be used to assess field and analytical precision. The precision measurement will be determined using the RPD between the duplicate sample results as follows:

$$RPD = 100 \times 2 \times (\text{result} - \text{duplicate result}) / (\text{result} + \text{duplicate result})$$

As applicable, the RPD limits for laboratory duplicates and LCSD are presented in SAP Worksheet #28.

### **Accuracy**

Accuracy is defined as the nearness of a result or the mean of a set of results to the true or accepted value. Analytical accuracy is measured by comparing the percent recovery (%R) of analytes spiked into a sample against a control limit. Spiked samples include LCS or LCSD analyzed for every batch of up to 20 samples and serve as a measure of analytical accuracy. Surrogate standards, as applicable, are added to all samples, blanks, LCS, or LCSD and evaluate the method's accuracy and help to determine matrix interferences. %R is calculated as follows:

$$\%R = 100 \times (\text{spiked sample result} - \text{unspiked sample result}) / \text{amount of spike added}$$

As applicable, the laboratory will review the spiked sample and surrogate recoveries for each analysis to ensure that the %R lies within the control limits listed in SAP Worksheet #28.

### **Representativeness**

Unlike precision and accuracy, which can be expressed in quantitative terms, representativeness is a qualitative parameter. Representativeness is the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an

## **SAP Worksheet #37 – Usability Assessment (Continued)**

environmental condition. It is a qualitative parameter that depends on proper design of the sampling program.

Field personnel will be responsible for ensuring that samples are representative of field conditions by collecting and handling samples according to the procedures in this SAP. Errors in sample collection, packaging, preservation, or COC procedures may result in samples being judged non-representative and may form a basis for rejecting the data.

### **Completeness**

Completeness is the percentage of measurements made that is judged to be valid. The completeness goal is to generate a sufficient amount of valid data to meet project needs. Completeness is calculated and reported for each method, matrix, and analyte combination. The number of valid results divided by the number of possible individual analyte results, expressed as a percentage, determines the completeness of the data set. For completeness requirements, valid results are all results not qualified with a rejected (R) flag. The requirement of completeness is 95 percent for samples and is determined using the following equation:

$$\% \text{ completeness} = 100 \times (\text{number of valid analyte results} / \text{number of possible results})$$

### **Comparability**

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another, whether it was generated by a single laboratory or during interlaboratory studies. The use of standardized field and analytical procedures ensures comparability of analytical results.

Sample collection and handling procedures will adhere to EPA-approved protocols. Laboratory procedures will follow standard analytical protocols, use standard units and standardized report formats, follow the calculations as referenced in approved analytical methods, and use a standard statistical approach for QC measurements.

## REFERENCES

- CH2MHill. 2015. Draft Engineering Evaluation and Cost Analysis for Area of Concern 2 – Dextrose Dump, Naval Weapons Station Yorktown Cheatham Annex, Williamsburg, Virginia. January.
- DoD (Department of Defense). 2013. Quality Systems Manual for Environmental Laboratories. Version 5.0. July.
- EPA (U.S. Environmental Protection Agency). 2002. Guidance for Quality Assurance Project Plans, EPA QA/G-5, QAMS. December.
- . 2005. Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP). March.
- . 2006a. EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5, QAMS. May.
- . 2006b. Guidance on Systematic Planning using the Data Quality Objectives Process, EPA QA/G-4, QAMS. February.

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**ATTACHMENT 1**  
**LABORATORY DOD ELAP ACCREDITATION**

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## Scope of Accreditation For Accutest Laboratories Southeast, Inc.

4405 Vineland Road, Suite C-15  
Orlando, FL 32811  
Svetlana Izosimova, Ph.D., QA Officer  
407-425-6700

In recognition of a successful assessment to ISO/IEC 17025:2005 and the requirements of the DoD Environmental Laboratory Accreditation Program (LABPR 403 DoD ELAP) as detailed in the DoD Quality Systems Manual for Environmental Laboratories (DoD QSM V5) based on the TNI Standard - Environmental Laboratory Sector, Volume 1 – Management and Technical Requirements for Laboratories Performing Environmental Analysis, Sept 2009 (EL-V1-2009); accreditation is granted to **Accutest Laboratories Southeast, Inc.** to perform the following tests:

Accreditation granted through: **December 15, 2015**

### Testing – Environmental

Drinking Water		
Technology	Method	Analyte
LC/MS/MS	EPA 537	Perfluorohexanoic Acid
LC/MS/MS	EPA 537	Perfluoroheptanoic Acid
LC/MS/MS	EPA 537	Perfluorooctanoic Acid
LC/MS/MS	EPA 537	Perfluorononanoic Acid
LC/MS/MS	EPA 537	Perfluorodecanoic Acid
LC/MS/MS	EPA 537	Perfluoroundecanoic Acid
LC/MS/MS	EPA 537	Perfluorododecanoic Acid
LC/MS/MS	EPA 537	Perfluorotridecanoic Acid
LC/MS/MS	EPA 537	Perfluorotetradecanoic Acid
LC/MS/MS	EPA 537	Perfluorobutanesulfonic Acid
LC/MS/MS	EPA 537	Perfluorohexanesulfonic Acid
LC/MS/MS	EPA 537	Perfluorooctanesulfonic Acid

Non-Potable Water		
Technology	Method	Analyte
GC/ECD	EPA 8011	1,2-Dibromoethane (EDB)
GC/ECD	EPA 8011	1,2-Dibromo-3-Chloropropane (DBCP)
GC/FID	EPA 8015C/D	Diesel range organics (DRO)
GC/FID	EPA 8015C/D	Oil Range Organics (ORO)

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
GC/FID	EPA 8015C/D	Gasoline range organics (GRO)
GC/FID	EPA 8015C/D	Ethanol
GC/FID	EPA 8015C/D	2-Ethoxyethanol
GC/FID	EPA 8015C/D	Isobutyl alcohol (2-Methyl-1-propanol)
GC/FID	EPA 8015C/D	Isopropyl alcohol (2-Propanol)
GC/FID	EPA 8015C/D	Methanol
GC/FID	EPA 8015C/D	n-Butyl alcohol
GC/FID	EPA 8015C/D	n-Propanol
GC/PID	EPA 602; EPA 8021B	Benzene
GC/PID	EPA 602; EPA 8021B	Ethylbenzene
GC/PID	EPA 602; EPA 8021B	Chlorobenzene
GC/PID	EPA 602; EPA 8021B	Toluene
GC/PID	EPA 602; EPA 8021B	1,2-Dichlorobenzene (o-Dichlorobenzene)
GC/PID	EPA 602; EPA 8021B	1,3-Dichlorobenzene (m-Dichlorobenzene)
GC/PID	EPA 602; EPA 8021B	1,4-Dichlorobenzene (p-Dichlorobenzene)
GC/PID	EPA 602; EPA 8021B	m,p-Xylene
GC/PID	EPA 602; EPA 8021B	o-Xylene
GC/PID	EPA 602; EPA 8021B	Methyl-tert-Butyl Ether
GC/ECD	EPA 608; EPA 8081B	4,4' -DDD
GC/ECD	EPA 608; EPA 8081B	4,4' -DDE
GC/ECD	EPA 608; EPA 8081B	4,4' -DDT
GC/ECD	EPA 608; EPA 8081B	Aldrin
GC/ECD	EPA 608; EPA 8081B	alpha-BHC (alpha-Hexachlorocyclohexane)
GC/ECD	EPA 608; EPA 8081B	beta-BHC (beta-Hexachlorocyclohexane)
GC/ECD	EPA 608; EPA 8081B	delta-BHC
GC/ECD	EPA 608; EPA 8081B	gamma-BHC (Lindane gamma-Hexachlorocyclohexane)
GC/ECD	EPA 608; EPA 8081B	Chlordane (tech.)
GC/ECD	EPA 608; EPA 8081B	alpha-Chlordane
GC/ECD	EPA 608; EPA 8081B	gamma-Chlordane
GC/ECD	EPA 608; EPA 8081B	Dieldrin
GC/ECD	EPA 608; EPA 8081B	Endosulfan I
GC/ECD	EPA 608; EPA 8081B	Endosulfan II
GC/ECD	EPA 608; EPA 8081B	Endosulfan sulfate
GC/ECD	EPA 608; EPA 8081B	Endrin
GC/ECD	EPA 608; EPA 8081B	Endrin aldehyde
GC/ECD	EPA 608; EPA 8081B	Endrin ketone
GC/ECD	EPA 608; EPA 8081B	Heptachlor
GC/ECD	EPA 608; EPA 8081B	Heptachlor epoxide
GC/ECD	EPA 608; EPA 8081B	Methoxychlor
GC/ECD	EPA 608; EPA 8081B	Toxaphene (Chlorinated camphene)
GC/ECD	EPA 608; EPA 8082A	Aroclor-1016 (PCB-1016)

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
GC/ECD	EPA 608; EPA 8082A	Aroclor-1221 (PCB-1221)
GC/ECD	EPA 608; EPA 8082A	Aroclor-1232 (PCB-1232)
GC/ECD	EPA 608; EPA 8082A	Aroclor-1242 (PCB-1242)
GC/ECD	EPA 608; EPA 8082A	Aroclor-1248 (PCB-1248)
GC/ECD	EPA 608; EPA 8082A	Aroclor-1254 (PCB-1254)
GC/ECD	EPA 608; EPA 8082A	Aroclor-1260 (PCB-1260)
GC/ECD	EPA 8082A	Aroclor-1262 (PCB-1262)
GC/ECD	EPA 8082A	Aroclor-1268 (PCB-1268)
GC/ECD	EPA 8082A	2,4'-diCB bz8
GC/ECD	EPA 8082A	2,2',5-trCB bz18
GC/ECD	EPA 8082A	2,4,4'-trCB bz28
GC/ECD	EPA 8082A	2,2',3,5'-teCB bz44
GC/ECD	EPA 8082A	2,2',4,5'-teCB bz49
GC/ECD	EPA 8082A	2,2',5,5'-teCB bz52
GC/ECD	EPA 8082A	2,3'4,4'-teCB bz66
GC/ECD	EPA 8082A	3,4,4',5-teCB bz81
GC/ECD	EPA 8082A	2,2',3,4,5'-peCB bz87
GC/ECD	EPA 8082A	2,2',3,4',5-peCB bz90
GC/ECD	EPA 8082A	2,2',4,5,5'-peCB bz101
GC/ECD	EPA 8082A	2,3,3',4,4'-peCB bz105
GC/ECD	EPA 8082A	2,3',4,4',5-peCB bz118
GC/ECD	EPA 8082A	2',3,4,4',5-peCB bz123
GC/ECD	EPA 8082A	3,3',4,4',5-peCB bz126
GC/ECD	EPA 8082A	2,2',3,3',4,4'-hxCB bz128
GC/ECD	EPA 8082A	2,2',3,4,4',5'-hxCB bz138
GC/ECD	EPA 8082A	2,2',3,5,5',6-hxCB bz151
GC/ECD	EPA 8082A	2,2',4,4',5,5'-hxCB bz153
GC/ECD	EPA 8082A	2,3,3',4,4',5-hxCB bz156
GC/ECD	EPA 8082A	2,3,3',4,4',5'-hxCB bz157
GC/ECD	EPA 8082A	2,3',4,4',5,5'-hxCB bz167
GC/ECD	EPA 8082A	3,3',4,4',5,5'-hxCB bz169
GC/ECD	EPA 8082A	2,2',3,3',4,4',5-hpCB bz170
GC/ECD	EPA 8082A	2,2',3,4,4',5,5'-hpCB bz180
GC/ECD	EPA 8082A	2,2',3,4,4',5',6-hpCB bz183
GC/ECD	EPA 8082A	2,2',3,4,4',6,6'-hpCB bz184
GC/ECD	EPA 8082A	2,2',3,4',5,5',6-hpCB bz187
GC/ECD	EPA 8082A	2,3,3',4,4',5,5'-hpCB bz189
GC/ECD	EPA 8082A	2,2',3,3',4,4',5,6-ocCB bz195
GC/ECD	EPA 8082A	2,2',3,3',4,4',5,5',6-noCB bz206
GC/ECD	EPA 8082A	Decachlorobiphenyl bz209
GC/ECD	EPA 8091	2,4-Dinitrotoluene (2,4-DNT)
GC/ECD	EPA 8091	2,6-Dinitrotoluene (2,6-DNT)

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
GC/FPD	EPA 8141B	Azinphos-methyl (Guthion)
GC/FPD	EPA 8141B	Bolstar (Sulprofos)
GC/FPD	EPA 8141B	Carbophenothion
GC/FPD	EPA 8141B	Chlorpyrifos
GC/FPD	EPA 8141B	Coumaphos
GC/FPD	EPA 8141B	Demeton-o
GC/FPD	EPA 8141B	Demeton-s
GC/FPD	EPA 8141B	Diazinon
GC/FPD	EPA 8141B	Dichlorvos (DDVP Dichlorvos)
GC/FPD	EPA 8141B	Dimethoate
GC/FPD	EPA 8141B	Disulfoton
GC/FPD	EPA 8141B	EPN
GC/FPD	EPA 8141B	Ethion
GC/FPD	EPA 8141B	Ethoprop
GC/FPD	EPA 8141B	Famphur
GC/FPD	EPA 8141B	Fensulfothion
GC/FPD	EPA 8141B	Fenthion
GC/FPD	EPA 8141B	Malathion
GC/FPD	EPA 8141B	Merphos
GC/FPD	EPA 8141B	Methyl parathion (Parathion methyl)
GC/FPD	EPA 8141B	Mevinphos
GC/FPD	EPA 8141B	Monocrotophos
GC/FPD	EPA 8141B	Naled
GC/FPD	EPA 8141B	Parathion ethyl
GC/FPD	EPA 8141B	Phorate
GC/FPD	EPA 8141B	Ronnel
GC/FPD	EPA 8141B	Stirofos
GC/FPD	EPA 8141B	Sulfotepp
GC/FPD	EPA 8141B	Tetraethyl pyrophosphate (TEPP)
GC/FPD	EPA 8141B	Thionazin (Zinophos)
GC/FPD	EPA 8141B	Tokuthion (Prothiophos)
GC/FPD	EPA 8141B	Trichloronate
GC/FPD	EPA 8141B	O,O,O-Triethyl phosphorothioate
GC/ECD	EPA 8151A	2,4,5-T
GC/ECD	EPA 8151A	2,4-D
GC/ECD	EPA 8151A	2,4-DB
GC/ECD	EPA 8151A	Dalapon
GC/ECD	EPA 8151A	Dicamba
GC/ECD	EPA 8151A	Dichloroprop (Dichlorprop)
GC/ECD	EPA 8151A	Dinoseb (2-sec-butyl-4,6-dinitrophenol DNBP)
GC/ECD	EPA 8151A	MCPA

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
GC/ECD	EPA 8151A	MCPPP
GC/ECD	EPA 8151A	Pentachlorophenol
GC/ECD	EPA 8151A	Silvex (2,4,5-TP)
GC/FID	RSK-175	Acetylene
GC/FID	RSK-175	Methane
GC/FID	RSK-175	Ethane
GC/FID	RSK-175	Ethene
GC/FID	RSK-175	Propane
GC/FID	FL-PRO	Total Petroleum Hydrocarbons (TPH)
GC/FID	MA-VPH	Volatile petroleum range organics (VPH)
GC/FID	MA-EPH	Extractable petroleum range organics (EPH)
GC/FID	IA-OA1	Gasoline range organics (GRO)
GC/FID	IA-OA2	Diesel range organics (DRO)
GC/FID	TN-GRO	Gasoline range organics (GRO)
GC/FID	TN-EPH	Extractable petroleum range organics (EPH)
GC/FID	WI-DRO	Diesel range organics (DRO)
GC/FID	AK-101	Gasoline range organics (GRO)
GC/FID	AK-102	Diesel range organics (DRO)
GC/FID	OK-GRO	Gasoline range organics (GRO)
GC/FID	OK-DRO	Diesel range organics (DRO)
GC/FID	TX-1005	Total Petroleum Hydrocarbons (TPH)
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	1,1,1,2-Tetrachloroethane
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	1,1,1-Trichloroethane
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	1,1,2,2-Tetrachloroethane
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	1,1,2-Trichloroethane
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	1,1-Dichloroethane
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	1,1-Dichloroethylene
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	1,1-Dichloropropene
GC/MS	EPA 624; EPA 8260B/C	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	1,2,3-Trichlorobenzene
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	1,2,3-Trichloropropane
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	1,2,4-Trichlorobenzene
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	1,2,4-Trimethylbenzene
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	1,2-Dibromo-3-chloropropane (DBCP)
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	1,2-Dibromoethane (EDB Ethylene dibromide)
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	1,2-Dichlorobenzene (o-Dichlorobenzene)
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	1,2-Dichloroethane
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	1,2-Dichloropropane
GC/MS	EPA 8260B/C	1,2-Dichlorotrifluoroethane (Freon 123)
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	1,3,5-Trimethylbenzene

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	1,3-Dichlorobenzene (m-Dichlorobenzene)
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	1,3-Dichloropropane
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	1,4-Dichlorobenzene (p-Dichlorobenzene)
GC/MS	EPA 8260B/C	1-Chlorohexane
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	2,2-Dichloropropane
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	2-Butanone (Methyl ethyl ketone MEK)
GC/MS	EPA 624; EPA 8260B/C	2-Chloroethyl vinyl ether
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	2-Chlorotoluene
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	2-Hexanone
GC/MS	EPA 8260B/C	2-Nitropropane
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	4-Chlorotoluene
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	4-Methyl-2-pentanone (MIBK)
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Acetone
GC/MS	EPA 8260B/C	Acetonitrile
GC/MS	EPA 624; EPA 8260B/C	Acrolein (Propenal)
GC/MS	EPA 624; EPA 8260B/C	Acrylonitrile
GC/MS	EPA 8260B/C	Allyl chloride (3-Chloropropene)
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Benzene
GC/MS	EPA 8260B/C	Benzyl Chloride
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Bromobenzene
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Bromochloromethane
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Bromodichloromethane
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Bromoform
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	n-Butylbenzene
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	sec-Butylbenzene
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	tert-Butylbenzene
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Carbon disulfide
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Carbon tetrachloride
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Chlorobenzene
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Chloroethane
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Chloroform
GC/MS	EPA 8260B/C	Chloroprene
GC/MS	EPA 624; EPA 8260B,C	Cyclohexane
GC/MS	EPA 8260B/C	Cyclohexanone
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	cis-1,2-Dichloroethylene
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	trans-1,2-Dichloroethylene
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	cis-1,3-Dichloropropene
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	trans-1,3-Dichloropropylene
GC/MS	EPA 8260B/C	cis-1,4-Dichloro-2-butene
GC/MS	EPA 8260B/C	trans-1,4-Dichloro-2-butene
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Di-isopropylether (DIPE)

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Dibromochloromethane
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Dibromomethane (Methylene Bromide)
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Dichlorodifluoromethane
GC/MS	EPA 8260B/C	Diethyl ether
GC/MS	EPA 624, EPA 8260B/C, EPA 8260B/C SIM	p-Dioxane (1,4-Dioxane)
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Ethanol (Ethyl Alcohol)
GC/MS	EPA 8260B/C	Ethyl acetate
GC/MS	EPA 8260B/C	Ethyl methacrylate
GC/MS	EPA 8260B/C	Ethyl tert-butyl alcohol (ETBA)
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Ethyl tert-butyl ether (ETBE)
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Ethylbenzene
GC/MS	EPA 8260B/C	Ethylene Oxide
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Hexachlorobutadiene
GC/MS	EPA 8260B/C	Hexane
GC/MS	EPA 8260B/C	Iodomethane (Methyl iodide)
GC/MS	EPA 8260B/C	Isobutyl alcohol (2-Methyl-1-propanol)
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	p-Isopropyltoluene
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Isopropylbenzene
GC/MS	EPA 8260B/C	Methacrylonitrile
GC/MS	EPA 624; EPA 8260B/C	Methyl Acetate
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Methyl bromide (Bromomethane)
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Methyl chloride (Chloromethane)
GC/MS	EPA 624; EPA 8260B,C	Methylcyclohexane
GC/MS	EPA 8260B/C	Methyl methacrylate
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Methyl tert-butyl ether (MTBE)
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Methylene chloride
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Naphthalene
GC/MS	EPA 8260B/C	Pentachloroethane
GC/MS	EPA 8260B/C	Propionitrile (Ethyl cyanide)
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	n-Propylbenzene
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Styrene
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	tert-Amyl alcohol (TAA)
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	tert-Amyl methyl ether (TAME)
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	tert-Butyl alcohol (TBA)
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	tert-Butyl formate (TBF)
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Tetrachloroethylene (Perchloroethylene)
GC/MS	EPA 8260B/C	Tetrahydrofuran
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Toluene
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Trichloroethene (Trichloroethylene)
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Trichlorofluoromethane
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Vinyl acetate
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Vinyl chloride

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	Xylene (total)
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	m,p-Xylene
GC/MS	EPA 624; SM 6200B-11; EPA 8260B/C	o-Xylene
GC/MS	EPA 625; EPA 8270D	1,2,4,5-Tetrachlorobenzene
GC/MS	EPA 625; EPA 8270D	1,2,4-Trichlorobenzene
GC/MS	EPA 625; EPA 8270D	1,2-Dichlorobenzene (o-Dichlorobenzene)
GC/MS	EPA 625; EPA 8270D	1,2-Diphenylhydrazine
GC/MS	EPA 8270D	1,3,5-Trinitrobenzene (1,3,5-TNB)
GC/MS	EPA 625; EPA 8270D	1,3-Dichlorobenzene (m-Dichlorobenzene)
GC/MS	EPA 8270D	1,3-Dinitrobenzene (1,3-DNB)
GC/MS	EPA 625; EPA 8270D	1,4-Dichlorobenzene (p-Dichlorobenzene)
GC/MS	EPA 8270D	1,4-Dithiane
GC/MS	EPA 8270D	1,4-Oxathiane
GC/MS	EPA 8270D	1,4-Naphthoquinone
GC/MS	EPA 8270D	1,4-Phenylenediamine
GC/MS	EPA 8270D	1-Chloronaphthalene
GC/MS	EPA 625; EPA 8270D; EPA 8270D SIM	1-Methylnaphthalene
GC/MS	EPA 8270D	1-Naphthylamine
GC/MS	EPA 625; EPA 8270D	2,3,4,6-Tetrachlorophenol
GC/MS	EPA 625; EPA 8270D	2,4,5-Trichlorophenol
GC/MS	EPA 625; EPA 8270D	2,4,6-Trichlorophenol
GC/MS	EPA 625; EPA 8270D	2,4-Dichlorophenol
GC/MS	EPA 625; EPA 8270D	2,4-Dimethylphenol
GC/MS	EPA 625; EPA 8270D	2,4-Dinitrophenol
GC/MS	EPA 625; EPA 8270D	2,4-Dinitrotoluene (2,4-DNT)
GC/MS	EPA 8270D	2,6-Dichlorophenol
GC/MS	EPA 625; EPA 8270D	2,6-Dinitrotoluene (2,6-DNT)
GC/MS	EPA 8270D	2-Acetylaminofluorene
GC/MS	EPA 625; EPA 8270D	2-Chloronaphthalene
GC/MS	EPA 625; EPA 8270D	2-Chlorophenol
GC/MS	EPA 625; EPA 8270D	2-Methyl-4,6-dinitrophenol (4,6-Dinitro-o-cresol)
GC/MS	EPA 625; EPA 8270D; EPA 8270D SIM	2-Methylnaphthalene
GC/MS	EPA 625; EPA 8270D	2-Methylphenol (o-Cresol)
GC/MS	EPA 8270D	2-Naphthylamine
GC/MS	EPA 625; EPA 8270D	2-Nitroaniline
GC/MS	EPA 625; EPA 8270D	2-Nitrophenol
GC/MS	EPA 8270D	2-Picoline (2-Methylpyridine)
GC/MS	EPA 625; EPA 8270D	3,3'-Dichlorobenzidine
GC/MS	EPA 8270D	3,3'-Dimethylbenzidine
GC/MS	EPA 8270D	3-Methylcholanthrene
GC/MS	EPA 625; EPA 8270D	3&4-Methylphenol (m,p-Cresol)

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
GC/MS	EPA 625; EPA 8270D	3-Nitroaniline
GC/MS	EPA 8270D	4-Aminobiphenyl
GC/MS	EPA 625; EPA 8270D	4-Bromophenyl phenyl ether
GC/MS	EPA 625; EPA 8270D	4-Chloro-3-methylphenol
GC/MS	EPA 625; EPA 8270D	4-Chloroaniline
GC/MS	EPA 625; EPA 8270D	4-Chlorophenyl phenylether
GC/MS	EPA 8270D	4-Dimethyl aminoazobenzene
GC/MS	EPA 625; EPA 8270D	4-Nitroaniline
GC/MS	EPA 625; EPA 8270D	4-Nitrophenol
GC/MS	EPA 8270D	4,4'-methylene-bis(2-chloroaniline)
GC/MS	EPA 8270D	5-Nitro-o-toluidine
GC/MS	EPA 8270D	7,12-Dimethylbenz(a) anthracene
GC/MS	EPA 625; EPA 8270D; EPA 8270D SIM	Acenaphthene
GC/MS	EPA 625; EPA 8270D; EPA 8270D SIM	Acenaphthylene
GC/MS	EPA 625; EPA 8270D	Acetophenone
GC/MS	EPA 625; EPA 8270D	Aniline
GC/MS	EPA 8270D	Anilazine
GC/MS	EPA 625; EPA 8270D; EPA 8270D SIM	Anthracene
GC/MS	EPA 8270D	Aramite
GC/MS	EPA 625; EPA 8270D	Atrazine
GC/MS	EPA 625; EPA 8270D	Benzaldehyde
GC/MS	EPA 625; EPA 8270D	Benzidine
GC/MS	EPA 625; EPA 8270D; EPA 8270D SIM	Benzo(a)anthracene
GC/MS	EPA 625; EPA 8270D; EPA 8270D SIM	Benzo(a)pyrene
GC/MS	EPA 625; EPA 8270D; EPA 8270D SIM	Benzo(b)fluoranthene
GC/MS	EPA 625; EPA 8270D; EPA 8270D SIM	Benzo(g,h,i)perylene
GC/MS	EPA 625; EPA 8270D; EPA 8270D SIM	Benzo(k)fluoranthene
GC/MS	EPA 625; EPA 8270D	Benzoic acid
GC/MS	EPA 625; EPA 8270D	Benzyl alcohol
GC/MS	EPA 625; EPA 8270D	Biphenyl (1,1'-Biphenyl)
GC/MS	EPA 625; EPA 8270D	bis(2-Chloroethoxy)methane
GC/MS	EPA 625; EPA 8270D	bis(2-Chloroethyl) ether
GC/MS	EPA 625; EPA 8270D	bis(2-Chloroisopropyl) ether (2,2'-Oxybis(1-chloropropane))
GC/MS	EPA 625; EPA 8270D	bis(2-Ethylhexyl) phthalate (DEHP)
GC/MS	EPA 625; EPA 8270D	Butyl benzyl phthalate
GC/MS	EPA 625; EPA 8270D	Carbazole
GC/MS	EPA 625; EPA 8270D	Caprolactam
GC/MS	EPA 8270D	Chlorobenzilate
GC/MS	EPA 625; EPA 8270D; EPA 8270D SIM	Chrysene
GC/MS	EPA 8270D	Diallate
GC/MS	EPA 625; EPA 8270D	Di-n-butyl phthalate

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
GC/MS	EPA 625; EPA 8270D	Di-n-octyl phthalate
GC/MS	EPA 625; EPA 8270D; EPA 8270D SIM	Dibenz(a,h)anthracene
GC/MS	EPA 8270D	Dibenz(a,j)acridine
GC/MS	EPA 625; EPA 8270D	Dibenzofuran
GC/MS	EPA 625; EPA 8270D	Diethyl phthalate
GC/MS	EPA 625; EPA 8270D	Dimethyl phthalate
GC/MS	EPA 8270D	a,a-Dimethylphenethylamine
GC/MS	EPA 8270D	Diphenyl Ether
GC/MS	EPA 8270D	p-Dioxane (1,4-Dioxane)
GC/MS	EPA 8270D	Ethyl methanesulfonate
GC/MS	EPA 625; EPA 8270D; EPA 8270D SIM	Fluoranthene
GC/MS	EPA 625; EPA 8270D; EPA 8270D SIM	Fluorene
GC/MS	EPA 625; EPA 8270D	Hexachlorobenzene
GC/MS	EPA 625; EPA 8270D	Hexachlorobutadiene
GC/MS	EPA 625; EPA 8270D	Hexachlorocyclopentadiene
GC/MS	EPA 625; EPA 8270D	Hexachloroethane
GC/MS	EPA 8270D	Hexachlorophene
GC/MS	EPA 8270D	Hexachloropropene
GC/MS	EPA 625; EPA 8270D; EPA 8270D SIM	Indeno(1,2,3-cd)pyrene
GC/MS	EPA 8270D	Isodrin
GC/MS	EPA 625; EPA 8270D	Isophorone
GC/MS	EPA 8270D	Isosafrole
GC/MS	EPA 8270D	Kepone
GC/MS	EPA 8270D	Methapyrilene
GC/MS	EPA 8270D	Methyl methanesulfonate
GC/MS	EPA 625; EPA 8270D; EPA 8270D SIM	Naphthalene
GC/MS	EPA 8270D	Nicotine
GC/MS	EPA 625; EPA 8270D	Nitrobenzene
GC/MS	EPA 8270D	Nitroquinoline-1-oxide
GC/MS	EPA 8270D	n-Nitroso-di-n-butylamine
GC/MS	EPA 625; EPA 8270D	n-Nitrosodi-n-propylamine
GC/MS	EPA 8270D	n-Nitrosodiethylamine
GC/MS	EPA 625; EPA 8270D	n-Nitrosodimethylamine
GC/MS	EPA 625; EPA 8270D	n-Nitrosodiphenylamine
GC/MS	EPA 8270D	n-Nitrosodiphenylamine/Diphenylamine (analyte pair)
GC/MS	EPA 8270D	n-Nitrosomethylethylamine
GC/MS	EPA 8270D	n-Nitrosomorpholine
GC/MS	EPA 8270D	n-Nitrosopiperidine
GC/MS	EPA 8270D	n-Nitrosopyrrolidine
GC/MS	EPA 8270D	Pentachlorobenzene
GC/MS	EPA 8270D	Pentachloroethane

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
GC/MS	EPA 8270D	Pentachloronitrobenzene
GC/MS	EPA 625; EPA 8270D; EPA 8270D SIM	Pentachlorophenol
GC/MS	EPA 8270D	Phenacetin
GC/MS	EPA 625; EPA 8270D; EPA 8270D SIM	Phenanthrene
GC/MS	EPA 625; EPA 8270D	Phenol
GC/MS	EPA 8270D	Pronamide (Kerb)
GC/MS	EPA 8270D	Propazine
GC/MS	EPA 625; EPA 8270D; EPA 8270D SIM	Pyrene
GC/MS	EPA 625; EPA 8270D	Pyridine
GC/MS	EPA 8270D	Resorcinol
GC/MS	EPA 8270D	Safrole
GC/MS	EPA 8270D	Simazine
GC/MS	EPA 8270D	o-Toluidine
GC/MS	EPA 8270D	Dimethoate
GC/MS	EPA 8270D	Disulfoton
GC/MS	EPA 8270D	Famphur
GC/MS	EPA 8270D	Methyl parathion (Parathion methyl)
GC/MS	EPA 8270D	Parathion ethyl
GC/MS	EPA 8270D	Phorate
GC/MS	EPA 8270D	O,O,O-Triethyl phosphorothioate
HPLC	EPA 610; EPA 8310	1-Methylnaphthalene
HPLC	EPA 610; EPA 8310	2-Methylnaphthalene
HPLC	EPA 610; EPA 8310	Acenaphthene
HPLC	EPA 610; EPA 8310	Acenaphthylene
HPLC	EPA 610; EPA 8310	Anthracene
HPLC	EPA 610; EPA 8310	Benzo(a)anthracene
HPLC	EPA 610; EPA 8310	Benzo(a)pyrene
HPLC	EPA 610; EPA 8310	Benzo(b)fluoranthene
HPLC	EPA 610; EPA 8310	Benzo(g h i)perylene
HPLC	EPA 610; EPA 8310	Benzo(k)fluoranthene
HPLC	EPA 610; EPA 8310	Chrysene
HPLC	EPA 610; EPA 8310	Dibenz(a,h)anthracene
HPLC	EPA 610; EPA 8310	Fluoranthene
HPLC	EPA 610; EPA 8310	Fluorene
HPLC	EPA 610; EPA 8310	Indeno(1,2,3-cd)pyrene
HPLC	EPA 610; EPA 8310	Naphthalene
HPLC	EPA 610; EPA 8310	Phenanthrene
HPLC	EPA 610; EPA 8310	Pyrene
HPLC	EPA 8330A/B	1,3,5-Trinitrobenzene (1,3,5-TNB)
HPLC	EPA 8330A/B	1,3-Dinitrobenzene (1,3-DNB)
HPLC	EPA 8330A/B	2,4,6-Trinitrotoluene (2,4,6-TNT)
HPLC	EPA 8330A/B	2,4-Dinitrotoluene (2,4-DNT)

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
HPLC	EPA 8330A/B	2,6-Dinitrotoluene (2,6-DNT)
HPLC	EPA 8330A/B	2-Amino-4,6-dinitrotoluene (2-am-dnt)
HPLC	EPA 8330A/B	2-Nitrotoluene
HPLC	EPA 8330A/B	3,5-Dinitroaniline
HPLC	EPA 8330A/B	3-Nitrotoluene
HPLC	EPA 8330A/B	4-Amino-2,6-dinitrotoluene (4-am-dnt)
HPLC	EPA 8330A/B	4-Nitrotoluene
HPLC	EPA 8330A/B	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)
HPLC	EPA 8330A/B	Nitrobenzene
HPLC	EPA 8330A/B; EPA 8332	Nitroglycerin
HPLC	EPA 8330A/B	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)
HPLC	EPA 8330A/B	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)
HPLC	EPA 8330A/B; EPA 8332	Pentaerythritoltetranitrate (PETN)
HPLC	EPA 8330A	2,2',6,6'-Tetranitro-4,4'-azoxytoluene
HPLC	EPA 8330A/B	2-amino-6-Nitrotoluene
HPLC	EPA 8330A/B	4-amino-2-Nitrotoluene
HPLC	EPA 8330A/B	2-amino-4-Nitrotoluene
HPLC	EPA 8330A/B	2,4-diamino-6-Nitrotoluene
HPLC	EPA 8330A/B	2,6-diamino-4-Nitrotoluene
HPLC	EPA 8330A/B	DNX
HPLC	EPA 8330A/B	MNX
HPLC	EPA 8330A/B	TNX
LC/MS/MS	EPA 6850	Perchlorate
LC/MS/MS	EPA 537 MOD	Perfluorobutanoic Acid
LC/MS/MS	EPA 537 MOD	Perfluoropentanoic Acid
LC/MS/MS	EPA 537 MOD	Perfluorohexanoic Acid
LC/MS/MS	EPA 537 MOD	Perfluoroheptanoic Acid
LC/MS/MS	EPA 537 MOD	Perfluorooctanoic Acid
LC/MS/MS	EPA 537 MOD	Perfluorononanoic Acid
LC/MS/MS	EPA 537 MOD	Perfluorodecanoic Acid
LC/MS/MS	EPA 537 MOD	Perfluoroundecanoic Acid
LC/MS/MS	EPA 537 MOD	Perfluorododecanoic Acid
LC/MS/MS	EPA 537 MOD	Perfluorotridecanoic Acid
LC/MS/MS	EPA 537 MOD	Perfluorotridecanoic Acid
LC/MS/MS	EPA 537 MOD	Perfluorotetradecanoic Acid
LC/MS/MS	EPA 537 MOD	Perfluorobutanesulfonic Acid
LC/MS/MS	EPA 537 MOD	Perfluorohexanesulfonic Acid
LC/MS/MS	EPA 537 MOD	Perfluorooctanesulfonic Acid
LC/MS/MS	EPA 537 MOD	Perfluorodecanesulfonic Acid
LC/MS/MS	EPA 537 MOD	Perfluorooctanesulfonic Acid
LC/MS/MS	EPA 537 MOD	Perfluorodecanesulfonic Acid

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
ICP	EPA 200.7; EPA 6010C	Aluminum
ICP	EPA 200.7; EPA 6010C	Antimony
ICP	EPA 200.7; EPA 6010C	Arsenic
ICP	EPA 200.7; EPA 6010C	Barium
ICP	EPA 200.7; EPA 6010C	Beryllium
ICP	EPA 200.7; EPA 6010C	Cadmium
ICP	EPA 200.7; EPA 6010C	Calcium
ICP	EPA 200.7; EPA 6010C	Chromium
ICP	EPA 200.7; EPA 6010C	Cobalt
ICP	EPA 200.7; EPA 6010C	Copper
ICP	EPA 200.7; EPA 6010C	Iron
ICP	EPA 200.7; EPA 6010C	Lead
ICP	EPA 200.7; EPA 6010C	Magnesium
ICP	EPA 200.7; EPA 6010C	Manganese
ICP	EPA 200.7; EPA 6010C	Molybdenum
ICP	EPA 200.7; EPA 6010C	Nickel
ICP	EPA 200.7; EPA 6010C	Potassium
ICP	EPA 200.7; EPA 6010C	Selenium
ICP	EPA 200.7; EPA 6010C	Silver
ICP	EPA 200.7; EPA 6010C	Sodium
ICP	EPA 200.7; EPA 6010C	Strontium
ICP	EPA 200.7; EPA 6010C	Thallium
ICP	EPA 200.7; EPA 6010C	Tin
ICP	EPA 200.7; EPA 6010C	Titanium
ICP	EPA 200.7; EPA 6010C	Vanadium
ICP	EPA 200.7; EPA 6010C	Zinc
ICP/MS	EPA 200.8; EPA 6020A	Aluminum
ICP/MS	EPA 200.8; EPA 6020A	Antimony
ICP/MS	EPA 200.8; EPA 6020A	Arsenic
ICP/MS	EPA 200.8; EPA 6020A	Barium
ICP/MS	EPA 200.8; EPA 6020A	Beryllium
ICP/MS	EPA 200.8; EPA 6020A	Cadmium
ICP/MS	EPA 200.8; EPA 6020A	Calcium
ICP/MS	EPA 200.8; EPA 6020A	Chromium
ICP/MS	EPA 200.8; EPA 6020A	Cobalt
ICP/MS	EPA 200.8; EPA 6020A	Copper
ICP/MS	EPA 200.8; EPA 6020A	Iron
ICP/MS	EPA 200.8; EPA 6020A	Lead
ICP/MS	EPA 200.8; EPA 6020A	Magnesium
ICP/MS	EPA 200.8; EPA 6020A	Manganese
ICP/MS	EPA 200.8; EPA 6020A	Molybdenum
ICP/MS	EPA 200.8; EPA 6020A	Nickel

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
ICP/MS	EPA 200.8; EPA 6020A	Potassium
ICP/MS	EPA 200.8; EPA 6020A	Selenium
ICP/MS	EPA 200.8; EPA 6020A	Silver
ICP/MS	EPA 200.8; EPA 6020A	Sodium
ICP/MS	EPA 200.8; EPA 6020A	Strontium
ICP/MS	EPA 200.8; EPA 6020A	Thallium
ICP/MS	EPA 200.8; EPA 6020A	Tin
ICP/MS	EPA 200.8; EPA 6020A	Titanium
ICP/MS	EPA 200.8; EPA 6020A	Vanadium
ICP/MS	EPA 200.8; EPA 6020A	Zinc
CVAA	EPA 7470A	Mercury
UV/VIS	EPA 7196A	Hexavalent Chromium (Cr6+)
UV/VIS	EPA 9012B	Cyanide (Total)
IC	EPA 300; EPA 9056A	Bromide
IC	EPA 300; EPA 9056A	Chloride
IC	EPA 300; EPA 9056A	Fluoride
IC	EPA 300; EPA 9056A	Nitrate
IC	EPA 300; EPA 9056A	Nitrite
IC	EPA 300; EPA 9056A	Sulfate
IC	EPA 300; EPA 9056A	Total nitrate-nitrite
Automated Colorimetry	EPA 350.1	Ammonia
Automated Colorimetry	EPA 351.2	Total Kjeldahl Nitrogen
Automated Colorimetry	EPA 420.4	Total Phenolics
Automated Colorimetry	EPA 353.2	Nitrate
Automated Colorimetry	EPA 353.2	Nitrite
Automated Colorimetry	EPA 353.2	Nitrate+Nitrite
Manual Colorimetry	EPA 365.3	Orthophosphate
Manual Colorimetry	EPA 365.3	Total Phosphorus
Titrimetric	SM 2320B-11	Alkalinity, Total
Titrimetric	SM 4500-S2 F-11	Sulfide, Iodometric
Gravimetric Methods	EPA 1664A; EPA 9070A	Oil and Grease
Gravimetric Methods	SM 2540B-11	Total Residue (Total Solids)
Gravimetric Methods	SM 2540C-11	Filterable Residue (Total Dissolved Solids)

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
Gravimetric Methods	SM 2540D-11	Non-Filterable Residue (Total Suspended Solids)
Electrometric Methods	SM 4500H+B-11; EPA 9040C	Hydrogen Ion (Ph)
Electrometric Methods	EPA 120.1	Specific conductivity
Combustion	EPA 9060A	Total Organic Carbon
Ignitability	EPA 1010A	Flash Point
Waste Characterization	EPA Ch.7	Reactive Cyanide and Reactive Sulfide
Waste Characterization	EPA Section 7.3	Reactive Cyanide
Waste Characterization	EPA Section 7.3	Reactive Sulfide
<b>Preparation</b>	<b>Method</b>	<b>Type</b>
Organic Preparation	EPA 3510C	Separatory Funnel Liquid-Liquid Extraction
Organic Preparation	EPA 3511	Micro-extraction
Organic Preparation	EPA 3535A; EPA 3535A MOD	Solid Phase Extraction
Organic Preparation	EPA 8015C/D	Non-Halogenated Organics (Alcohols), direct injection
Organic Preparation	EPA 8151A	Chlorinated Herbicides, Liquid-Liquid Extraction
Organic Preparation	EPA 608; EPA 610; EPA 625	Separatory Funnel Liquid-Liquid Extraction
Volatile Organic Preparation	SW836 5030B	Closed System Purge and Trap
Volatile Organic Preparation	EPA 624	Closed System Purge and Trap
Volatile Organic Preparation	SM 6200B-11	Closed System Purge and Trap
Lachat MicroDistillation	EPA 9012B	Cyanide MicroDistillation; proprietary method
Inorganic Preparation	EPA 3010C	Metals Acid Digestion by Hotblock
Inorganic Preparation	EPA 7470A	CVAA Digestion by Hotblock
Organics Cleanup	EPA 3660B	Sulfur Cleanup
Organics Cleanup	EPA 3665A	Sulfuric Acid Cleanup

<b>Solid and Chemical Materials</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
GC/ECD	EPA 8011	1,2-Dibromoethane (EDB)
GC/ECD	EPA 8011	1,2-Dibromo-3-Chloropropane (DBCP)
GC/FID	EPA 8015C/D	Diesel range organics (DRO)
GC/FID	EPA 8015C/D	Oil Range Organics (ORO)
GC/FID	EPA 8015C/D	Gasoline range organics (GRO)
GC/FID	EPA 8015C/D	Ethanol
GC/FID	EPA 8015C/D	2-Ethoxyethanol
GC/FID	EPA 8015C/D	Isobutyl alcohol (2-Methyl-1-propanol)
GC/FID	EPA 8015C/D	Isopropyl alcohol (2-Propanol)
GC/FID	EPA 8015C/D	Methanol
GC/FID	EPA 8015C/D	n-Butyl alcohol
GC/FID	EPA 8015C/D	n-Propanol
GC/ECD	EPA 8081B	4,4' -DDD
GC/ECD	EPA 8081B	4,4' -DDE
GC/ECD	EPA 8081B	4,4' -DDT
GC/ECD	EPA 8081B	Aldrin
GC/ECD	EPA 8081B	alpha-BHC (alpha-Hexachlorocyclohexane)
GC/ECD	EPA 8081B	beta-BHC (beta-Hexachlorocyclohexane)
GC/ECD	EPA 8081B	delta-BHC
GC/ECD	EPA 8081B	gamma-BHC (Lindane gamma-Hexachlorocyclohexane)
GC/ECD	EPA 8081B	Chlordane (tech.)
GC/ECD	EPA 8081B	alpha-Chlordane
GC/ECD	EPA 8081B	gamma-Chlordane
GC/ECD	EPA 8081B	Dieldrin
GC/ECD	EPA 8081B	Endosulfan I
GC/ECD	EPA 8081B	Endosulfan II
GC/ECD	EPA 8081B	Endosulfan sulfate
GC/ECD	EPA 8081B	Endrin
GC/ECD	EPA 8081B	Endrin aldehyde
GC/ECD	EPA 8081B	Endrin ketone
GC/ECD	EPA 8081B	Heptachlor
GC/ECD	EPA 8081B	Heptachlor epoxide
GC/ECD	EPA 8081B	Methoxychlor
GC/ECD	EPA 8081B	Toxaphene (Chlorinated camphene)
GC/ECD	EPA 8082A	Aroclor-1016 (PCB-1016)
GC/ECD	EPA 8082A	Aroclor-1221 (PCB-1221)
GC/ECD	EPA 8082A	Aroclor-1232 (PCB-1232)
GC/ECD	EPA 8082A	Aroclor-1242 (PCB-1242)
GC/ECD	EPA 8082A	Aroclor-1248 (PCB-1248)
GC/ECD	EPA 8082A	Aroclor-1254 (PCB-1254)

<b>Solid and Chemical Materials</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
GC/ECD	EPA 8082A	Aroclor-1260 (PCB-1260)
GC/ECD	EPA 8082A	Aroclor-1262 (PCB-1262)
GC/ECD	EPA 8082A	Aroclor-1268 (PCB-1268)
GC/ECD	EPA 8082A	2,4'-diCB bz8
GC/ECD	EPA 8082A	2,2',5-trCB bz18
GC/ECD	EPA 8082A	2,4,4'-trCB bz28
GC/ECD	EPA 8082A	2,2',3,5'-teCB bz44
GC/ECD	EPA 8082A	2,2',4,5'-teCB bz49
GC/ECD	EPA 8082A	2,2',5,5'-teCB bz52
GC/ECD	EPA 8082A	2,3'4,4'-teCB bz66
GC/ECD	EPA 8082A	3,3',4,4'-teCB bz77
GC/ECD	EPA 8082A	3,4,4',5-teCB bz81
GC/ECD	EPA 8082A	2,2',3,4,5'-peCB bz87
GC/ECD	EPA 8082A	2,2',3,4',5-peCB bz90
GC/ECD	EPA 8082A	2,2',4,5,5'-peCB bz101
GC/ECD	EPA 8082A	2,3,3',4,4'-peCB bz105
GC/ECD	EPA 8082A	2,3',4,4',5-peCB bz118
GC/ECD	EPA 8082A	2',3,4,4',5-peCB bz123
GC/ECD	EPA 8082A	3,3',4,4',5-peCB bz126
GC/ECD	EPA 8082A	2,2',3,3',4,4'-hxCB bz128
GC/ECD	EPA 8082A	2,2',3,4,4',5'-hxCB bz138
GC/ECD	EPA 8082A	2,2',3,5,5',6-hxCB bz151
GC/ECD	EPA 8082A	2,2',4,4',5,5'-hxCB bz153
GC/ECD	EPA 8082A	2,3,3',4,4',5-hxCB bz156
GC/ECD	EPA 8082A	2,3,3',4,4',5'-hxCB bz157
GC/ECD	EPA 8082A	2,3',4,4',5,5'-hxCB bz167
GC/ECD	EPA 8082A	3,3',4,4',5,5'-hxCB bz169
GC/ECD	EPA 8082A	2,2',3,3',4,4',5-hpCB bz170
GC/ECD	EPA 8082A	2,2',3,4,4',5,5'-hpCB bz180
GC/ECD	EPA 8082A	2,2',3,4,4',5',6-hpCB bz183
GC/ECD	EPA 8082A	2,2',3,4,4',6,6'-hpCB bz184
GC/ECD	EPA 8082A	2,2',3,4',5,5',6-hpCB bz187
GC/ECD	EPA 8082A	2,3,3',4,4',5,5'-hpCB bz189
GC/ECD	EPA 8082A	2,2',3,3',4,4',5,6-ocCB bz195
GC/ECD	EPA 8082A	2,2',3,3',4,4',5,5',6-noCB bz206
GC/ECD	EPA 8082A	Decachlorobiphenyl bz209
GC/FPD	EPA 8141B	Azinphos-methyl (Guthion)
GC/FPD	EPA 8141B	Bolstar (Sulprofos)
GC/FPD	EPA 8141B	Carbophenothion
GC/FPD	EPA 8141B	Chlorpyrifos
GC/FPD	EPA 8141B	Coumaphos
GC/FPD	EPA 8141B	Demeton-o

<b>Solid and Chemical Materials</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
GC/FPD	EPA 8141B	Demeton-s
GC/FPD	EPA 8141B	Diazinon
GC/FPD	EPA 8141B	Dichlorovos (DDVP Dichlorvos)
GC/FPD	EPA 8141B	Dimethoate
GC/FPD	EPA 8141B	Disulfoton
GC/FPD	EPA 8141B	EPN
GC/FPD	EPA 8141B	Ethion
GC/FPD	EPA 8141B	Ethoprop
GC/FPD	EPA 8141B	Famphur
GC/FPD	EPA 8141B	Fensulfothion
GC/FPD	EPA 8141B	Fenthion
GC/FPD	EPA 8141B	Malathion
GC/FPD	EPA 8141B	Merphos
GC/FPD	EPA 8141B	Methyl parathion (Parathion methyl)
GC/FPD	EPA 8141B	Mevinphos
GC/FPD	EPA 8141B	Monocrotophos
GC/FPD	EPA 8141B	Naled
GC/FPD	EPA 8141B	Parathion ethyl
GC/FPD	EPA 8141B	Phorate
GC/FPD	EPA 8141B	Ronnel
GC/FPD	EPA 8141B	Stirofos
GC/FPD	EPA 8141B	Sulfotepp
GC/FPD	EPA 8141B	Tetraethyl pyrophosphate (TEPP)
GC/FPD	EPA 8141B	Thionazin (Zinophos)
GC/FPD	EPA 8141B	Tokuthion (Prothiophos)
GC/FPD	EPA 8141B	Trichloronate
GC/FPD	EPA 8141B	O,O,O-Triethyl phosphorothioate
GC/ECD	EPA 8151A	2,4,5-T
GC/ECD	EPA 8151A	2,4-D
GC/ECD	EPA 8151A	2,4-DB
GC/ECD	EPA 8151A	Dalapon
GC/ECD	EPA 8151A	Dicamba
GC/ECD	EPA 8151A	Dichloroprop (Dichlorprop)
GC/ECD	EPA 8151A	Dinoseb (2-sec-butyl-4,6-dinitrophenol DNBP)
GC/ECD	EPA 8151A	MCPA
GC/ECD	EPA 8151A	MCPP
GC/ECD	EPA 8151A	Pentachlorophenol
GC/ECD	EPA 8151A	Silvex (2,4,5-TP)
GC/FID	FL-PRO	Total Petroleum Hydrocarbons (TPH)
GC/FID	MA-VPH	Volatile petroleum range organics (VPH)
GC/FID	MA-EPH	Extractable petroleum range organics (EPH)

<b>Solid and Chemical Materials</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
GC/FID	IA-OA1	Gasoline range organics (GRO)
GC/FID	IA-OA2	Diesel range organics (DRO)
GC/FID	TN-GRO	Gasoline range organics (GRO)
GC/FID	TN-EPH	Extractable petroleum range organics (EPH)
GC/FID	AK-101	Gasoline range organics (GRO)
GC/FID	AK-102	Diesel range organics (DRO)
GC/FID	AK-103	Residual range organics (RRO)
GC/FID	OK-GRO	Gasoline range organics (GRO)
GC/FID	OK-DRO	Diesel range organics (DRO)
GC/FID	TX-1005	Total Petroleum Hydrocarbons (TPH)
GC/MS	EPA 8260B/C	1,1,1,2-Tetrachloroethane
GC/MS	EPA 8260B/C	1,1,1-Trichloroethane
GC/MS	EPA 8260B/C	1,1,2,2-Tetrachloroethane
GC/MS	EPA 8260B/C	1,1,2-Trichloroethane
GC/MS	EPA 8260B/C	1,1-Dichloroethane
GC/MS	EPA 8260B/C	1,1-Dichloroethylene
GC/MS	EPA 8260B/C	1,1-Dichloropropene
GC/MS	EPA 8260B/C	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)
GC/MS	EPA 8260B/C	1,2,3-Trichlorobenzene
GC/MS	EPA 8260B/C	1,2,3-Trichloropropane
GC/MS	EPA 8260B/C	1,2,4-Trichlorobenzene
GC/MS	EPA 8260B/C	1,2,4-Trimethylbenzene
GC/MS	EPA 8260B/C	1,2-Dibromo-3-chloropropane (DBCP)
GC/MS	EPA 8260B/C	1,2-Dibromoethane (EDB Ethylene dibromide)
GC/MS	EPA 8260B/C	1,2-Dichlorobenzene (o-Dichlorobenzene)
GC/MS	EPA 8260B/C	1,2-Dichloroethane
GC/MS	EPA 8260B/C	1,2-Dichloropropane
GC/MS	EPA 8260B/C	1,2-Dichlorotrifluoroethane (Freon 123)
GC/MS	EPA 8260B/C	1,3,5-Trimethylbenzene
GC/MS	EPA 8260B/C	1,3-Dichlorobenzene (m-Dichlorobenzene)
GC/MS	EPA 8260B/C	1,3-Dichloropropane
GC/MS	EPA 8260B/C	1,4-Dichlorobenzene (p-Dichlorobenzene)
GC/MS	EPA 8260B/C	1-Chlorohexane
GC/MS	EPA 8260B/C	2,2-Dichloropropane
GC/MS	EPA 8260B/C	2-Butanone (Methyl ethyl ketone MEK)
GC/MS	EPA 8260B/C	2-Chloroethyl vinyl ether
GC/MS	EPA 8260B/C	2-Chlorotoluene
GC/MS	EPA 8260B/C	2-Hexanone
GC/MS	EPA 8260B/C	2-Nitropropane
GC/MS	EPA 8260B/C	4-Chlorotoluene
GC/MS	EPA 8260B/C	4-Methyl-2-pentanone (MBK)

<b>Solid and Chemical Materials</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
GC/MS	EPA 8260B/C	Acetone
GC/MS	EPA 8260B/C	Acetonitrile
GC/MS	EPA 8260B/C	Acrolein (Propenal)
GC/MS	EPA 8260B/C	Acrylonitrile
GC/MS	EPA 8260B/C	Allyl chloride (3-Chloropropene)
GC/MS	EPA 8260B/C	Benzene
GC/MS	EPA 8260B/C	Benzyl Chloride
GC/MS	EPA 8260B/C	Bromobenzene
GC/MS	EPA 8260B/C	Bromochloromethane
GC/MS	EPA 8260B/C	Bromodichloromethane
GC/MS	EPA 8260B/C	Bromoform
GC/MS	EPA 8260B/C	n-Butylbenzene
GC/MS	EPA 8260B/C	sec-Butylbenzene
GC/MS	EPA 8260B/C	tert-Butylbenzene
GC/MS	EPA 8260B/C	Carbon disulfide
GC/MS	EPA 8260B/C	Carbon tetrachloride
GC/MS	EPA 8260B/C	Chlorobenzene
GC/MS	EPA 8260B/C	Chloroethane
GC/MS	EPA 8260B/C	Chloroform
GC/MS	EPA 8260B/C	Chloroprene
GC/MS	EPA 8260B/C	Cyclohexane
GC/MS	EPA 8260B/C	Cyclohexanone
GC/MS	EPA 8260B/C	cis-1,2-Dichloroethylene
GC/MS	EPA 8260B/C	trans-1,2-Dichloroethylene
GC/MS	EPA 8260B/C	cis-1,3-Dichloropropene
GC/MS	EPA 8260B/C	trans-1,3-Dichloropropylene
GC/MS	EPA 8260B/C	cis-1,4-Dichloro-2-butene
GC/MS	EPA 8260B/C	trans-1,4-Dichloro-2-butene
GC/MS	EPA 8260B/C	Di-isopropylether (DIPE)
GC/MS	EPA 8260B/C	Dibromochloromethane
GC/MS	EPA 8260B/C	Dibromomethane (Methylene Bromide)
GC/MS	EPA 8260B/C	Dichlorodifluoromethane
GC/MS	EPA 8260B/C	Diethyl ether
GC/MS	EPA 8260B/C; EPA 8260B/C SIM	p-Dioxane (1,4-Dioxane)
GC/MS	EPA 8260B/C	Ethanol (Ethyl Alcohol)
GC/MS	EPA 8260B/C	Ethyl acetate
GC/MS	EPA 8260B/C	Ethyl methacrylate
GC/MS	EPA 8260B/C	Ethyl tert-butyl alcohol (ETBA)
GC/MS	EPA 8260B/C	Ethyl tert-butyl ether (ETBE)
GC/MS	EPA 8260B/C	Ethylbenzene
GC/MS	EPA 8260B/C	Ethylene Oxide

<b>Solid and Chemical Materials</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
GC/MS	EPA 8260B/C	Hexachlorobutadiene
GC/MS	EPA 8260B/C	Hexane
GC/MS	EPA 8260B/C	Iodomethane (Methyl iodide)
GC/MS	EPA 8260B/C	Isobutyl alcohol (2-Methyl-1-propanol)
GC/MS	EPA 8260B/C	p-Isopropyltoluene
GC/MS	EPA 8260B/C	Isopropylbenzene
GC/MS	EPA 8260B/C	Methacrylonitrile
GC/MS	EPA 8260B/C	Methyl Acetate
GC/MS	EPA 8260B/C	Methyl bromide (Bromomethane)
GC/MS	EPA 8260B/C	Methyl chloride (Chloromethane)
GC/MS	EPA 8260B/C	Methylcyclohexane
GC/MS	EPA 8260B/C	Methyl methacrylate
GC/MS	EPA 8260B/C	Methyl tert-butyl ether (MTBE)
GC/MS	EPA 8260B/C	Methylene chloride
GC/MS	EPA 8260B/C	Naphthalene
GC/MS	EPA 8260B/C	Pentachloroethane
GC/MS	EPA 8260B/C	Propionitrile (Ethyl cyanide)
GC/MS	EPA 8260B/C	n-Propylbenzene
GC/MS	EPA 8260B/C	Styrene
GC/MS	EPA 8260B/C	tert-Amyl alcohol (TAA)
GC/MS	EPA 8260B/C	tert-Amyl methyl ether (TAME)
GC/MS	EPA 8260B/C	tert-Butyl alcohol (TBA)
GC/MS	EPA 8260B/C	tert-Butyl formate (TBF)
GC/MS	EPA 8260B/C	Tetrachloroethylene (Perchloroethylene)
GC/MS	EPA 8260B/C	Tetrahydrofuran
GC/MS	EPA 8260B/C	Toluene
GC/MS	EPA 8260B/C	Trichloroethene (Trichloroethylene)
GC/MS	EPA 8260B/C	Trichlorofluoromethane
GC/MS	EPA 8260B/C	Vinyl acetate
GC/MS	EPA 8260B/C	Vinyl chloride
GC/MS	EPA 8260B/C	Xylene (total)
GC/MS	EPA 8260B/C	m,p-Xylene
GC/MS	EPA 8260B/C	o-Xylene
GC/MS	EPA 8270D	1,2,4,5-Tetrachlorobenzene
GC/MS	EPA 8270D	1,2,4-Trichlorobenzene
GC/MS	EPA 8270D	1,2-Dichlorobenzene (o-Dichlorobenzene)
GC/MS	EPA 8270D	1,2-Diphenylhydrazine
GC/MS	EPA 8270D	1,3,5-Trinitrobenzene (1,3,5-TNB)
GC/MS	EPA 8270D	1,3-Dichlorobenzene (m-Dichlorobenzene)
GC/MS	EPA 8270D	1,3-Dinitrobenzene (1,3-DNB)
GC/MS	EPA 8270D	1,4-Dichlorobenzene (p-Dichlorobenzene)

<b>Solid and Chemical Materials</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
GC/MS	EPA 8270D	1,4-Dithiane
GC/MS	EPA 8270D	1,4-Oxathiane
GC/MS	EPA 8270D	1,4-Naphthoquinone
GC/MS	EPA 8270D	1,4-Phenylenediamine
GC/MS	EPA 8270D	1-Chloronaphthalene
GC/MS	EPA 8270D; EPA 8270D SIM	1-Methylnaphthalene
GC/MS	EPA 8270D	1-Naphthylamine
GC/MS	EPA 8270D	2,3,4,6-Tetrachlorophenol
GC/MS	EPA 8270D	2,4,5-Trichlorophenol
GC/MS	EPA 8270D	2,4,6-Trichlorophenol
GC/MS	EPA 8270D	2,4-Dichlorophenol
GC/MS	EPA 8270D	2,4-Dimethylphenol
GC/MS	EPA 8270D	2,4-Dinitrophenol
GC/MS	EPA 8270D	2,4-Dinitrotoluene (2,4-DNT)
GC/MS	EPA 8270D	2,6-Dichlorophenol
GC/MS	EPA 8270D	2,6-Dinitrotoluene (2,6-DNT)
GC/MS	EPA 8270D	2-Acetylaminofluorene
GC/MS	EPA 8270D	2-Chloronaphthalene
GC/MS	EPA 8270D	2-Chlorophenol
GC/MS	EPA 8270D	2-Methyl-4,6-dinitrophenol (4,6-Dinitro-o-cresol)
GC/MS	EPA 8270D; EPA 8270D SIM	2-Methylnaphthalene
GC/MS	EPA 8270D	2-Methylphenol (o-Cresol)
GC/MS	EPA 8270D	2-Naphthylamine
GC/MS	EPA 8270D	2-Nitroaniline
GC/MS	EPA 8270D	2-Nitrophenol
GC/MS	EPA 8270D	2-Picoline (2-Methylpyridine)
GC/MS	EPA 8270D	3,3'-Dichlorobenzidine
GC/MS	EPA 8270D	3,3'-Dimethylbenzidine
GC/MS	EPA 8270D	3-Methylcholanthrene
GC/MS	EPA 8270D	3&4-Methylphenol (m,p-Cresol)
GC/MS	EPA 8270D	3-Nitroaniline
GC/MS	EPA 8270D	4-Aminobiphenyl
GC/MS	EPA 8270D	4-Bromophenyl phenyl ether
GC/MS	EPA 8270D	4-Chloro-3-methylphenol
GC/MS	EPA 8270D	4-Chloroaniline
GC/MS	EPA 8270D	4-Chlorophenyl phenylether
GC/MS	EPA 8270D	4-Dimethyl aminoazobenzene
GC/MS	EPA 8270D	4-Nitroaniline
GC/MS	EPA 8270D	4-Nitrophenol
GC/MS	EPA 8270D	4,4'-methylene-bis(2-chloroaniline)
GC/MS	EPA 8270D	5-Nitro-o-toluidine

<b>Solid Chemical Materials</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
GC/MS	EPA 8270D	7,12-Dimethylbenz(a) anthracene
GC/MS	EPA 8270D; EPA 8270D SIM	Acenaphthene
GC/MS	EPA 8270D; EPA 8270D SIM	Acenaphthylene
GC/MS	EPA 8270D	Acetophenone
GC/MS	EPA 8270D	Aniline
GC/MS	EPA 8270D	Anilazine
GC/MS	EPA 8270D; EPA 8270D SIM	Anthracene
GC/MS	EPA 8270D	Aramite
GC/MS	EPA 8270D	Atrazine
GC/MS	EPA 8270D	Benzaldehyde
GC/MS	EPA 8270D	Benzidine
GC/MS	EPA 8270D; EPA 8270D SIM	Benzo(a)anthracene
GC/MS	EPA 8270D; EPA 8270D SIM	Benzo(a)pyrene
GC/MS	EPA 8270D; EPA 8270D SIM	Benzo(b)fluoranthene
GC/MS	EPA 8270D; EPA 8270D SIM	Benzo(g,h,i)perylene
GC/MS	EPA 8270D; EPA 8270D SIM	Benzo(k)fluoranthene
GC/MS	EPA 8270D	Benzoic acid
GC/MS	EPA 8270D	Benzyl alcohol
GC/MS	EPA 8270D	Biphenyl (1,1'-Biphenyl)
GC/MS	EPA 8270D	bis(2-Chloroethoxy)methane
GC/MS	EPA 8270D	bis(2-Chloroethyl) ether
GC/MS	EPA 8270D	bis(2-Chloroisopropyl) ether (2,2'-Oxybis(1-chloropropane))
GC/MS	EPA 8270D	bis(2-Ethylhexyl) phthalate (DEHP)
GC/MS	EPA 8270D	Butyl benzyl phthalate
GC/MS	EPA 8270D	Carbazole
GC/MS	EPA 8270D	Caprolactam
GC/MS	EPA 8270D	Chlorobenzilate
GC/MS	EPA 8270D; EPA 8270D SIM	Chrysene
GC/MS	EPA 8270D	Diallate
GC/MS	EPA 8270D	Di-n-butyl phthalate
GC/MS	EPA 8270D	Di-n-octyl phthalate
GC/MS	EPA 8270D; EPA 8270D SIM	Dibenz(a,h)anthracene
GC/MS	EPA 8270D	Dibenz(a,j)acridine
GC/MS	EPA 8270D	Dibenzofuran
GC/MS	EPA 8270D	Diethyl phthalate
GC/MS	EPA 8270D	Dimethyl phthalate
GC/MS	EPA 8270D	a,a-Dimethylphenethylamine
GC/MS	EPA 8270D	Diphenyl Ether
GC/MS	EPA 8270D	p-Dioxane (1,4-Dioxane)
GC/MS	EPA 8270D	Ethyl methanesulfonate
GC/MS	EPA 8270D; EPA 8270D SIM	Fluoranthene

<b>Solid Chemical Materials</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
GC/MS	EPA 8270D; EPA 8270D SIM	Fluorene
GC/MS	EPA 8270D	Hexachlorobenzene
GC/MS	EPA 8270D	Hexachlorobutadiene
GC/MS	EPA 8270D	Hexachlorocyclopentadiene
GC/MS	EPA 8270D	Hexachloroethane
GC/MS	EPA 8270D	Hexachlorophene
GC/MS	EPA 8270D	Hexachloropropene
GC/MS	EPA 8270D; EPA 8270D SIM	Indeno(1,2,3-cd)pyrene
GC/MS	EPA 8270D	Isodrin
GC/MS	EPA 8270D	Isophorone
GC/MS	EPA 8270D	Isosafrole
GC/MS	EPA 8270D	Kepone
GC/MS	EPA 8270D	Methapyrilene
GC/MS	EPA 8270D	Methyl methanesulfonate
GC/MS	EPA 8270D; EPA 8270D SIM	Naphthalene
GC/MS	EPA 8270D	Nicotine
GC/MS	EPA 8270D	Nitrobenzene
GC/MS	EPA 8270D	Nitroquinoline-1-oxide
GC/MS	EPA 8270D	n-Nitroso-di-n-butylamine
GC/MS	EPA 8270D	n-Nitrosodi-n-propylamine
GC/MS	EPA 8270D	n-Nitrosodiethylamine
GC/MS	EPA 8270D	n-Nitrosodimethylamine
GC/MS	EPA 8270D	n-Nitrosodiphenylamine
GC/MS	EPA 8270D	n-Nitrosodiphenylamine/Diphenylamine (analyte pair)
GC/MS	EPA 8270D	n-Nitrosomethylethylamine
GC/MS	EPA 8270D	n-Nitrosomorpholine
GC/MS	EPA 8270D	n-Nitrosopiperidine
GC/MS	EPA 8270D	n-Nitrosopyrrolidine
GC/MS	EPA 8270D	Pentachlorobenzene
GC/MS	EPA 8270D	Pentachloroethane
GC/MS	EPA 8270D	Pentachloronitrobenzene
GC/MS	EPA 8270D; EPA 8270D SIM	Pentachlorophenol
GC/MS	EPA 8270D	Phenacetin
GC/MS	EPA 8270D; EPA 8270D SIM	Phenanthrene
GC/MS	EPA 8270D	Phenol
GC/MS	EPA 8270D	Pronamide (Kerb)
GC/MS	EPA 8270D	Propazine
GC/MS	EPA 8270D; EPA 8270D SIM	Pyrene
GC/MS	EPA 8270D	Pyridine
GC/MS	EPA 8270D	Resorcinol
GC/MS	EPA 8270D	Safrole

<b>Solid Chemical Materials</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
GC/MS	EPA 8270D	Simazine
GC/MS	EPA 8270D	o-Toluidine
GC/MS	EPA 8270D	Dimethoate
GC/MS	EPA 8270D	Disulfoton
GC/MS	EPA 8270D	Famphur
GC/MS	EPA 8270D	Methyl parathion (Parathion methyl)
GC/MS	EPA 8270D	Parathion ethyl
GC/MS	EPA 8270D	Phorate
GC/MS	EPA 8270D	Sulfotepp
GC/MS	EPA 8270D	Thionazin (Zinophos)
GC/MS	EPA 8270D	O,O,O-Triethyl phosphorothioate
HPLC	EPA 8310	1-Methylnaphthalene
HPLC	EPA 8310	2-Methylnaphthalene
HPLC	EPA 8310	Acenaphthene
HPLC	EPA 8310	Acenaphthylene
HPLC	EPA 8310	Anthracene
HPLC	EPA 8310	Benzo(a)anthracene
HPLC	EPA 8310	Benzo(a)pyrene
HPLC	EPA 8310	Benzo(b)fluoranthene
HPLC	EPA 8310	Benzo(g h i)perylene
HPLC	EPA 8310	Benzo(k)fluoranthene
HPLC	EPA 8310	Chrysene
HPLC	EPA 8310	Dibenz(a h)anthracene
HPLC	EPA 8310	Fluoranthene
HPLC	EPA 8310	Fluorene
HPLC	EPA 8310	Indeno(1,2,3-cd)pyrene
HPLC	EPA 8310	Naphthalene
HPLC	EPA 8310	Phenanthrene
HPLC	EPA 8310	Pyrene
HPLC	EPA 8330A/B	1,3,5-Trinitrobenzene (1,3,5-TNB)
HPLC	EPA 8330A/B	1,3-Dinitrobenzene (1,3-DNB)
HPLC	EPA 8330A/B	2,4,6-Trinitrotoluene (2,4,6-TNT)
HPLC	EPA 8330A/B	2,4-Dinitrotoluene (2,4-DNT)
HPLC	EPA 8330A/B	2,6-Dinitrotoluene (2,6-DNT)
HPLC	EPA 8330A/B	2-Amino-4,6-dinitrotoluene (2-am-dnt)
HPLC	EPA 8330A/B	2-Nitrotoluene
HPLC	EPA 8330A/B	3,5-Dinitroaniline
HPLC	EPA 8330A/B	3-Nitrotoluene
HPLC	EPA 8330A/B	4-Amino-2,6-dinitrotoluene (4-am-dnt)
HPLC	EPA 8330A/B	4-Nitrotoluene
HPLC	EPA 8330A/B	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)

<b>Solid Chemical Materials</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
HPLC	EPA 8330A/B	Nitrobenzene
HPLC	EPA 8330A/B; EPA 8332	Nitroglycerin
HPLC	EPA 8330A/B	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)
HPLC	EPA 8330A/B	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)
HPLC	EPA 8330A/B; EPA 8332	Pentaerythritoltetranitrate (PETN)
HPLC	EPA 8330A	2,2',6,6'-Tetranitro-4,4'-azoxytoluene
HPLC	EPA 8330A/B	2-amino-6-Nitrotoluene
HPLC	EPA 8330A/B	4-amino-2-Nitrotoluene
HPLC	EPA 8330A/B	2-amino-4-Nitrotoluene
HPLC	EPA 8330A/B	2,4-diamino-6-Nitrotoluene
HPLC	EPA 8330A/B	2,6-diamino-4-Nitrotoluene
HPLC	EPA 8330A/B	DNX
HPLC	EPA 8330A/B	MNX
HPLC	EPA 8330A/B	TNX
LC/MS/MS	EPA 6850	Perchlorate
LC/MS/MS	EPA 537 MOD	Perfluorobutanoic Acid
LC/MS/MS	EPA 537 MOD	Perfluoropentanoic Acid
LC/MS/MS	EPA 537 MOD	Perfluorohexanoic Acid
LC/MS/MS	EPA 537 MOD	Perfluoroheptanoic Acid
LC/MS/MS	EPA 537 MOD	Perfluorooctanoic Acid
LC/MS/MS	EPA 537 MOD	Perfluorononanoic Acid
LC/MS/MS	EPA 537 MOD	Perfluorodecanoic Acid
LC/MS/MS	EPA 537 MOD	Perfluoroundecanoic Acid
LC/MS/MS	EPA 537 MOD	Perfluorododecanoic Acid
LC/MS/MS	EPA 537 MOD	Perfluorotridecanoic Acid
LC/MS/MS	EPA 537 MOD	Perfluorotridecanoic Acid
LC/MS/MS	EPA 537 MOD	Perfluorotetradecanoic Acid
LC/MS/MS	EPA 537 MOD	Perfluorobutanesulfonic Acid
LC/MS/MS	EPA 537 MOD	Perfluorohexanesulfonic Acid
LC/MS/MS	EPA 537 MOD	Perfluorooctanesulfonic Acid
LC/MS/MS	EPA 537 MOD	Perfluorodecanesulfonic Acid
ICP	EPA 6010C	Aluminum
ICP	EPA 6010C	Antimony
ICP	EPA 6010C	Arsenic
ICP	EPA 6010C	Barium
ICP	EPA 6010C	Beryllium
ICP	EPA 6010C	Cadmium
ICP	EPA 6010C	Calcium
ICP	EPA 6010C	Chromium
ICP	EPA 6010C	Cobalt
ICP	EPA 6010C	Copper

<b>Solid Chemical Materials</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
ICP	EPA 6010C	Iron
ICP	EPA 6010C	Lead
ICP	EPA 6010C	Magnesium
ICP	EPA 6010C	Manganese
ICP	EPA 6010C	Molybdenum
ICP	EPA 6010C	Nickel
ICP	EPA 6010C	Potassium
ICP	EPA 6010C	Selenium
ICP	EPA 6010C	Silver
ICP	EPA 6010C	Sodium
ICP	EPA 6010C	Strontium
ICP	EPA 6010C	Thallium
ICP	EPA 6010C	Tin
ICP	EPA 6010C	Titanium
ICP	EPA 6010C	Vanadium
ICP	EPA 6010C	Zinc
ICP/MS	EPA 6020A	Aluminum
ICP/MS	EPA 6020A	Antimony
ICP/MS	EPA 6020A	Arsenic
ICP/MS	EPA 6020A	Barium
ICP/MS	EPA 6020A	Beryllium
ICP/MS	EPA 6020A	Cadmium
ICP/MS	EPA 6020A	Calcium
ICP/MS	EPA 6020A	Chromium
ICP/MS	EPA 6020A	Cobalt
ICP/MS	EPA 6020A	Copper
ICP/MS	EPA 6020A	Iron
ICP/MS	EPA 6020A	Lead
ICP/MS	EPA 6020A	Magnesium
ICP/MS	EPA 6020A	Manganese
ICP/MS	EPA 6020A	Molybdenum
ICP/MS	EPA 6020A	Nickel
ICP/MS	EPA 6020A	Potassium
ICP/MS	EPA 6020A	Selenium
ICP/MS	EPA 6020A	Silver
ICP/MS	EPA 6020A	Sodium
ICP/MS	EPA 6020A	Strontium
ICP/MS	EPA 6020A	Thallium
ICP/MS	EPA 6020A	Tin
ICP/MS	EPA 6020A	Titanium
ICP/MS	EPA 6020A	Vanadium

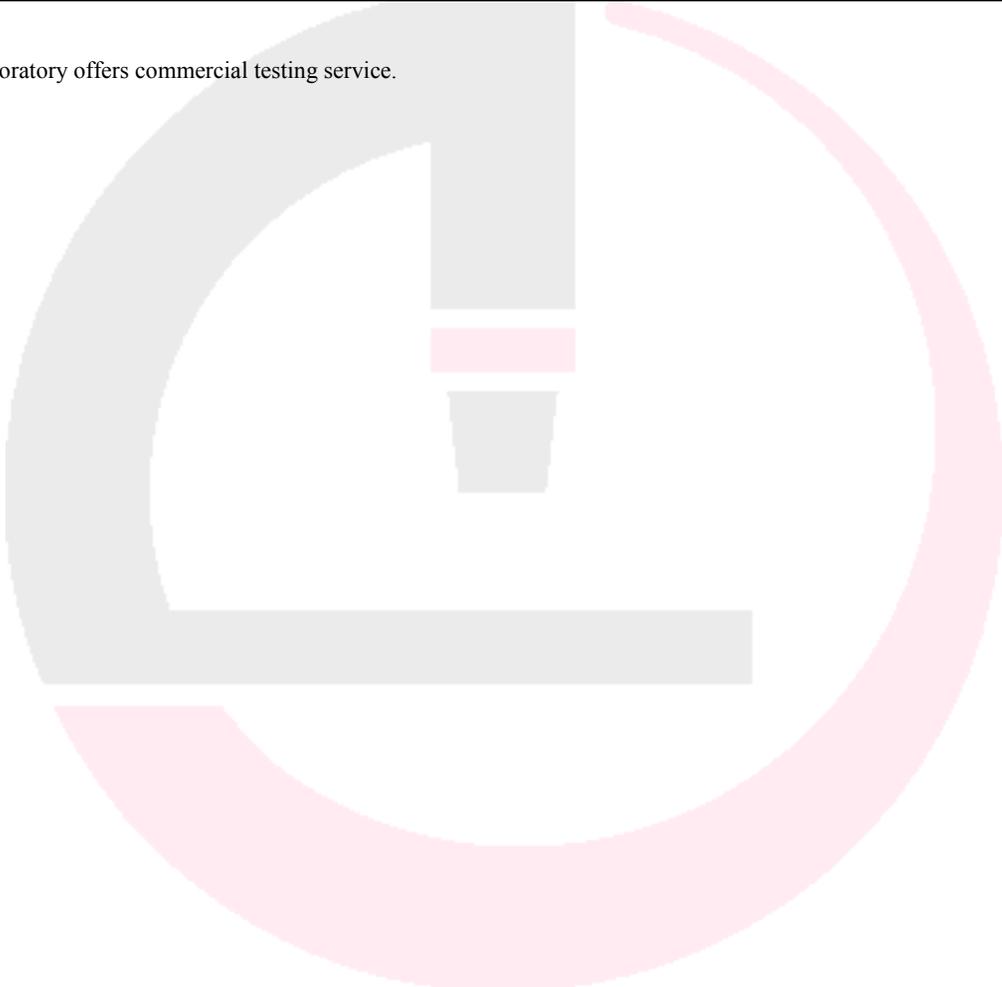
<b>Solid Chemical Materials</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
ICP/MS	EPA 6020A	Zinc
CVAA	EPA 7471B	Mercury
UV/VIS	EPA 7196A	Hexavalent Chromium (Cr6+)
UV/VIS	EPA 9012B	Cyanide (Total)
IC	EPA 9056A	Bromide
IC	EPA 9056A	Chloride
IC	EPA 9056A	Fluoride
IC	EPA 9056A	Nitrate
IC	EPA 9056A	Nitrite
IC	EPA 9056A	Sulfate
IC	EPA 9056A	Total nitrate-nitrite
Gravimetric Methods	SM 2540G	% solids
Gravimetric Methods	EPA 9071B	Oil and Grease
Electrometric Methods	EPA 9045D	Hydrogen Ion (pH)
Combustion	EPA 9060A	Total Organic Carbon
Ignitability	EPA 1010A	Flash Point
Waste Characterization	EPA Ch.7	Reactive Cyanide and Reactive Sulfide
Waste Characterization	EPA Section 7.3	Reactive Cyanide
Waste Characterization	EPA Section 7.3	Reactive Sulfide
<b>Preparation</b>	<b>Method</b>	<b>Type</b>
Organics Preparation	EPA 3510C	Separatory Funnel Liquid-Liquid Extraction; Leachates
TCLP Preparation	EPA 1311	Toxicity Characteristic Leaching Procedure
SPLP Preparation	EPA 1312	Synthetic Precipitation Leaching Procedure
Organics Preparation	EPA 8011	Microextraction
Organics Preparation	EPA 3546	Microwave Extraction
Organics Preparation	EPA 3550C	Ultrasonic Extraction
Organics Preparation	EPA 3580A	Waste Dilution for Extractable Organics
Organics Preparation	EPA 8330A; EPA 8332	Ultrasonic Extraction
Organics Preparation	EPA 8330B	Shaker Table Extraction
Volatile Organics Preparation	EPA 3585	Waste Dilution for Volatile Organics
Volatile Organics Preparation	EPA 5030A	Closed System Purge and Trap; Bulk Soils
Volatile Organics Preparation	EPA 5030B	Closed System Purge and Trap; Leachates and Methanol Extracts
Volatile Organics Preparation	EPA 5035; EPA 5035A	Closed System Purge and Trap
Organics Cleanup	EPA 3660B	Sulfur Cleanup
Organics Cleanup	EPA 3665A	Sulfuric Acid Cleanup

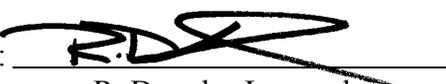


<b>Solid Chemical Materials</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
Lachat MicroDistillation	EPA 9012B	Cyanide MicroDistillation; proprietary method
Inorganic Preparation	EPA 3010C	Metals Acid Digestion by Hotblock; Leachates
Inorganic Preparation	EPA 3050B	Metals Acid Digestion by Hotblock
Inorganic Preparation	EPA 3060A	Alkaline Digestion, Cr6+
Inorganic Preparation	EPA 7470A	CVAA Digestion by Hotblock; Leachates
Inorganic Preparation	EPA 7471B	CVAA Digestion by Hotblock

Notes:

- 1) This laboratory offers commercial testing service.



Approved by:   
R. Douglas Leonard  
Chief Technical Officer

Date: January 22, 2015

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**APPENDIX E**  
**ACCIDENT PREVENTION PLAN**

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**DEPARTMENT OF THE NAVY  
NAVAL FACILITIES ENGINEERING COMMAND, MID-ATLANTIC  
REMEDIAL ACTION CONTRACT (RAC)  
CONTRACT NO. N62470-13-D-8007  
CONTRACT TASK ORDER NO. WE36**

**FINAL  
ACCIDENT PREVENTION PLAN  
REMOVAL ACTION AT AOC 2  
NAVAL WEAPONS STATION, YORKTOWN – CHEATHAM ANNEX,  
WILLIAMSBURG, VIRGINIA**

**December 2015**

*Prepared for*



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<u>Revision</u>	<u>Date</u>	<u>Prepared by</u>	<u>Approved by</u>	<u>Pages Affected</u>
0	12/3/15	J. Peters	M. Pisarcik	All

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## ACRONYMS AND ABBREVIATIONS

ACGIH	American Conference of Governmental Industrial Hygienists
AED	automatic external defibrillator
AHA	Activity Hazard Analysis
ANSI	American National Standards Institute
AOC	Area of Concern
APP	Accident Prevention Plan
Area 2	AOC 2 Area 2
ASTM	American Society for Testing and Materials
bgs	below ground surface
BLS	Bureau of Labor Statistics
CAX	Cheatham Annex
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CIRS	Contractor Incident Reporting System
COPC	chemical of potential concern
COR	Contracting Officer's Representative
CM	Construction Manager
CP	Competent Person
CPR	cardiopulmonary resuscitation
CSIR	Contractor's Significant Incident Report
CSP	Certified Safety Professional
DCN	Design Change Notice
DDT	dichlorodiphenyltrichloroethane
DFOW	Definable Feature of Work
DOL	Department of Labor
DOT	Department of Transportation
EC	Emergency Coordinator
EE/CA	Engineering Evaluation/Cost Analysis
EHS	Environmental Health and Safety
EM	Engineer Manual
EZ	exclusion zone
°F	degrees Fahrenheit
FCR	Field Change Request
FEAD	Facilities Engineering and Acquisition Division
ft <sup>2</sup>	square feet
GDA	Government Designated Authority
GFCI	ground-fault circuit interrupter
HAZCOM	hazard communication
HAZWOPER	Hazardous Waste Operations and Emergency Response
HTRW	Hazardous, Toxic, Radioactive Waste

IV	intravenous
KO	Contracting Officer
LHE	load handling equipment
mg/kg	milligrams per kilogram
MSDS	Material Safety Data Sheet
NEC	National Electrical Code
NRC	National Response Center
NTR	Navy Technical Representative
NRTL	Nationally Recognized Testing Laboratory
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
PDI	Preliminary Design Investigation
PEL	permissible exposure limit
PM	Project Manager
PPE	personal protective equipment
PSLP	Penniman Shell Loading Plant
QC	quality control
QP	Qualified Person
RA	Removal Action
RAC	Risk Assessment Code
ROD	Record of Decision
RPM	Remedial Project Manager
SDS	Safety Data Sheets
SHM	Safety and Health Manager
SLP	standard pre-lift plan
SOH	Safety and Occupational Health
SS	Site Superintendent
SSHO	Site Safety and Health Officer
SZ	support zone
TtEC	Tetra Tech EC, Inc.
TLV	Threshold Limit Value
UL	Underwriter's Laboratory
USACE	U.S. Army Corps of Engineers
WPNSTA	Weapons Station
ZIP	Zero Incident Performance

## 1.0 SIGNATURE SHEET

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## **2.0 BACKGROUND INFORMATION**

### **2.1 Contractor**

Contractor: Tetra Tech EC, Inc.

### **2.2 Contract Number**

Contract Number: N62473-13-D-8007 Task Order WE36.

### **2.3 Project Name**

Removal Action (RA) at Area of Concern (AOC) 2, Naval Weapons (NVLWPN) Station, Yorktown, Cheatham Annex (CAX), in Williamsburg, Virginia.

### **2.4 Description and Site History**

CAX consists of approximately 2,300 acres of land on the York-James Peninsula, northwest of WPNSTA Yorktown. The facility is divided into two separate parcels with the larger parcel situated along the banks of the York River (Figure 2-1). Almost all of the activities at CAX (administration, training, maintenance, support, and housing) take place in the larger parcel. The smaller parcel is used mainly as a watershed protection area. CAX is located on the site of the former Penniman Shell Loading Plant (PSLP), a large powder and shell loading facility operated by the DuPont Company during World War I. The PSLP closed in 1918 and was dismantled between 1918 and 1923. Between 1923 and 1943, the property was used for farming or remained idle. CAX was commissioned in 1943 as a satellite unit of the Naval Supply Depot to provide bulk storage facilities and to serve as an assembly and overseas shipping point during World War II. In 1987, CAX was designated the Hampton Roads Navy Recreational Complex. In 1998, control of CAX was transferred from Fleet and Industrial Supply Center to WPNSTA Yorktown. The current mission of CAX includes supplying Atlantic Fleet ships and providing recreational opportunities to military and civilian Department of Defense personnel.

AOC 2 is a less-than-1-acre wooded site located to the north of Garrison Road, along the southern perimeter of CAX (Figure 2-1). Historical information indicates that AOC 2 was an unlined, non-permitted disposal area with unknown dates of debris disposal. AOC 2 was identified during site visits by the Navy, United States Environmental Protection Agency, Virginia Department of Environmental Quality, and Baker Environmental, Inc. (Baker) in late 1997 and early 1998 and consists of several rows of concrete foundation piers that at one time supported a shipping house associated with the former DuPont Company PSLP facility. The majority of structures associated with the PSLP facility were demolished between 1918 and 1925. Grass-covered lanes leading to the site area are likely remnants of former railroad lines that have been removed. Partially buried glass intravenous (IV) bottles (of which the majority were labeled “dextrose”) and unlabeled, empty, 55-gallon drums, respirator cartridges, deer carcasses, and surplus military clothing were discovered in the area. Several mounds also present in the area were suspected to contain buried debris (Baker, 2001).

The topography of AOC 2 is predominantly flat. No wetlands or other surface water bodies are located at AOC 2, and there are no nearby water bodies down-gradient of the site. Surface runoff at the site is anticipated to pond and infiltrate into the subsurface or evaporate. In general, the native soil is predominantly composed of clay and silt at AOC 2.

Based on the types of debris observed during test trenching activities performed during prior investigations (summarized in the Work Plan), AOC 2 was separated into three areas:

- Areas 1a and 1b contain dextrose IV bottles
- AOC 2 Area 2 (Area 2) contains unused respirator cartridges and empty 55-gallon drums
- Area 3 contains surplus military clothing.

The CAX Partnering Team agreed the debris in Areas 1a, 1b, and 3 (dextrose IV bottles and military clothing) is inert and not a source regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); therefore, it does not require removal.

The Area 2 removal action area is approximately 4,100 square feet (ft<sup>2</sup>) in size and was identified during previous investigations as posing potential human health and ecological risks from exposure to debris (respirator cartridges, empty 55-gallon drums) and site soil chemicals of potential concern (COPCs) - (Aroclor-1260, arsenic, chromium, 4-4'-dichlorodiphenyltrichloroethane (DDT), [4,4-DDT] and mercury) in surface and subsurface soil. The total footprint area and volume of Area 2 to be addressed by this removal action are 3,700 ft<sup>2</sup> and 1,304 cubic yards, respectively. The total volume includes additional excavation for sloping of the removal areas for excavations deeper than 5 feet below ground surface (bgs). The assumed excavation depths and total footprint areas for Area 2 are 1,400 ft<sup>2</sup> to a depth of 9 feet bgs and 2,300 ft<sup>2</sup> to a depth of 6 feet bgs.

## **2.5 Major Phases of Work**

An Engineering Evaluation/Cost Analysis (EE/CA) for Area of Concern 2 – Dextrose Dump has been prepared (CH2MHill 2015, *currently in Draft*) and an Action Memorandum will be prepared for the selected remedy of excavation of debris and impacted soil and backfilling in Area 2.

The currently anticipated Definable Features of Work (DFOW) or major activity based on currently known or defined information and the Scope of Work are as follows, each requiring an Activity Hazard Analysis (AHA):

- Mobilization, Setup
- Clearing Activities (vegetation and tree removal)
- Excavation of Soil and Debris
- Screening of Soil and Debris with Trommel
- Confirmation and Waste Characterization Sampling
- Backfilling and Site Restoration
- Transportation and Disposal of Waste

- Demobilization

Work for any task, activity, or DFOW will not begin until the AHA with assigned risk assessment code (RAC) for the work activity has been accepted by the Navy Technical Representative (NTR)/Remedial Project Manager (RPM) and is discussed with all engaged in the activity, including TtEC, subcontractor(s), and the Government on-site representatives at preparatory and initial control phase meetings.

### **3.0 STATEMENT OF SAFETY AND HEALTH POLICY**

TtEC is committed to providing our employees with a safe and healthful workplace. It is the goal of TtEC to continue excellent safety performance on all work that we undertake. TtEC will perform work in a manner that is consistent with our Zero Incident Performance® (ZIP) philosophy. We plan to perform the work in a manner that integrates safety and health considerations so that we eliminate risk of workers' injuries or illnesses, environmental releases/impacts, or property damage. In addition to the line and staff management functions described in this APP, each individual performing work under this contract is responsible for his/her own personal health and safety and for assisting in ensuring the health and safety of coworkers. This employee responsibility includes observing specified health and safety requirements and communicating with the designated Site Superintendent (SS)/Site Safety and Health Officer (SSHO) as appropriate, on matters such as the effectiveness of specified control measures, identification of new potential hazards, and other related issues.

An employee's failure to adhere to the requirements of this APP, observe specified safety requirements and restrictions, or to properly use identified protective equipment may lead to injury or illness. Accordingly, deviation from safety and health procedures is not tolerated. Failure to comply with health and safety procedures and requirements will lead to reprimand up to and including dismissal.

Health and safety-related information is communicated to employees through meetings, postings, written communications, and hazard reports.

Our Corporate Safety and Health Policy Statement is included as Appendix A to this APP.

#### **3.1 Contractor Accident Experience**

Table 3-1 (in the Tables section at the end of this APP) presents safety statistics for TtEC for the last 3 calendar years, as compared to the national averages for our industry. This comparison uses data collected by the U.S. Department of Labor, Bureau of Labor Statistics (BLS) for different types of employers, segregated by North American Industry Classification System (NAICS) codes.

## **4.0 RESPONSIBILITIES AND LINES OF AUTHORITY**

### **4.1 Statement of Responsibility**

TtEC is ultimately responsible for the implementation of its Environmental Health and Safety (EHS) Program for TtEC employees, subcontractors, and all others on the worksite. No person will be required or instructed to work in surroundings or under conditions that are unsafe or dangerous to his or her health. Each employee is responsible for complying with applicable safety and occupational health requirements, wearing prescribed safety and health equipment, reporting unsafe conditions/activities, preventing avoidable accidents, and working in a safe manner.

### **4.2 Identification and Accountability**

This section identifies the roles and responsibilities of TtEC corporate level and project level personnel and subcontractors, who are conducting field activities during the RA at AOC 2.

Industrial hygiene personnel and safety personnel resumes for persons listed in these roles below and for personnel designated as competent persons (CPs) or qualified persons (QPs) will be provided to the NTR/RPM for approval under separate cover and are not included with this APP. The credentials for the TtEC Safety and Health Manager (SHM) are on file with the Contracting Officer (KO) for this contract.

#### **4.2.1 Project Management**

Line management, managers, and supervisors ensure that the project activities are executed in accordance with TtEC's EHS programs, procedures, and applicable regulations. Line managers have primary EHS responsibility and have EHS personnel to support them in fulfilling this responsibility. Line managers have the responsibility to integrate loss-control principles into operations and to ensure:

- TtEC safety culture is preserved by demonstrating commitment and program involvement; safety remains a major project goal and is not subordinated to other demands.
- Project-specific continuous improvement goals and objectives are developed based on EHS events and issues and are communicated to TtEC's employees and subcontractors.
- Projects are implemented in compliance with environmental, safety, and health laws and regulations, as well as EHS program requirements.
- EHS plans are developed, approved, and implemented in accordance with TtEC's requirements.
- Personnel understand the requirements of the project's EHS plan(s) and that each individual understands his/her responsibility for plan implementation.
- Personnel have the required training and capabilities to perform the assigned tasks.
- Corporate professionals or external resources, such as private consultants, are available for project support as needed.
- Project staff members are aware of, and have access to, technical information that TtEC maintains, various EHS databases, and online regulatory subscription services.

- Additional EHS reference books and technical information are made available to project staff upon request.
- Facilities and equipment meet TtEC and government regulations.
- Work rules are enforced.
- Inspections and incident investigations are conducted per EHS program requirements.
- Effective corrective actions are implemented in a timely manner following inspections, audits, incident investigations, etc.
- Employees, including subcontractors, are not only encouraged but also required to notify their supervisor(s) of any actual or potential health and safety hazards in the workplace and to develop safe work methods and controls to be implemented in project AHAs.
- Employees and subcontractors are assured they will be rewarded for reporting health and safety concerns (not reprimanded).
- Clients are notified of TtEC's incident reporting procedures.
- Appropriate disciplinary action is implemented by line supervision when necessary.
- Management responsibilities necessary to maintain a safe, healthful, and environmentally compliant workplace are identified in each procedure of TtEC's EHS program.

#### 4.2.2 Project Manager (PM) – Mark Pisarcik

With respect to the EHS program, it is the responsibility of the PM to:

- Ensure implementation of this APP through coordination with the SS/SSHO and SHM
- Conduct quarterly inspections (when required) jointly with the SHM
- Participate in the incident investigations
- Ensure the APP has the required approvals before any site work is conducted
- Ensure the SHM and SS/SSHO are informed of project scope changes that require modifications of the APP
- Assume overall project responsibility for health and safety
- Ensure adequate resources are provided to the field staff to carry out their responsibilities (as outlined in this APP)

#### 4.2.3 Corporate SHM – Roger Margotto, CIH, CSP

The SHM will review and approve this APP and any amendments prior to their adoption. The SHM, who is a Certified Industrial Hygienist (CIH) will assist with implementation of the APP and provide project support on health and safety issues. The SHM will verify field personnel training, medical surveillance, and respirator fit test requirements. The SHM will advise the SS/SSHO regarding industrial hygiene concerns, interpretation and evaluation of analytical exposure data, and other safety-related issues, as needed. Subcontractor EHS plans will be reviewed by the SHM. It is also the SHMs responsibility to:

- Provide for the development and approval of the APP
- Serve as the primary contact to review any health and safety matters that arise
- Approve revised or new safety protocols for field operations

- Approve individuals who are assigned SSHO responsibilities
- Approve the SSHO to fulfill other project roles
- Approve any revisions of this APP and its' AHAs
- Approve upgrading or downgrading of personal protective equipment (PPE)
- Assist in the investigation of incidents
- Visiting the project as needed to audit the effectiveness of the APP

#### 4.2.4 Site Superintendent/Site Safety and Health Officer – Gary Phelps

For this project, the client has approved triple hatting for designated TtEC onsite supervisor. The person designated above will perform duties in the capacity of SS, SSHO, and Project Quality Control Manager (PQCM).

As SSHO, this individual will fulfill the duties and responsibilities as defined in corporate procedures and the SSHO is required onsite during Hazardous or Toxic Waste operations. The SSHO will have completed the 30-hour OSHA construction safety class or equivalent. The SSHO has 5 years of construction experience (a minimum of 1 year experience implementing EHS procedures at cleanup operations) and has had 24 hours of formal health and safety training in the last 4 years. The SSHO reports to the SHM and assists with the on-site implementation of relevant TtEC EHS programs and procedures (presented in Appendix B). The SSHO helps to ensure that operations are performed in compliance with applicable client- and site-specific requirements and government regulations.

The following are the respective responsibilities of the SS/SSHO (PQCM duties for this individual are contained in the Quality Control Plan):

- Ensure site personnel and subcontractors comply with the APP.
- Ensure that TtEC employees and subcontractors understand the requirements of the TtEC EHS program and procedures through training and communications.
- Coordinate with the subcontractor's supervisor, PM and SHM on matters regarding site safety and health.
- Maintain control of the work area and prevent any unauthorized persons from entering controlled work zones. If the unauthorized persons refuse to leave, the field crew personnel shall cease operations and notify Base Police who will remove these individuals.
- Halt or modify any work conditions or remove personnel from the task site if conditions are unsafe.
- Ensure all task site personnel understand and comply with all safety requirements contained in or referenced in this APP and the AHAs.
- Function as a technical resource for all environmental, safety, loss control, and industrial hygiene issues.
- Exercise stop work authority when warranted by conditions, in accordance with the project plans.
- Monitor team member's performance, including safety and quality control.
- Be responsible for implementing and enforcing all work plans.

- Supervising employees in daily operations.
- Overseeing the implementation of specified levels of PPE.
- Identifying potential problem areas and making corrective action recommendations to the PM.
- Implementing all corrective actions, and maintaining a daily log of work activities including noting any extraordinary occurrences.
- Conduct weekly safety inspections.
- Conduct incident investigations.
- Initiate corrective actions for observed safety violations.
- Update the Safety and Health Deficiency Log on a daily basis.
- Conduct daily safety meetings.
- Perform on-site exposure monitoring to determine/adjust appropriate levels and use of PPE.
- Perform site surveillances, hazard identification, and health risk analysis.
- Implement procedures and programs to eliminate risk to site personnel, including initiating changes to the plan.
- Ensure compliance with all environmental, health, and safety requirements, including corporate policies, programs, and procedures; OSHA construction management requirements; EM 385-1-1 requirements; and any client-specific requirements included in this plan.
- Ensure that adequate site security, appropriate for the activities being performed, is maintained.
- Implement site control measures.
- Maintain the field health and safety logbook.
- Provide summaries of field operations and progress to the SHM.
- Ensure that an adequate labor force is assigned to the project with the proper training, education, experience, skills, tools, equipment, and materials to complete the tasks and minimize potential impacts to the environment.
- Act as primary Emergency Coordinator (EC) in an emergency

#### 4.2.5 Field Crew Personnel – Various (TtEC, craft, and subcontractors)

Field crew personnel include the other persons entering the work site for the purpose of assisting in the completion of the project. This includes, but is not limited to, engineers, surveyors, facility representatives, TtEC management personnel, subcontractors, regulatory personnel, and site workers. It is the responsibility of field crew personnel to:

- Report any unsafe or potentially hazardous conditions or injury/accident/mishap immediately to your supervisor and the supervisor must report this to the SS/SSHO unless already informed.
- Maintain knowledge of the information, instructions, and emergency actions contained in this APP.
- Comply with rules, regulations, and procedures set forth in this APP and any instituted revisions.

- Initiate the incident reporting chain by notifying supervisor when involved in an incident/accident (if able to do so).
- Prevent admittance to work sites by unauthorized personnel (if the unauthorized persons refuse to leave, the field crew personnel will cease operations and notify the SS/SSHO, who will notify the Base Police and NTR/RPM for guidance).
- Perform daily inspections of tools and equipment, including PPE, prior to use.
- Conduct daily operations check of electronic equipment and annotate in the team's logbook or field form under direction of the SS/SSHO.
- Participate as directed in preparation and modification of the AHAs for work tasks.
- Assist the SS/SSHO with implementation and compliance with the APP.

#### 4.2.6 Subcontractors and Suppliers/Vendors

TtEC directs the subcontractor's supervisor regarding the work and the manner in which the tasks are to be performed. Subcontractors are responsible for assigning specific tasks to their employees; ensuring their employees are properly trained and are in compliance with applicable regulations; and allocating sufficient time, materials, and equipment to safely complete activities in accordance with this APP and their individual EHS plans. Subcontractors will attend TtEC's daily health and safety meeting prior to starting fieldwork.

#### 4.2.7 Competent Persons and Qualified Persons

CPs for anticipated health and safety-related issues that may arise on the project will be designated by the PM and stated by name in the AHA where a CP is specifically required by task (e.g., trenching and excavation). Subcontractor personnel will provide CPs as required where their tasks require a CP. The subcontractor CPs will also be designated by name in the AHA when required. For tasks that require a QP, the AHA will also designate the QP by name.

The names and proof of competency/qualification to meet specific OSHA requirements for OSHA qualified persons (QPs) or CPs designated in the AHAs will be provided to the NTR/RPM for review and acceptance at the time the AHAs are submitted for review and approval.

No work will occur onsite unless a designated CP/SSHO is present on the job site.

#### 4.2.8 Risk Management Process

This plan requires the preparation of an AHA for each task, activity, or DFOW. This plan also requires that these task analyses are reviewed with all workers and that workers acknowledge their review of safety and health requirements for each task. Where subcontractors are used to perform certain work activities, the SS/SSHO will ask the subcontractor to provide an initial AHA for review or the SS/SSHO will work with the subcontractor workers in the preparation of the AHA prior to start of the work activity.

The AHAs for these activities are not submitted with the APP submittal because AHAs created/submitted at this time would not be activity-specific as they are intended to be, especially

if subcontractors have not been identified or specific equipment needs have not yet been fully evaluated. Rather, the initial activity-specific AHAs will be prepared and internally reviewed and approved by the SHM, then will be submitted and accepted by the NTR/RPM at preparatory meetings, prior to work being performed. As new activities or tasks are identified or the work environment of the task changes, new or revised AHAs are prepared by TtEC. These revisions or new AHAs will be submitted to the SHM and the KO for review if the RAC increases from that of the original AHA.

Each worker performing tasks described in an AHA must receive training in the AHA and be allowed to make comments and suggestions regarding the AHA to ensure that all hazards are properly identified and that control measures are in place to mitigate these hazards. Retraining will occur if/when AHAs are modified.

### **4.3 Lines of Authority**

An organizational chart depicting the lines of authority is included as Figure 4-1. TtEC will require that the personnel and subcontractors follow the requirements in this APP and verify that this requirement is being met.

#### **4.3.1 Policies Regarding Noncompliance**

TtEC has a discipline program that is discussed in all new employee orientations and is also written in the TtEC Project Orientation, Rules and Safety Guidelines Handbook (TtEC 2014), a booklet that is given to every company employee. Briefly, the rules implement a progressive disciplinary program. However, if at any time there is a significant compromise of safety procedures; immediate termination of an employee is allowed by the procedure. The SS/SSHO will immediately report to the PM and SHM, observations of noncompliance in the performance of the subcontractor or workers.

#### **4.3.2 Manager and Supervisor Accountability for Safety**

TtEC EHS 1-1 of the Corporate Safety Program requires that:

“Line Management, the Project Manager, and supervisors, ensure that all company activities are executed in accordance with TtEC EHS programs, procedures, and applicable regulations. Line managers have primary EHS responsibility and have EHS personnel support to help them fulfill this responsibility.”

## **5.0 SUBCONTRACTORS AND SUPPLIERS/VENDORS**

### **5.1 Identification of Subcontractors and Suppliers/Vendors**

TtEC has identified Sealaska Environmental Services (Sealaska) as the primary subcontractor for this project. Sealaska will perform provide all labor and equipment for the following major work activities:

- Vegetation and tree removal (site clearing operations)
- Excavation of contaminated soil
- Contaminated soil and debris screening operations
- Backfilling excavations with clean fill
- Load out of waste for proper disposal

TtEC will provide the SS/SSHO and professional sampling staff for confirmation and waste characterization sampling efforts.

The subcontractors for the following DFOWs/activities are not known at this time, but additional information will be submitted to the APP for acceptance prior to the start of any activities listed below:

- Electrician (generator to trailer hookup)
- Private utility locates
- Surveyor
- Off-site Laboratory (sample analysis)
- Transportation and disposal vendors

## **5.2 Means for Controlling and Coordinating Subcontractors**

TtEC directs the subcontractor's supervisor on the tasks to be performed and the manner in which tasks are performed. Subcontractor supervisors are responsible for assigning specific tasks to their employees; ensuring that their employees are properly trained and are in compliance with applicable regulations; and allocating sufficient time, materials, PPE, and equipment to safely complete activities in accordance with this APP, and their SHM-reviewed individual EHS plans. Subcontractors' EHS plans are reviewed by the SS/SSHO or the SHM and if used, must be as stringent or more stringent than TtEC EHS Plans.

## **5.3 Safety Responsibilities of Subcontractors and Suppliers/Vendors**

Individuals employed by subcontractors and suppliers/vendors will receive a site-specific briefing regarding the site specific physical, chemical, or biological hazards present on the work site; required safety activities; and their individual roles and responsibilities for safety practices. While on site, all subcontractor supervisors will ensure their crews perform tasks that they are contracted to perform and that they follow at a minimum this APP and the task/activity AHAs. The SS/SSHO will observe their performance and have the contractor's supervisors ensure compliance.

Subcontractors are responsible for complying with this APP and all applicable federal, state, and local regulations. Subcontractor personnel must receive a briefing from the SS/SSHO prior to accessing the project work site. They must fulfill the requirements established by this APP and must acknowledge receipt of the plan and the hazard communication briefing. On-site subcontractors are responsible for providing their personnel with appropriate PPE as specified by the plan, however it is the ultimate responsibility of the SS/SSHO to ensure the APP is followed.

Prior to the commencement or continuation of work, subcontractor and third-party personnel have the authority to request a work area hazard assessment by the SS/SSHO. Any member of the work party observing an imminent safety hazard or potentially dangerous situation will immediately suspend field activities.

Most subcontractors have their own EHS plans and/or corporate policies that are specific to their specialty services. TtEC management is responsible for ensuring that subcontractor employees follow the policies and procedures of TtEC and this APP. If subcontractors' EHS plans are more restrictive, the subcontractor supervisors must ensure that their EHS plans are also followed.

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, both in the subcontractor's EHS plan and during the daily health and safety briefing. The contractor will inform the SS/SSHO of these hazards and assist in the development and/or revision of AHAs.

## **6.0 TRAINING**

The following training is required on this project.

### **6.1 New Hire SOH Training**

All new hire employees will receive TtECs EHS orientation training at the time of initial hire.

### **6.2 On-the-Job Training**

In addition to the required initial training, each employee will receive three days of directly supervised on-the-job training (i.e., close supervision during the first three days working in the field). This training will address the duties the employees are expected to perform.

### **6.3 Periodic Safety and Health Training**

In order to maintain competency, in addition to completing the 30-hour Construction Safety training, the SS/SSHO will receive 8 hours of documented formal, online, or self-study safety and health related coursework every year.

All project personnel will receive site orientation training at the start of work. This training will be repeated as necessary whenever work activities and site conditions change.

Workers with specific training and qualifications will receive recurrent training as required by regulation or certification credential requirement.

### **6.4 Hazardous Waste Operations Training and Refresher**

All site workers who work within an exclusion zone and may either be exposed to chemical related hazards are required by 29 Code of Federal Regulations (CFR) 1910.120/1926.65 to have completed 40 hours of HAZWOPER training. An 8-hour refresher course is also required on an

annual basis. Supervisors such as the SS/SSHO, and subcontractor supervisors/foreman must have completed 8 hours of additional relevant supervisory health and safety training.

## **6.5 Hazard Communication Training**

In accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200 and 29 CFR 1926.59), copies of material safety data sheets (MSDS) or Safety Data Sheets (SDS) for hazardous chemical materials that are used during site operations or that may be present on site will be available from the SS/SSHO. The SS/SSHO will conduct hazard communication (HAZCOM) training in accordance with 29 CFR 1910.1200 and 29 CFR 1926.59, Engineer Manual (EM) 385-1-1 (current version), and the HAZCOM program. Training will include, but will not be limited to, all hazards or potential hazards associated with work activities and any hazardous chemical materials brought to or found on the site. Effective December 1, 2013 all workers must have received training in the new OSHA HAZCOM standard incorporating the new labeling requirements, use of pictograms of chemical hazards, the new SDS form which is replacing the MSDS.

## **6.6 Site-Specific Training**

Prior to commencement of field activities, the SS/SSHO will provide site-specific orientation training on each element of this APP to all personnel assigned to the site. Site-specific training will address the activities, procedures, monitoring, and equipment for the work operations. Training will include site layout, hazards, evacuation route(s), emergency services at the site, and the HAZCOM program; and will highlight all provisions contained within the APP. This training will also allow field workers to clarify anything they do not understand and to reinforce each individual's responsibilities regarding health and safety for his or her particular activity. If additional training is required for completion of field tasks during the site work, then the SHM or SS/SSHO will either conduct the training or manage site personnel to ensure that tasks are conducted by appropriately trained personnel.

Personnel will also be trained in the site-specific emergency response plan, including: employee alarm system; evacuation procedures, routes, meeting places, and accountability; control of fuel sources; fire extinguisher education, minor spill control and cleanup procedures; reporting requirements; and rescue operations as applicable. AHAs for each DFOW or work task will also be reviewed by all employees involved in the task prior to the start of that activity.

## **6.7 First Aid and Cardiopulmonary Resuscitation**

The SS/SSHO will identify those individuals who have current first aid and cardiopulmonary resuscitation (CPR) training. At a minimum, two people (including the SS/SSHO) will have current CPR/first aid certification. The names of all CPR/first aid-qualified workers will be posted on the site bulletin board in the field office and/or maintained in each site vehicle. An automatic external defibrillator (AED) is currently not anticipated to be available onsite.

## **6.8 Bloodborne Pathogens Training**

Individuals on site who have first aid and CPR certification and who may provide first aid and/or CPR will have completed training in accordance with the TtEC Bloodborne Pathogens Program and the annual OSHA Bloodborne Pathogen Standard, 29 CFR 1910.1030.

## **6.9 Use of Portable Fire Extinguishers**

Project personnel will receive OSHA-compliant fire extinguisher education (29 CFR 1910.157[g]) for the use of portable fire extinguishers to respond to incipient stage fires. Typically this is given during site orientation.

## **6.10 Hearing Protection**

Users of personal hearing protection will receive OSHA hearing conservation program and hearing protector use training (29 CFR 1910.95[i],[k]). Typically this is given during site orientation.

## **6.11 Hazardous Materials Transportation Training**

United States Department of Transportation (DOT) training is required for all persons who prepare DOT shipping papers or who mark, label, and select packaging for purposes of transportation. The project Waste Management Plan includes specific requirements for this training and any other required training for management of waste. For this project, a portion of the waste is anticipated to be hazardous waste (respirator cartridges) and DOT regulated per 49 CFR 172.101 Hazardous Material Regulations; so training is required. Sealaska designated employees performing or supervising hazardous material operations and the TtEC SS/SSHO are required to have this training.

## **6.12 On-Site Health and Safety Briefings and AHA Review**

Project personnel and visitors will participate in daily on-site health and safety briefings conducted by the SS/SSHO, or designee (e.g., subcontractor supervisor) to assist site personnel in safely conducting their work activities. The briefings will include information on new operations, changes in work practices, or changes in the site's environmental conditions, including AHAs if modified. The briefings will also provide a forum to facilitate conformance with safety requirements, identify performance deficiencies related to safety during daily activities or as a result of safety inspections, and review any events (near-misses, injuries, material release, etc.). Work will be stopped and a safety briefing will be conducted following any event that could compromise the safety of personnel or the environment.

## **6.13 Training Certificates**

Copies of the required training certificates and licenses (as applicable) will be maintained on site and will be made available for government inspection upon request. Subcontractors will provide TtEC with copies upon request and these will be maintained onsite by the SS/SSHO.



## **7.0 SAFETY AND HEALTH INSPECTIONS**

Vehicle and heavy equipment inspections will be performed daily and will be documented on any vehicles and heavy equipment by the operator in accordance with TtEC Construction Procedure (CP)-7 (Appendix B). Weekly site inspections will be completed by the SS/SSHO in accordance with TtEC Corporate Environmental, Health, and Safety (EHS) 3-3 (Appendix B). Subcontractor personnel may be asked to participate in inspections. Daily inspections on the day(s) of scheduled field activities will be performed by the SS/SSHO and will be noted in the site activity logbook. The referenced field inspection forms are included in Appendix C. If any deficiencies are identified during the inspections, they will be noted on a deficiencies log as required by EM 385-1-1, Section 01.A.12d and corrected. Deficiencies to safety devices or equipment will be corrected before use or removed from service until they are fixed.

The inspections will be tracked for follow-up action on each of the respective forms. The inspection reports are reviewed and action items are followed-up. The SHM, or his designee, may conduct an unannounced inspection of the project.

### **7.1 Specific Assignment of Responsibility for a Minimum Daily Job Site Safety and Health Inspection During Periods of Work Activity**

Daily EHS inspections will be conducted by the SS/SSHO during this field effort to ensure safe work areas and compliance with the APP, AHAs, OSHA regulations, and EM 385-1-1 requirements.

### **7.2 Proof of Inspector's Training/Qualifications**

The SS/SSHO has completed the 30-hour OSHA Construction Safety Training, has 5 years of continuous construction industry safety experience in supervising/managing general construction (managing safety programs or processes or conducting hazard analyses and developing controls). In addition, the SS/SSHO maintains competency through having taken 8 hours of documented formal, online, or self-study safety and health related coursework every year to meet the requirements of EM 385 1-1 Section 01.A.17 in the role of SSHO.

CPs designated for excavation, hoisting and rigging, fall protection (if required), and/or other areas of expertise (which may be staff other than the SSHO and designated by the PM in AHAs) will be responsible for inspections performed in their assigned roles as CP for that task.

#### **7.2.1 Documentation Procedures**

The SS/SSHO will record any deficiencies in the on-site field logbook or in a daily safety report that is submitted with a daily report to the NTR/RPM and a copy submitted daily to the SHM.

#### **7.2.2 Deficiency Tracking System**

Deficiencies will be logged as required by EM 385-1-1, Section 01.A.12d. The items noted during field audits will be communicated to the TtEC EHS managers who maintain a

corrective/preventive action database. Responsibility for resolving each item noted during these audits is assigned and tracked through resolution. Results from field audits are also regularly communicated within TtEC through training and electronic means as a method of continuous program improvement.

## **8.0 MISHAP REPORTING AND INVESTIGATION**

A mishap is any unplanned, undesired event that occurs during the course of work being performed. The term “mishap” includes accidents, incidents and near misses.

When a mishap occurs, the employee must notify their supervisor immediately. The supervisor will notify the SS/SSHO. The SS/SSHO will notify the PM and the SHM. If the mishap is an emergency, TtEC will notify emergency services and respond as discussed in the Emergency Plans and will then follow up with internal reporting and investigation.

Recordable mishaps will be reported as soon as possible but not more than 24 hours afterwards to the KO/Contracting Officer’s Representative (COR) by the PM.

### **8.1 Immediate Notification of Major Accidents**

Immediate reporting of incidents is required within TtEC. In addition, if any accident has, or appears to have, any of the consequences listed below, TtEC management will immediately (generally within 1 hour) report the accident to the Mid Atlantic Naval Facilities Engineering Command (NAVFAC MIDLANT) NTR/RPM and the FEAD. The NTR/RPM will immediately follow up with official accident reports.

List of accidents to be immediately reported:

- a. Fatal injury/illness;
- b. Permanent totally disabling injury/illness;
- c. Permanent partial disabling injury/illness;
- d. One or more persons hospitalized as inpatients as a result of a single occurrence;
- e. \$500,000 or greater accidental property damage or damage in an amount specified by USACE in current accident reporting regulations (*currently we report government property damage \$2,000 or greater*);
- f. Three or more individuals become ill or have a medical condition which is suspected to be related to a site condition, or a hazardous or toxic agent on the site

In addition to the above, any mishap occurring in any of the following high hazard areas shall be immediately reported to the NTR/RPM. These mishaps shall be investigated in depth to identify all causes and to recommend hazard control measures. The NTR/RPM shall subsequently follow-up with official reports as prescribed by regulation. The NTR/RPM must also be notified immediately (within 24-hours) and provided follow-up investigative findings within 10-days of occurrence:

- a. Electrical – to include arc flash, electrical shock, etc.
- b. Uncontrolled release of hazardous energy (electrical and non-electrical)
- c. Load Handling Equipment or rigging;
- d. Fall from height (any level other than same surface); and
- e. Underwater diving

## **8.2 Additional Reporting Requirements**

In addition to the reporting requirements listed above, the employer is required to report:

- Property damage exceeding \$5,000
- Days Away injuries
- Days Away illnesses
- Restricted/Transferred injuries.

If a fatal injury, in-patient hospitalization or one or more persons as the result of a single occurrence, amputation, or loss of an eye occurs, the following additional steps will be followed:

- The SHM will initiate contact with OSHA.
- The work activities on the project must be stopped for 24 hours for a fatality.
- Assist the SHM and OSHA, as directed.

For the following types of incidents, the SHM will notify OSHA:

- Work related fatalities will be reported within 8 hours.
- In-patient hospitalizations (as noted above), amputations, or loss of an eye will be reported within 24 hours.

## **8.3 Accident Investigations, Reports, and Logs**

Except for rescue and emergency measures, the mishap scene will not be disturbed until it has been released by the investigating official.

After the oral reporting has been done, the SS/SSHO must complete a written-event report form within 24 hours. This form can be either prepared manually using the form found in the Tetra Tech corporate procedure or electronically using the corporate database. Within 72 hours, a completed investigation report must be submitted. The investigation report is part of the initial written report form. These forms can be completed by persons involved in the incident, but the investigation must be completed by the SS/SSHO. All reports will be reviewed by the PM and the SHM upon submission. 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. All recordable injuries, near-miss incidents, high loss potential incidents, property damage incidents costing more than \$500, first aid cases, and environmental spills (greater than reportable quantity) will be entered on the Tetra Tech program incident safety

database (TOTAL). This database summarizes the accident/incident history of the program from the start of the contract and on a year-to-date basis.

In addition to the above Tetra Tech procedures and after immediate notifications are performed, the PM or the SS/SSHO will complete, within 48 hours, a Contractor Significant Incident Report (CSIR)(see Appendix D), as required for any injury beyond first aid or for any government property damages \$2,000 or greater. The SS/SSHO will ensure that a report is prepared and the forms are completed as requested by the NTR/RPM and/or the PM and SHM.

#### **8.4 Exposure Data**

The SS/SSHO calculates exposure data on a weekly basis. Labor-hours worked are obtained from hours charged to a project for payroll purposes. The SS/SSHO also collects the number of subcontractor labor-hours worked by reviewing daily project production reports and recording the hours on those reports. The SS/SSHO will forward the labor-hours along with the Weekly Safety Report to the SHM, who will compile the monthly total (field staff only) and report that to the COR.

### **9.0 PLANS (PROGRAMS, PROCEDURES) REQUIRED BY EM 385-1-1, THE SAFETY MANUAL (AS APPLICABLE)**

TtEC has established written requirements for complying with regulations and implementing TtEC policy to prevent accidents and injuries. This section describes how some of these programs are implemented specifically for this project.

#### **9.1 Fatigue Management Plan**

A FMP must be completed as part of the APP whenever work hours:

- (1) Exceed 10-hours a day for more than 4 consecutive days;
- (2) Exceed 50-hours in a 7-day work week;
- (3) Exceed 12-hours a day for more than 3 consecutive days, or
- (4) Exceed 58-hours a week for sedentary [to include office] work.

During this project, work hours are anticipated to be 8 hour days Monday through Friday; however during soil excavation and load-out activities, work hours will be 10 hour days Monday through Friday. It is anticipated that there will be twelve 8-hour days' and eight 10-hour days' onsite. The SS/SSHO will likely work 10-hour days for 8-hour shifts and 12 hour days for 10-hour shifts performed by site workers.

A fatigue management plan is required for the activities that will be performed by affected workers on a 10-hour per day schedule as it is anticipated that this schedule will be required for more than 4 consecutive days. The following fatigue management plan for affected workers such as equipment and motor vehicle operators is included below.

### 9.1.1 Affected Workers

#### Equipment Operators

Operators of equipment such as hoisting equipment, mobile construction equipment, and hydraulically operated equipment are not permitted to exceed 12-hours of duty time in any 24-hour period, including time worked at another occupation. A minimum of 8 consecutive hours of rest\* between shifts in a 24-hour period is required.

#### Motor Vehicle Operators

Operators of motor vehicles, while on duty, shall not operate vehicles for a continuous period of more than ten 10-hours in any 24-hour period. In addition, no employee, while on duty, may operate a motor vehicle after being in a duty status for more than 12-hours during any 24-hour period. A minimum of 8 consecutive hours shall be provided for rest\* in each 24-hour period.

*\*The term “rest” is defined as a period of time during which the person concerned is off duty; is not performing work, including administrative tasks; and is afforded the opportunity for uninterrupted sleep. This does not include time for breaks, meals, or travel time to/from work.*

### 9.1.2 Management Responsibility

TtEC management and subcontractor management, as applicable, will assign the proper number of employees to each shift to complete the work safely and prevent fatigue. TtEC and subcontractors will have adequate numbers of personnel available to enable workers to take breaks, eat, relax and sleep. The PM should establish work-rest schedules based on the level of exertion of the tasks, the PPE utilized, the environmental conditions and other contributing factors. The PM is responsible for:

- Ensuring that workers assigned to projects where a formal fatigue management program has been implemented, receive initial and annual refresher training on fatigue management.
- Scheduling project work in a way that controls worker fatigue.
- Utilize ergonomically-friendly equipment on projects when applicable and feasible.
- Taking appropriate actions when workers on their project report concerns with tiredness/fatigue.

TtECs SS/SSHO will conduct fatigue management training for workers during site orientation to cover the topics in Section 9.1.3. The SSHO is responsible for:

- Enforcing work/rest schedules set by PM.
- Ensuring the work/rest cycle minimizes the risk of fatigue throughout the project by performing periodic hazard assessments.
- Monitoring workloads, work patterns and shift arrangements to ensure employees are not placed at risk from fatigue.
- Providing instruction about the risks of fatigue to employees through documented safety tailgate meetings.

Each individual worker is responsible for:

- Participating in fatigue management awareness training and employing the techniques to manage individual fatigue.
- Report issues of tiredness or fatigue to the project manager and SSHO. Work together to find the appropriate means to address the situation.
- Ensure that personal use of over-the-counter, prescription drugs and any other products does not affect their ability to safely perform the assigned work.

### 9.1.3 Training

Construction or large scale projects also present unique circumstances that can increase the potential for fatigue. In addition to the possibility of requiring travel in addition to the work on site during a particular shift, these types of projects may have the added fatigue potential associated with:

- Heavy physical activity
- Environmental factors including excessive noise, dust, sun exposure, temperature extremes, direct sunlight, etc.
- Large amount of activity and distractions on the site, including heavy equipment traffic
- Use of machinery and repetitive motions

#### 9.1.3.1 *Symptoms of Fatigue*

Fatigue is a feeling of tiredness or exhaustion and indicates a need to rest because of lack of energy or strength. Fatigue may result due to overworking, poor quality of or lack of sleep, worry, boredom, anxiety, depression, or lack of exercise. In addition, the following symptoms may indicate that a person is fatigued and the symptoms may vary between individuals:

- Tired eyes and having trouble keeping eyes open or blurry vision
- Tired legs or whole body tiredness
- Stiff shoulders
- Trouble concentrating
- Weakness or malaise
- Boredom or lack of motivation
- Bad mood
- Lack of energy
- Fixed gaze
- Itchy or watery eyes
- Being forgetful
- Difficulty starting or finishing tasks
- Poor decision-making
- Decreased hand-eye coordination
- Decreased attention to your surroundings or poor vigilance

- Decreased reaction time to respond to unsafe conditions
- Dizziness or vertigo, rapid heartbeat, or fainting (in some people, which may indicate if other underlying causes are contributing to the fatigue)

### *9.1.3.2 Avoiding and Controlling Fatigue*

The following will help with avoiding fatigue:

- Work within normal daylight hours (roughly 7 a.m. to 6 p.m.) whenever possible.
- Avoid rotating work hours around the clock by changing work times from day to evening, day to night, etc. (rotating shift work).
- Get sufficient sleep every night (minimum of 8 hours when possible).
- Try to make the sleep environment quiet, dark, comfortable, and temperature controlled.
- Schedule work tasks to allow for doing the most heavy or demanding work at times when workers are most likely to be alert and deliver peak performance, such as at the very start of the shift.
- Break up tasks that are labor intensive or repetitive amongst various workers to avoid overloading any one person. Utilize mechanical equipment versus hand methods for heavy lifting or repetitious tasks whenever possible.
- Eat a well-balanced healthy diet and get regular exercise. Avoid skipping meals.
- Balance coffee and caffeine laden beverage intake – know how your body reacts to caffeine and generally avoid intake in the late afternoon or evening.
- Minimizing work environment conditions that add to fatigue such as high temperatures or high noise levels.
- Train workers on how to recognize the signs and symptoms of fatigue.
- Be aware that driving between 1 AM and 6 AM is during the “fatigue high crash risk period”.
- Organizing social or recreational activities like games and contests to break up long shifts and give workers a chance to unwind.
- Reducing heat or cold stress in the work environment through engineering controls or administrative controls as appropriate.
- If experiencing chronic (long term fatigue) or prolonged periods of poor sleep, schedule an appointment with your doctor to determine and treat or manage possible underlying causes.

### *9.1.3.3 Adequate Sleep*

Adequate Sleep - will help in preventing fatigue by ensuring adequate sleep opportunities, proper sleep-period timing, and appropriate accommodations. Strive to prevent fatigue from occurring in the first place. The primary culprit for feeling fatigued is sleep loss. The first strategy for minimizing sleep loss is to establish a routine approach to obtaining sleep, one that allows enough time to obtain sufficient sleep, and ensures an appropriate sleeping environment. This means going to bed at the same time every night and waking up at the same time every day, allowing for at least eight hours of rest.

- Napping – Using napping as a fatigue countermeasure involves sleeping for brief periods during awake periods. Napping should not be used as a substitute for getting enough sleep during your regular sleep period. Additionally, naps should be limited to a time and duration that will not interfere with regular sleep periods. Napping too close to bedtime will produce a boost in alertness that may make it difficult to fall asleep during the regular sleep period.
- Anchor Sleep – A regular sleep period of at least four hours duration obtained at the same time each day. The anchor sleep period is supplemented by an additional sleep period taken when the schedule allows. This should be used as a coping mechanism for situations where you cannot get a full eight hours of sleep, but not as a routine. While split sleep periods may give you a sufficient amount on a short-term basis, getting your full sleep allotment in a single episode is preferred.
- Good Sleeping Environment – To ensure that sleep is restorative, sleeping environments must be quiet, dark and comfortable. Remove any noise sources, especially those that are unpredictable. Use of earplugs to reduce traffic noise or other external sounds helps many people, as well as the use of a constant low-level noise source such as a fan. Light can be reduced by using black-out shades or eyeshades. The bed and pillows should be appropriate for personal comfort and the temperature not too warm or too cold. Orient the clock face away from you so as not to worry about the time of day, especially when having trouble falling asleep.

#### *9.1.3.4 Recognizing Fatigue in Co-Workers*

The following recommendations are for recognizing fatigue in co-workers performing shift work; however are relevant to work performed on most construction/field sites Source: <http://shiftworkinformation.blogspot.ca/2008/02/recognizing-fatigue-in-shiftworkers.html>:

It is important for workers to be able to recognize fatigue's signs and symptoms and for managers and co-workers to know what to look for in others. Fatigue affects hand-eye skills, judgment, decision-making, responsiveness, and more. Fatigued workers take greater risks and make more errors.

Here are some warning signs to watch out for:

- Degraded performance while driving, monitoring equipment, operating and maintaining machinery, etc. This translates into degraded vigilance and decision-making and your margin for error, or safety margin, is decreased.
- Poor memory (forgetful), poor decisions, apathetic, lethargic, bad mood, and nodding off.
- Decreased hand-eye coordination, and poor communication and information processing.
- Poor decision-making - fixation on certain aspects of a situation to the neglect of other information.
- Poorer performance despite increased effort. People are poor judges of our own performance levels so it is important for co-workers to watch for this.
- Slowed reaction time: it takes longer to react to unsafe conditions, and to shut down equipment in time and to avoid obstructions when operating equipment.

- Reduced vigilance and lower alertness levels.
- Lapses in attention: inability to concentrate and keep a visual scan of instruments and gauges.
- “I just want to get finished” attitude. We tend to press the envelope of safety more because we are too tired to realize how badly the fatigue is affecting our performance, or we just want to be finished. We also accept lower standards.

When you see these signs in yourself or others, it is important to implement appropriate fatigue countermeasures, for the health and safety of the worker and the safe and smooth running of the operation.

#### 9.1.4 Controlling Fatigue

Workers who drive long distances to and from work may consider possible ride-sharing with other co-workers if a possibility so as to rotate driving tasks during the week (alternating drivers). Workers who drive trucks and vehicles during work shifts may have a higher potential for fatigue when getting behind the wheel for the drive home from work and also, if the commute is long, may not have sufficient time for rest between shifts. The PM should be made aware of this extended “work shift” due to travel and evaluate the way work is organized, managed and performed to minimize this occurrence.

Management will perform adequate scheduling to afford sufficient opportunity for worker rest. If night shifts are required (not currently anticipated), TtEC will limit the number of consecutive night shifts performed by the same workers. TtEC supervisors will rotate jobs to prevent repetitive work, and will provide breaks at critical times in the work cycle. TtEC management will evaluate and control environmental factors (e.g., excessive heat, excessive cold, and PPE use), and will use the buddy system for working alone or in isolated locations, and evaluate alternate transportation for long commutes.

## 9.2 **Emergency Plans**

Emergencies involving physical hazards, including fires are generally readily apparent visually. Injuries and medical emergencies, including potential exposure to hazardous materials may not always be so apparent. Tasks to be performed at the site, potential hazards associated with those tasks and the recommended control methods are discussed in this APP and associated AHAs. Early recognition of hazards will be supported by daily site surveys to eliminate any situation predisposed to an emergency. The SS/SSHO are responsible for performing surveys of work areas prior to initiating site operations and regularly while operations are being conducted. Survey findings are documented by the SS/SSHO in the site health and safety logbook. Site personnel are responsible for reporting situations they perceive as hazardous and correcting those hazards which are immediately correctable (e.g., removing tools or materials that may present a trip hazard).

The above actions will provide early recognition for potential emergency situations, and allow TtEC to instigate necessary control measures. However, if the SS/SSHO determine that control measures are not sufficient to eliminate the hazard or an emergency situation occurs, TtEC will

withdraw from the site until the hazard can be effectively managed or eliminated and notify the appropriate response agencies whenever a hazard presents an emergency situation.

Emergency plans have been prepared to address employee safety in case of fire, injury or medical emergency, inclement weather, and spills of hazardous materials. These emergency plans will be reviewed with all affected employees and will be tested to ensure their effectiveness. The emergency plans also include information on communication, emergency equipment, first aid/CPR qualifications, and means of rescue.

In the event of an emergency during on-site work, the primary response action by on-site personnel will be to safely assemble and evacuate to an area unaffected by the emergency and notify the SS/SSHO and render the appropriate level of response (**including calling Base Fire and Rescue or Base Police at (757) 887-4911**) from cellular telephones and support as is included in these plans.

There are Base emergency services at CAX capable of providing immediate response to site emergencies in the event a fire or explosion, injury or medical emergency occurs; and these agencies will be notified in the event of an emergency and communicating the nature of the emergency so that dispatch of appropriate responders can be determined and deployed. The PM, SHM, and FEAD, and NTR/ RPM will be notified if Base Emergency Response is contacted.

TtEC personnel will provide insipient emergency prevention activities such as:

- Initial (e.g., non-structural) fire-fighting support (fire extinguisher) and prevention.
- Initial spill control and containment measures and prevention
- Evacuation of personnel from emergency situations beyond the initial response level
- Initial medical support for injury/illness requiring only first aid-level support

TtEC will not provide emergency response support beyond their on-site capabilities and their training.

### 9.2.1 Pre Emergency Planning

Based on the nature of the planned activities, emergencies resulting from physical or chemical hazards such as personnel exposures, fires, or explosions, injuries, or medical emergencies could result. To minimize or eliminate the potential for these emergency situations, pre-emergency planning activities will include the following (which are the responsibility of the SS/SSHO with participation by subcontractor personnel):

- Coordinating with the local emergency response personnel and local hospitals prior to the commencement of work to ensure that TtEC emergency action activities, including rescue and escape capabilities are compatible with existing TtEC, subcontractor, and local emergency response agencies.
- Establishing and maintaining information and equipment at the project staging areas (support zone [SZ]) for easy access in the event of an emergency.

- Training of all workers to the requirements of these emergency plans and the location of emergency equipment, evacuation routes, and locations.
- Evaluating emergency procedures via drills and updating plans as required when procedures are ineffective or situations change.
- Creating and maintaining documents on site that can be important in the event of an emergency situation, including:
  - A entry/exit log identifying personnel on site each day
  - Site layout and emergency evacuation routes (Figure 9-1)
  - Hospital route map with directions from site (Figure 9-2)
  - Emergency equipment list and locations (Table 9-1)
  - Emergency notification – phone numbers (Table 9-2)
  - Completed (voluntary) medical data sheets (Appendix E) for on-site personnel
  - A chemical inventory of hazardous chemicals on site (Appendix F)
  - Corresponding MSDS or SDS (Appendix F)
  - Base Emergency Number Flyer (Appendix G)

At the beginning of the field work, the EC (SS/SSHO) will hold an emergency evacuation drill. The drills require evacuations of the site to the designated evacuation area. The SS/SSHO will, after the drill, conduct a written debrief meeting with all participants. The SS/SSHO will prepare a short report with recommendations for improvement of the evacuation plan when necessary and if required, the emergency evacuation plans will be updated accordingly. During a drill, it is important that all communications by the team indicate that “this is a drill.” Emergency drills will be conducted such that adjacent operations are not affected by the drill and emergency service agencies will not be contacted.

### 9.2.2 Personnel and Lines of Authority for Emergency Situations

The SS/SSHO will serve as the primary EC until emergency response personnel arrive on site and take command. If the SS/SSHO is involved in the emergency (e.g., injured), the Sealaska foreman is the alternate EC.

In the event of an emergency, personnel will safely halt operations and evacuate to a safe area and the EC will be in charge until emergency responders arrive and take command. The supervisor in charge will conduct a head count to determine that all employees have been safely evacuated and are accounted for.

### 9.2.3 Emergency Signal, Assembly and Evacuation Procedures

In the event of an emergency situation, the EC (or a supervisor) will activate an air horn (or vehicle/equipment horn if available) to signal an evacuation. The emergency signal will be **steady long beeps** indicating the initiation of evacuation procedures.

An evacuation will be initiated whenever recommended hazard controls are insufficient to protect the health, safety, or welfare of site workers. Specific examples of conditions that may initiate an evacuation include, but are not limited to, the following: severe and sudden extreme weather

conditions, fire or explosion, evidence of acute personnel overexposure to a chemical, discovery of unanticipated waste materials that are unknown, and emergencies that could also occur due to activities or conditions not directly related to site work (adjacent operations).

In an emergency, personnel in affected work zones will immediately and safely stop work and assemble near the support zone (SZ), or other safe area (upwind whenever possible) as identified by the SS/SSHO (or immediate supervisor of that operation) where accountability of personnel will be performed. Personnel will then proceed to the designated evacuation area.

The TtEC field office trailer has been designated as the evacuation area for work activities; however if the field office is not considered to be safe, an alternate evacuation area will be selected based upon wind direction and nature of the emergency. The primary emergency evacuation area and routes are shown on Figure 9-1.

The location of assembly and evacuation areas and routes will be upwind of the site as determined by the wind direction whenever possible. The SS/SSHO will ensure that diagrams showing these safe egress routes and location of assembly areas and evacuation areas are kept current. All site personnel will be briefed of the assembly and evacuation locations and routes (including alternate locations for each work location and will be updated whenever these change).

Figure 9-1 has been included to show the site layout and location of primary evacuation areas and secondary evacuation area. From the evacuation areas, the maps showing the route to the nearest emergency hospital (Figure 9-2) - **Riverside Doctors' Hospital Williamsburg, 1500 Commonwealth Avenue Williamsburg, VA 23185** will be used if emergency medical services are required.

For efficient and safe site evacuation and assessment of the emergency situation, the EC will have the authority to initiate proper action if outside services are required. Under no circumstances will incoming personnel or visitors be allowed to proceed into the area once the emergency signal has been given and the order to evacuate is issued. Once the alarm has been sounded, the EC must establish that access for emergency equipment is provided and that the equipment that may cause combustion has been shut down if safe to do so. As soon as possible, and while the safety of the personnel is being confirmed, emergency agency notification (Base Fire and Rescue or Police) will commence. The SS/SSHO will brief site personnel each day or when the location of either the assembly or evacuation area is revised.

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

- Declare the evacuation via cellular telephones, hand signals, voice commands, and line of site communication, two-way radios, or vehicle/air horns as necessary.
- The following signals shall be used when communication via vehicle horn or air horn is necessary:
  - **Steady long beeps will be used to indicate emergency situations**
- Report to the designated evacuation area for accountability.
- Nobody is allowed back into the work area until the SS/SSHO, PM (or NTR/RPM) has

given the “all clear” for employees to return to the site.

- Describe incident precipitating the evacuation to the SS/SSHO with pertinent incident details.

#### 9.2.4 Emergency Equipment

The emergency equipment listed in Table 9-1 will be strategically placed and maintained on site in accessible locations:

- Fire extinguishers will be maintained on site and shall be immediately available for use in the event of an emergency.
- Site personnel will be trained in the use of the fire extinguisher as part of site-specific training.
- An industrial first aid kit meeting the requirements of OSHA and EM 385-1-1, Section 03.B.01, and a bloodborne pathogens kit will be readily available and visible at the work site. The location of each first-aid kit will be clearly marked, and kits will be protected from the weather and maintained clean. The kit must contain all the items listed in Table 3-1 of the EM 385-1-1 manual and include one pocket mouthpiece or CPR barrier and latex gloves (bloodborne pathogens kit). The kit will be inspected weekly, and items will be replaced as they are used.
- An emergency eyewash station will be available at the work site and will be inspected weekly by the SS/SSHO to ensure that the eyewash station is functional, maintained in clean condition, and that water is changed at least weekly unless a preservative solution is used.
- Spill kits will be available in active work locations and fuel storage or refueling locations and will be stocked with a sufficient amount of absorbent material for the type and quantity of hazardous material that could be spilled during the operation, including operating mobile construction equipment.
- An air horn (unless vehicle/equipment horns are immediately available for use).
- A means of communication (within immediate reach) for notifying Emergency responders (e.g., cellular telephone or radio that can reach a dedicated person with access to a cellular telephone (remote locations).
- Emergency contact list with telephone numbers as shown in Table 9-2.
- Emergency evacuation area location and routes map to hospital as shown in Figures 9-1 and 9-2.
- Appendix G showing Cheatham Annex Emergency Contacts

#### 9.2.5 Posting of Emergency Telephone Numbers

The list of emergency telephone numbers in Table 9-2 and Appendix G will be maintained at the telephone communications points in the field office and any SZ.

### 9.2.6 Spill Emergency Plan

The following procedures are required to prevent and minimize releases of hazardous (or potentially hazardous) materials:

- All containers of hazardous materials located on-site will be labeled as to contents and associated hazards.
- Hazardous materials will only be brought to the site in the minimum quantities needed to get the immediate task performed.
- A Hazardous Material Inventory as well as MSDS or SDS for hazardous materials used on-site will be kept in a binder at the field office. The Hazardous Material Inventory and MSDS/SDS will be included in Appendix F, as materials are brought on site and will be updated as additional hazardous material is identified for use on the project.
- All containers will be constructed with closeable lids, which will be kept closed except when in direct use.
- Fuel containers will be metal, Underwriter's Laboratory-listed and in good condition.
- Preventative maintenance will be performed on construction equipment, and vehicles minimize chances for hose and other equipment failure.
- Other maintenance (major maintenance or oil changes) will be performed off-site at an equipment repair facility.
- Good housekeeping operations will be followed and hazardous materials will be stored in authorized storage areas.
- Absorbent materials (e.g., sorbent pads, sorbent socks, chemical protective gloves, and bags) will be staged in the SZ for responding to potential spills that could occur during heavy equipment and refueling tasks. Spill control equipment will include, at a minimum, absorbent pads, chemical protective gloves, and disposable bags as well as tools such as shovels and brooms.
- Portable spill basins or secondary containment structures will be placed under refueling points during refueling or transfer of fuel.
- Refueling of heavy equipment will be done through a fuel delivery vendor and by the vendor operator who is in constant supervision of that task. Overfill prevention during refueling will be verified visually by the operator.
- Hazardous materials handling operations will not be conducted when the weather could cause significant risk to surrounding area if a spill should occur.
- Perform the transfer of any hazardous materials (e.g., fuel) in a well-ventilated area.
- A spill kit will be placed near fueling points and will contain sorbent materials such as socks and sorbent booms.

In the event of a spill:

- If the spill is an emergency the SS/SSHO will contact the Base Fire and Rescue at **(757) 887-4911**.
- The SS/SSHO will then notify the PM, NTR/RPM, FEAD, and Base Environmental Office, and SHM.

- Any spill quantity is reportable internally and to the client.
- TtEC will assist the NTR/RPM and Base Environmental Office with any required notification to regulatory agencies if the spill is reportable to agencies.
- In no case will TtEC report a spill to a regulatory agency without first notifying the client and getting concurrence.
- An investigation and incident report will be prepared and corrective actions identified.

### 9.2.7 Fire Emergency Plan

Workers will not fight any fires other than incipient stage fires.

There will be at least one fire extinguisher (refer to Table 9-1) at each active work location. Fire extinguishers will also be located in each piece of mobile construction equipment and in the crew pickup trucks. The fire extinguishers are intended to fight only small fires that have recently occurred and can be reasonably extinguished immediately (incipient stage fires). In no case will workers attempt to fight any fire that cannot be reasonably extinguished within 30 seconds to 1 minute.

If a fire breaks out, call (or designate someone) to call 911 before attempting to put out the fire (incipient stage only) and only if fighting the fire does not put anyone at further risk. Ensure a means of egress is available in the event the fire cannot be extinguished.

To use the fire extinguisher, remember the word P.A.S.S. – pull the pin, aim the nozzle at the base of the fire, squeeze the lever, and sweep side to side at the base of the fire. Workers will be given fire extinguisher training during project orientation.

Fire extinguishers will be inspected by the SS/SSHO initially and then on a monthly basis (at a minimum). Additionally, all fire extinguishers will be inspected and serviced annually by a qualified professional. Any defective or partially-used fire extinguisher will be red-tagged and taken out of service until such time that it can be serviced. Fire extinguishers will be secured or supported when transported and in storage. During project demobilization, all fire extinguishers and other hazardous material will be properly dispositioned for further use at other TtEC projects.

In the event of a fire, contact the appropriate emergency authorities by calling **757-877-4911** (Base Fire and Rescue) as specified in Table 9-2 – Emergency Contact Information and Appendix G. Any fire must also be reported to the PM, NTR/RPM, FEAD, and the SHM. The person reporting the fire is required to provide the following information to responding emergency personnel:

- His/her name
- Location of the fire (street name and nearest cross-street, etc.)
- Number of injured persons 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

### 9.2.8 Medical Emergencies

In the event of a medical emergency, first aid and CPR assistance will be provided by CPR/ first aid trained individuals. The injured party will be moved as minimally as possible if the scene remains safe for the injured or ill person and first aid responders or responding emergency personnel. If it is safe to move the person without further injury or the location may become compromised, the person will be moved to the nearest appropriate location for continued care. No person will enter an unsafe location; however, to rescue an injured worker if the scene poses a hazard that could injure or trap the would-be rescuer.

Medical emergencies, should they occur on the project site, will typically rely on emergency responders as determined by emergency dispatch personnel for patient stabilization and transport to the hospital. In the event of a medical emergency in which actual or suspected serious injury occurs, the following procedures will be implemented:

- Survey the scene and evaluate whether the area is safe for entry.
- Render first aid and CPR as necessary.
- Obtain emergency medical services for ambulance transport to a local hospital by calling Base Fire and Rescue from a cellular telephone at **(757) -877-4911**. This procedure will be followed even if there is no visible injury. Provide the following information to the emergency dispatch personnel:
  - Identify location by address or nearest cross street and request medical assistance, and provide a name and telephone number. Stay on the line with dispatch.
- Other personnel in the work area will be evacuated to a safe distance until the EC determines that it is safe for work to resume. If there is any doubt regarding the condition of the area, work will not commence until the hazard control issues are resolved.
- Notify the PM and SHM as well as the client. The PM and SHM will notify the NTR/RPM if not already notified.

The nearest emergency hospital to Area 2 is the **Doctors' Hospital Williamsburg, located at 1500 Commonwealth Avenue in Williamsburg, Virginia**

The location of and directions to this hospital from the site are included in Figure 9-2, and contact numbers for both the hospitals and Base Fire and Rescue and WorkCare® are provided in Table 9-2. The SS/SSHO is instructed to drive by the emergency hospital to ensure that it is accessible and available and that the most efficient routes (primary and alternate) are identified during mobilization and accurately reflected in Figure 9-2.

### *9.2.8.1 Decontamination during Medical Emergencies*

Based on the nature of the planned activities, the need for specific personal decontamination activities in an emergency medical situation is unlikely as the contaminants of concern are not highly hazardous for contact and are not in liquid form where saturation of a worker is likely to occur; however, when dry, these contaminants could become airborne in dust and become an inhalation exposure hazard to the victim or responders. In addition, workers with potential dermal contact with contaminated soil will typically be wearing PPE.

If during refueling, workers are saturated with fuel product, decontamination may be required. If decontamination becomes necessary, decontamination procedures will be performed only if doing so does not further jeopardize the welfare of the involved personnel. Decontamination will be postponed if the incident warrants immediate evacuation.

As soon as possible and prior to transportation to a medical center:

- The contaminated site worker will be brushed of (gross soil) and rinsed with water as necessary
- Contaminated clothing will be removed and disposed of (wrap with dry blanket if possible)
- First aid treatment will be rendered
- If decontamination is not feasible, as much information as is known will be provided to emergency responders about the potential contaminants.

### *9.2.8.2 First Aid*

TtEC will ensure that a minimum of two people on site (SS/SSHO plus at least one Sealaska employee) have current certifications in CPR, first aid, and bloodborne pathogens. Additional qualified persons will be listed on the bulletin board in the field office. Other than rendering basic CPR and first aid, these employees are not expected to perform emergency medical duties; however, they are authorized to perform emergency rescue or other duties up to the level of their training.

For first aid injuries that are not deemed an emergency situation, appropriate care following first aid may include stabilization and transport to a nearby urgent care or occupational medicine clinic for evaluation. The SS/SSHO will evaluate the location of the nearest occupational medicine provider by contacting the clinic and determining if the clinic accepts TtEC worker's compensation insurance (provided by AIG) during mobilization for these non-emergency injuries or illnesses. Subcontractors will be instructed to do the same as per their corporate procedures. WorkCare® will be contacted immediately following appropriate first responder patient care or when the patient is transferred to emergency responder personnel in order to help assist with patient and case management and recommendations.

### 9.2.8.3 *Medical Data Sheet*

Each field team member, including subcontractors, will be asked to complete and submit a copy of the Medical Data Sheet (see Appendix E). This sheet is voluntary but encouraged and will be provided to the SS/SSHO, prior to participating in site activities. The purpose of this document is to provide site personnel and emergency responders with additional information that may be necessary in order to administer medical attention if the victim is unable to communicate. Any pertinent information regarding allergies to medications or other special conditions should be documented. This data sheet will be maintained confidential by the SS/SSHO and information shared only to the extent necessary to support medical care of the individual and will be destroyed upon close of the project.

### 9.2.9 Inclement Weather

The potential for severe weather is possible as the site is located along the Atlantic seaboard where storms can occasionally be severe, including thunderstorms with associated lightning and potential hurricane force winds seasonally.

The SS/SSHO will monitor the weather forecast a minimum of two times per day and more frequently as required (e.g., when a storm is forecast in the area). If particularly ominous weather conditions are predicted (e.g., approaching thunderstorm cell, tropical storm, etc.), the SS/SSHO will monitor radio broadcasts or National Weather Service reports regularly and management will evaluate the situation and take appropriate action in advance of the storm to maintain worker safety, including travel to and from work and to evaluate shutting down of the site, securing of equipment, or specific tasks (or the entire site) as necessary before the storm arrives.

In preparation for an approaching storm, the SS/SSHO will determine the appropriate length of time that it will take to safely halt operations in advance of the storm so that work can be halted with enough advance time for safety of crew and equipment. Equipment will be secured and all doors and windows of the equipment (e.g., excavator cabs) and office trailer will be closed. Tools and supplies will be stored in a designated secure location.

For this project, safe locations for severe weather emergencies will be determined by the EC. Extra time may warrant consideration if the site is to be evacuated and workers sent home.

Nearby thunderstorms, if present could have lightning associated with them. Whenever a thunderstorm arises, the SS/SSHO will determine if lightning is within 10 miles of the site. Once lightning is seen, count the number of seconds until you hear the thunder. Divide number of seconds by 5 to get the distance the lightning is away from you. If lightning is 10-miles away or less, work should stop until 30-minutes after the last audible thunder or visible flash of lightning. A lightning meter may be used as well, if available onsite. If lightning is observed, all load handling equipment work, excavation work, trommel screening work, and other hazardous work will stop until no lightning activity is observed for a minimum of 30 minutes and all outdoor workers will seek shelter in a full enclosed vehicle cab or other fully enclosed structure such as the field trailer.

The SS/SSHO will assess what work procedures can be safely performed when wind conditions exceed 20 mph for any hoisting activity and other activities that can be affected by wind, lesser wind speeds may require consideration of work suspension depending upon conditions. They will also give consideration to fugitive dust emissions, the safety of equipment in high winds, and protection of workers from flying debris.

#### *9.2.9.1 Hurricane Preparedness Plan*

Hurricane season starts June 1 and ends November 30. The following information is from [www.nhc.noaa.gov/prepare/wwa.php](http://www.nhc.noaa.gov/prepare/wwa.php):

- **Tropical Storm Watch:** An announcement that tropical-storm conditions are possible within the specified area.
- **Hurricane Watch:** An announcement that hurricane conditions are possible within the specified area.

Because outside preparedness activities become difficult once winds reach tropical storm force, watches are issued 48 hours in advance of the anticipated onset of tropical-storm-force winds.

*Action:* During a watch, prepare and review your plan for evacuation in case a Hurricane or Tropical Storm Warning is issued. Listen closely to instructions from local officials.

- **Tropical Storm Warning:** An announcement that tropical-storm conditions are expected within the specified area.
- **Hurricane Warning:** An announcement that hurricane conditions are expected within the specified area.

Because outside preparedness activities become difficult once winds reach tropical storm force, warnings are issued 36 hours in advance of the anticipated onset of tropical-storm-force winds.

*Action:* During a warning, complete storm preparations and immediately leave the threatened area if directed by local officials.

- **Extreme Wind Warning:** Extreme sustained winds of a major hurricane (115 mph or greater), usually associated with the eyewall, are expected to begin within an hour.

*Action:* Take immediate shelter in the interior portion of a well-built structure.

When a warning of gale force winds is issued, the SS/SSHO will have supervisors and workers take precautions to minimize danger to persons, and protect the work and nearby TtEC and Government property. These precautions include, but are not limited to: closing openings; removing loose materials, tools and equipment from exposed locations; and securing temporary work. Close openings in the work areas (e.g., windows, doors, bins, equipment cabs, etc.) when storms of lesser intensity pose a threat to the work or any nearby TtEC or Government property.

It is advised that before an emergency, each contractor secure emergency disaster kit with nonperishable food, potable water (at least one gallon per person for each day) and other supplies (e.g., flashlights, first aid kit, emergency NOAA weather radio, blankets, toiletries, etc.) in sufficient quantity for their personnel to last for at least 72 hours. In addition, persons should, if time allows, have their prescription medicines with them when they seek shelter and let the PM know the location where sheltering will occur.

There are four hurricane conditions of hurricane readiness. Unless directed otherwise, the SS/SSHO will comply with the following directives and direct contractor and subcontractor personnel as follows:

- a. **Condition FOUR** (Sustained winds of 50 knots or greater expected within 72 hours):  
Normal daily jobsite cleanup and good housekeeping practices. Collect and store in piles or containers scrap lumber, waste material, and rubbish for removal and disposal at the close of each work day. Maintain the construction site including storage areas, free of accumulation of debris. Stack form lumber in neat piles less than 4 feet high. Remove all debris, trash, or objects that could become missile hazards.
- b. **Condition THREE** (Sustained winds of 50 knots or greater expected within 48 hours):  
Maintain "Condition FOUR" requirements and commence securing operations necessary for "Condition ONE" which cannot be completed within 18 hours. Cease all routine activities which might interfere with securing operations. Commence securing and stow all gear and portable equipment. Make preparations for securing buildings. Review requirements pertaining to "Condition TWO" and continue action as necessary to attain "Condition THREE" readiness. Contact COR for weather and Condition of Readiness updates and completion of required actions.
- c. **Condition TWO** (Sustained winds of 50 knots or greater expected within 24 hours):  
Curtail or cease routine activities until securing operation is complete. Reinforce or remove form work and scaffolding. Secure machinery, tools, equipment, materials, or remove from the jobsite. Expend every effort to clear all missile hazards and loose equipment from general base areas. Contact COR for weather and Condition of Readiness updates and completion of required actions.
- d. **Condition ONE.** (Sustained winds of 50 knots or greater expected within 12 hours):  
Secure the jobsite, and leave Government premises.

Personnel will leave the site upon a notice to leave the premises and each supervisor will ensure their personnel and families (as applicable) are instructed to gather together offsite in a safe place of refuge such as a storm shelter. The SS/SSHO will notify the PM as to the status of the crew and evacuation notice. Stay away from windows and doors during a hurricane and stay indoors. Await official word from emergency personnel if a hurricane does occur before leaving safety of shelter or driving on any roads. Prior to returning to work after a hurricane, the SS/SSHO will (with Government permission) conduct an evaluation of any worksite damages and precautions that may

be required prior to allowing workers to return to work and will report damages to the PM, SHM, and COR.

### **9.3 Site Sanitation/Housekeeping Plan**

Sanitation facilities will be provided and maintained onsite as required in Section 2 of EM 385-1-1. TtEC will provide portable toilet and hand washing (soap and water) facilities at the project worksite. Where it is not practical to provide running water, hand sanitizers (at least 60% ethyl alcohol) may be provided and workers must be trained in proper use of the sanitizer. These facilities will be ventilated and serviced on and as needed, but not to exceed a weekly basis, maintained in sanitary condition, and located in an accessible location to work activities. Individual disposable paper towels will be available. The minimum number of toilet facilities will be provided in accordance with Table 2-1 (other than construction sites) or Table 2-2 (construction sites) in EM 385-1-1.

Potable water will be provided for washing hands and face and for any drinking water provided to employees. During hot weather, cool drinking water will be provided. Drinking water will be from a local municipal water supply or store-purchased bottled water whenever possible. Potable drinking water containers with lids will be marked “drinking water” and will not be used for any other purposes with disposable cups or TtEC will provide bottled drinking water purchased from a vendor.

Any outlets or containers that dispense non-potable water will be labeled as “Caution – water unsafe for drinking, washing, or cooking.” There will be no cross-connection, open or potential, between a potable water system and system furnishing non-potable water.

Workers will discard all food debris and other detritus in a designated refuse container with closing lid onsite that will be serviced regularly by a sanitation vendor. Used disposable PPE and other project wastes will be managed as detailed in the project Waste Management Plan in a manner that does not allow for the spread of contamination by rain, wind, or spills/releases.

Good housekeeping procedures will be maintained throughout the duration of work and regular cleaning will be performed to maintain safe and sanitary conditions in the workplace. Workroom floors will be kept as dry as possible, with appropriate drainage if wet processes are used. Floors and working surfaces will be kept free of protruding objects, splinters, loose boards, clutter, and unnecessary holes and/or openings.

### **9.4 Medical Support Agreement**

The project DFOWs, activities, and tasks are all anticipated to have a “medium” RAC, therefore the medical support agreement is not required to be in writing.

TtEC and subcontractor crews will have working cellular telephones capable of communicating between teams and dialing Base Fire and Rescue or Base Police if required. TtEC and subcontractors have work trucks that can transport a worker to a designated emergency evacuation

area (if required and if the workers is able to be moved) where emergency responders can then transport the injured person. All communication devices will be regularly tested in the work areas of use to assure functionality.

Table 9-2 in the tables section of this APP includes the telephone numbers of physicians, hospitals, or ambulances for emergency medical support along with project personnel emergency contact names and numbers. Appendix G also includes Base Emergency Contacts. Table 9-1 and Appendix G will be conspicuously posted, at a minimum, on the safety bulletin board and near the on-site project office telephones, and/or in the support zone if office is not present or close by (mobile field crews).

Medical responders who are expected to treat injured employees will be informed of the nature of the work to be performed and the injuries/illnesses prevalent on such jobsites by the SS/SSHO during or prior to mobilization as required.

Figure 9-2 in the figures section of this APP, contains a highly visible map delineating the best route to the nearest emergency hospital listed in Table 9-2. A copy of this map will be posted on the safety bulletin board and/or in the support zone if office is not present or immediately available (e.g., mobile field crews).

The project site (each active work area) will have a first aid kit (one for every 25 or fewer employees) that complies with the criteria contained in ANSI Z308.1. In addition to the basic fill requirements, each kit will be supplied with optional fill contents commensurate with the hazards found in the work environment as recommended by consultation with a local health care professional.

A minimum of two first aid/CPR qualified persons will be onsite for each shift. Names of all first aid/CPR qualified persons will be posted on the office bulletin board or support zone for field crews.

## **9.5 Bloodborne Pathogen Program**

Bloodborne pathogens enter the human body and blood circulation system through punctures, cuts, or abrasions of the skin or mucous membranes. They are not transmitted through ingestion (swallowing), through the lungs (breathing), or by contact with whole, healthy skin. However, under the principle of universal precautions, all blood should be considered infectious, and all skin and mucous membranes should be considered to have possible points of entry for pathogens. Two primary bloodborne pathogens include Hepatitis B and human immunodeficiency virus (HIV)/Acquired Immune Deficiency Syndrome (AIDS).

Potential bloodborne pathogen exposures include:

- Contact with contaminated medical equipment or medical waste or sharps
- Medical emergency response operations such as administering first aid or cardiopulmonary resuscitation (CPR)

To reduce the risk of contracting a bloodborne pathogen, take the following precautions:

- Avoid contact with blood and other bodily fluids.
- Use protective equipment when giving first aid/CPR, such as disposable gloves and breathing barriers (which are provided with the first aid kits).
- Thoroughly wash your hands with soap and water immediately after giving care.

When cleaning up blood or other bodily fluids:

- Clean up the spill immediately or soon as possible after the spill occurs.
- Use disposable gloves and other PPE when cleaning spills.
- Wipe up the spill with paper towels or other absorbent materials.
- After the area has been wiped up, flood the area with a solution of one quarter cup of liquid chlorine bleach to 1 gallon of fresh water and allow it to stand for at least 20 minutes.
- Dispose of the contaminated material used to clean up the spill in a labeled biohazard container.

The SS/SSHO should be notified of any potential contact with blood or bodily fluids resulting from first aid or CPR administered on the job. The SS/SSHO will notify the SHM. Site personnel will be given bloodborne pathogens training.

## **9.6 Exposure Control Plan**

Should an exposure occur, the SHM will direct post-exposure protocol shall include a plan to ensure immediate medical evaluation of exposed individual(s) per current recommendations of the Center for Disease Control (CDC) for human immunodeficiency virus (HIV), Hepatitis B virus (HBV), and Hepatitis C virus (HCV).

Prior to the start of work outside the employee's normal geographical area, TtEC will inform employees of parasitic, bacterial, viral and environmental diseases endemic to the geographical work location (i.e., Lyme disease, West Nile virus, Hantavirus, Histoplasmosis, Rocky-Mountain Spotted Fever, Dengue fever, Malaria, etc.). This information and preventative measures and actions to take upon exposure from potential carriers of these diseases relevant to this project location (e.g., mouse or bird droppings, bites from mosquitos, ticks, etc.) are contained in Section 9.12.4 of this APP.

## **9.7 Automatic External Defibrillator (AED) Program**

Not applicable. An AED is not currently anticipated to be available onsite.

## **9.8 Site Layout Plan**

Approval to stage materials and equipment and set up work areas, as well as access to the site and employee parking will be through the FEAD and NTR/RPM as required. TtEC will provide temporary facilities consisting of an office trailer with a portable generator to supply power, sanitation facilities, and storage containers to secure equipment and materials. A trash dumpster will be provided. A staging area will be established for the staging of equipment and waste containers. TtEC will provide secure locations for TtEC and government property within the staging areas. Some vegetation and tree removal will be required.

A Traffic Plan is being prepared as part of the Work Plan and will be implemented to control and direct traffic. Construction areas will be delineated with high-visibility fencing, barriers, and signage. It is anticipated that access to and from Area 2 will be via Garrison Road. Garrison Road is a narrow gravel road used only by Base maintenance and security (and hunters) and is not a major Base throughway. A level area will be established with stone and fabric for placement of the screening plant (trommel).

TtEC will coordinate with the FEAD and NTR/RPM for required personnel badging and Base access requirements (RAPIDGate) and any Base-related security requirements that need to be followed for TtEC, subcontractors, and vendors and will implement these requirements during fieldwork.

Temporary erosion controls (e.g., silt fence) and dust control measures will be established in construction areas and haul roads where necessary and maintained throughout the project as required to minimize erosion and runoff and control dust generation. A construction entrance will be placed at the construction exit to prevent off-tracking of dirt and mud onto Base roadways. Prior to beginning the mechanical screening process, a lined and bermed staging area or appropriately sized bulk container (e.g., rolloff, etc.) will be established to receive screened cartridges. Screened soil with Dextrose bottle debris will be direct-loaded onto trucks via conveyor system. Drums within the excavation area will be manually placed in the trucks with screened soil waste. Following completion of fieldwork, the site will be restored to original or acceptable conditions. Temporary erosion controls will not be removed until final site stabilization has been achieved.

TtEC personnel and any subcontractors will become familiar with and obey local requirements and security procedures required by the Base as shown in Table 9-2 and Appendix G. TtEC and subcontractor personnel will keep within the limits of the established work area and avenues of ingress and egress and will not enter any restricted areas or secured buildings unless specifically authorized in advance by the FEAD and NTR/RPM for such entry. TtEC will conspicuously mark any equipment and materials in possession for identification purposes.

## **9.9 Access/ Haul Road Plan**

Not applicable.

## 9.10 Hearing Conservation Program

The SS/SSHO will evaluate the workplace for noise hazards initially and regularly during the course of work. The SS/SSHO will conduct noise monitoring whenever there is difficulty in communicating at distances greater than 2 feet, upon worker complaint of excessive noise, or whenever hazardous noise levels are suspected, including when new equipment is placed into service or into new areas.

The assessment of noise hazards will comply with the instrumentation requirements of Section 05.C.03 of EM 385-1-1, the American Conference of Governmental Industrial Hygienists (ACGIH), Threshold Limit Value (TLV) continuous noise exposure standards outlined in Table 5-4 of EM 385-1-1, and the assessment/evaluation will be documented.

- For impact (impulse) noise, personnel exposures may not exceed 140 dBA (unweighted) without effective hearing protection devices.
- For continuous (steady-state) noise, personnel exposures may not exceed 85 dBA without effective hearing protection devices.

During this project, noise hazards are known or expected during the following tasks:

- Operation of construction equipment (excavators, loaders, screening plant etc.)
- Operation of generators unless they are “whisper quiet”
- Operation of chain saws

The SS/SSHO will consider and implement or direct practical engineering or administrative controls when personnel are exposed to continuous (steady-state) sound pressure levels exceeding the levels stated above. Engineering controls may include lubrication, isolation, damping, baffles, or other methods suitable for the situation.

As an administrative control, the SS/SSHO will post noise-hazardous areas (areas where the noise values exceed the above thresholds) and the requirement for hearing protection in these areas. Equipment that is identified as noise-hazardous will be labeled as a noise hazard requiring the use of hearing protection and if the noise hazards of the equipment may affect adjacent workers, the workers will be notified of the noise values and offered hearing protection. If noise exposure to employees cannot be reduced to below the required standard, operating time limits may be imposed.

Hearing protection devices will be provided to affected employees for the attenuation of noise to acceptable levels (less than 85 dBA for continuous (steady-state) noise. Ear insert devices, to include disposable, pre-formed, or custom-molded earplugs, will be fitted to the exposed individual by an individual trained in such fitting and able to recognize the difference between a good and poor fit.

Workers who work in noise hazardous environments greater than 30 days per year on the job will undergo pre-employment and end-of-employment hearing testing.

### **9.11 Respiratory Protection Plan**

Site COPCs such as, chromium, arsenic, mercury, polychlorinated biphenyls (PCBs) [specifically Aroclor-1260], 4,4-DDT that are or may be present in Area 2 soils can become a potential airborne exposure hazard to workers if the soil is dry and fugitive dusts are generated during soil and debris excavation, mechanical screening, loading, and transportation. If soil becomes dry such that dusts are generated, dust controls (water misting) will be performed to control fugitive dust emissions.

Should dust emissions not be well controlled (visible dusts are generated) even with water misting, workers who could be exposed to the dust will be directed by the SSHO or SHM to wear full face air-purifying respirators with P-100 cartridges. When stockpiled or containerized, loads of soil will be appropriately covered.

When occupational exposure levels exceed OSHA Permissible Exposure Limits (PELs) or ACGIH TLVs, and engineering or administrative exposure controls are not feasible to implement, the use of respirators is required. When respirators are required, the SS/SSHO, with input from the SHM, will implement TtEC's Corporate Respiratory Protection Procedure, EHS 5-2 and this Respiratory Protection Plan. This plan will be updated as necessary by the SS/SSHO or SHM. All personnel who wear a respirator will work within the requirements of this Respiratory Protection Plan, under the direct supervision of the SS/SSHO.

All employees who wear a respirator will be trained. This training will occur initially, any time requirements change significantly due to process changes or changes in site-specific operations, and at least annually. Training documentation will be maintained by the SS/SSHO and will be available upon request. Training topics will include the following:

- Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;
- Limitations and capabilities of the respirator;
- How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;
- How to inspect, don, doff, use, and check the seals of the respirator;
- Procedures for maintenance (including cleaning) and storage of the respirator;
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and
- The general requirements of the OSHA respirator standard at 29 CFR 1910.134.

Employees assigned to use respirators, are required to inspect the equipment before and after each use; discard any defective equipment; clean and maintain the equipment according to manufacturers' recommendations; and store their PPE in a clean, secure area (as directed by the SS/SSHO) on the site each day. Specific PPE inspection, cleaning, and maintenance procedures

vary according to the type of equipment being used. Prior to being assigned to their jobs, employees will be informed of these equipment-specific use and maintenance procedures.

A respirator cartridge change-out schedule will be developed by the SS/SSHO in consultation with the SHM based on duration of exposures, relevant safety factors applied, and manufacturer guidelines. The SS/SSHO will maintain the change-out schedule for workers in consultation with the SHM and will document this schedule.

All employees who wear a respirator will undergo medical evaluation to ensure they are fit to wear the selected respirator. This medical evaluation includes a physical examination supervised by a Board-Certified Occupational Medicine Physician. Copies of current medical evaluation and fitness to wear a respirator will be maintained onsite by the SS/SSHO and made available upon request.

All employees who wear a respirator will be qualitatively fit tested to ensure that the selected respirators achieve a proper face piece seal. Fit testing will be performed prior to initial use of the selected respirator, whenever respirator size, make, or model is changed, and at least annually thereafter. Records of fit testing will be maintained onsite by the SS/SSHO and made available upon request.

## **9.12 Health Hazard Control Plan**

The primary physical health hazards associated with this project include:

- Heavy equipment operations, including excavators, loaders, dozer, and haul truck use which can present struck-by and caught-between injuries and noise exposure;
- Trommel (screening plant) us which can present caught-in or between injuries (pinch points), hazardous energy (electrical, mechanical), the potential for flying debris, and noise hazards from rotating parts and conveyor systems.
- Ergonomic hazards associated with movement and placement of heavy and awkward materials or equipment which can also fall or shift and injure or crush a worker if workers are placed in proximity to these activities;
- Trip and fall hazards due to debris and materials on the job site, slippery surfaces, falls into open excavations, or uneven surfaces.
- Working with hand and power tools, including cutting tools such as a chainsaw and wood chipper which can present cuts, strains, sprains, punctures, flying debris, caught-in hazards as well as noise.

Chemical hazards (potential exposure hazards) due to site contaminants that are known to be present in soil and debris that will be removed include heavy metals (arsenic, chromium, and mercury), PCBs, and 4, 4-DDT.

TtEC will use fuel such as diesel and/or gasoline for generator and equipment operation and other hazardous materials such as grease, oil, and spray paint. Use of hazardous materials will be performed in accordance with manufacturer's use instructions, in an outdoor and well-ventilated

area, using the proper PPE as per the MSDS or SDS in accordance with the Hazard Communication Standard.

Biological hazards may be present onsite from biting/stinging insects, venomous and non-venomous snakes, poisonous plants, as well as bloodborne pathogens (e.g., if first aid or CPR are required) can cause rashes, an allergic reaction, poisoning, or transmit potential bloodborne diseases.

Section 9.12.1 addresses chemical hazards and mitigation measures to reduce those hazards, including the monitoring strategy for this project is included in Section 9.12.1.1 below.

Section 9.12.2 addresses site control measures that will be used to control work areas where chemical hazards exist.

Section 9.12.3 addresses contamination avoidance and personnel as well as equipment decontamination and hygiene.

Section 9.12.4 addresses the use of PPE for work activities.

Section 9.12.5 addresses medical surveillance.

Section 9.12.6 addresses biological hazards (e.g., insects, and insect transmitted bloodborne pathogens, poisonous plants, and snakes).

Section 9.62 of this APP identifies and describes physical and classic safety hazards and mitigation measures to reduce those hazards where otherwise not already included elsewhere within this APP.

TtEC will create systems and procedures to prevent and control physical, chemical, biological hazards identified through the risk/hazard analysis. The hierarchy of controls is engineering, administrative, work practice, and PPE. Use of such controls in conjunction with PPE will help reduce the hazard or exposure to the lowest practical level. The basic formula for controlling workplace hazards, in order of preference, includes:

- Eliminating the hazard from the method, material, or the facility
- Abating the hazard by limiting exposure or controlling it at its source
- Training personnel to be aware of the hazard and to follow safe work procedures to avoid it
- Prescribing PPE for protecting employees against the hazard and ensuring they not only use it, but they know how to use it correctly

#### 9.12.1 Chemical Hazards and Controls

Soil constituent concentrations in Area 2 were screened against USEPA Risk-Based Screening Levels for residential soil and/or ecological screening values during sampling and analysis efforts performed during prior field investigation and removal efforts performed by others.

The COPCs for Area 2, including heavy metals (arsenic, chromium [*presumed to be present in hexavalent state as a conservative measure and because the form of chromium in Area 2 has not been confirmed as the less hazardous trivalent form*], and mercury), PCBs [Aroclor-1260], and 4,4-DDT. In addition to the COPCs, several other chemicals are present but at levels that are below project screening values and, thus, are not listed as COPCs. These include 4,4-dichlorodiphenyldichloroethylene (DDE) [4,4-DDE], aluminum, cadmium, cobalt, copper, iron, thallium, and vanadium). Both the COPCs and other chemicals may be adhering to soil particles or contained in debris which can be released as dusts can be inhaled and/or ingested by workers if adequate engineering controls (namely dust control) are not in place and maintained during all soil and debris handling tasks.

The following is a summary of the Area 2 COPCs and their maximum detected concentrations as provided in the EE/CA:

- Arsenic – up to 36.5 milligrams per kilogram (mg/kg)
- Chromium – up to 94.5 mg/kg (trivalent and/or hexavalent form)
- Mercury – up to 1.2 mg/kg
- Aroclor-1260 – up to 0.310 mg/kg
- 4-4-DDT – up to 0.120 mg/kg

In addition to the soil COPCs, the respirator cartridges themselves have been characterized as hazardous waste due to lead and cadmium based on TCLP sample results.

Proper dust control (keeping debris and soil adequately wetted) is critical in preventing exposures to the COCs. In addition, the implementation of site control zones, proper decontamination and hand washing procedures will help to control of potential dermal exposures and the transfer of site contaminants to adjacent areas which could be ingested, inhaled, or contacted by others. When these engineering controls are not enough, PPE will be designated to help control potential exposures.

Lead, arsenic, chromium, cadmium, and mercury are heavy metals that can readily enter the body through accidental ingestion (eating, drinking, and smoking) via contaminated hands, clothing, and surfaces and ingestion or inhalation with dusts. Workers may develop a variety of ailments, such as neurologic effects, gastrointestinal effects, anemia, and kidney disease with exposures to these metals.

The permissible exposure limit (PELs) for PCBs, inorganic metals (arsenic, chromium, mercury), and 4-4-DDT in soil will not be exceeded where there are good dust control measures that limit the amount of visible dust in the air and where contaminant concentrations in surface and subsurface soils and debris are relatively low based on a conservative calculation by a CIH. However, arsenic and chromium in particular and potentially mercury, PCBs, and 4-4-DDT contamination in the soil can exceed PELs if dust is visible. If dusts cannot be adequately controlled (no visible emissions), either work will stop (e.g., extremely dry conditions and heavy

wind) or the SHM and SS/SSHO will direct affected workers to wear full face air-purifying respirators with P-100 cartridges (refer to Section 9.11 Respiratory Protection Plan).

A variety of controls will be implemented during the work tasks to keep worker exposures below the PEL for site COPCs and to minimize the potential for the spread of contaminants, including via dusts (inhalation and ingestion exposures), spills, direct handling of contaminated media (dermal exposures), and off-tracking to adjacent areas as follows:

- During accumulation and handling of soil and debris, including during excavation, loading, transport, mechanical screening operations, if dusts are generated, dust control measures will be implemented to keep visible emissions down. If dusts are generated, the areas will be sprayed/misted with water to minimize visible dust generation such that the spraying/misting does not lead to the create water accumulation or runoff to adjacent areas.
- Whenever possible, workers will position and stage upwind of potential dust generation operations.
- Stockpiles of debris and sediment will be kept within a contained area and will be covered as appropriate on windy dry days, at end of shift, and for erosion control purposes.
- Workers will have access to and will be informed of the requirement to use hand washing stations to wash hands before taking breaks, eating, drinking, or smoking. Hand washing stations will have potable water, soap, and paper towels.
- Workers will doff and stow any soiled PPE in a designated location at the direction of the SS/SSHO and will not wear or bring dirty clothing or soiled work boots into break areas, office areas, or cab of site vehicles and heavy equipment.
- Control zones will be established around the work areas where site COPCs are present as specified in this APP.
- Appropriate level of decontamination for equipment and personnel will be specified by the SS/SSHO and will be performed when leaving contaminated areas to ensure contaminants are not tracked out to adjacent areas.
- Equipment with tires or tracks will not be routed into or through contaminated work zones where contaminated soil is present and could become lodged into tires or tracks.

#### *9.12.1.1 Monitoring Strategy*

The SS/SSHO will visually monitor work areas for visible dust and subcontractor foreman will implement or direct dust controls as appropriate so that no visible dusts are generated. Equipment operators will also be instructed to call for dust suppression if visible dusts are observed. As stated in Section 9.12.1, if visible dusts are generated and not able to be controlled through dust suppression, the SS/SSHO will direct use of respirators and notify the SHM to identify the need for any additional monitoring which will be added to this plan if warranted.

#### 9.12.2 Site Control Measures

This section outlines the means by which TtEC will delineate work zones and use these work zones in conjunction with engineering controls - basic decontamination and hygiene procedures to

prevent the potential spread of contaminants, including off-tracking of soil into previously unaffected areas of the site, and finally, use of PPE.

When there is a potential for coming into contact with or spreading of site contaminants and during sampling activities, a three-zone approach will be used. The three-zone approach will be comprised of an exclusion zone (EZ), a contamination reduction zone (CRZ), and a support zone (SZ). The degree of control and the requirements for establishment and management of these zones will be at direction of the SS/SSHO based on site conditions, the potential for spreading of or contact with contaminants, and activities being performed.

Site control requires the establishment of a regulated area and designated site work zones appropriate to the work task.

To minimize the transfer of contaminants from the site (in areas where this is a concern) and to control access into potentially hazardous areas where work is being performed, project personnel will:

- Schedule operations that use minimum numbers of personnel.
- Establish site work zones around each worksite location as appropriate and post signage.
- Implement appropriate decontamination procedures.
- Keep the client and other affected contractors informed of changing work zones.

#### *9.12.2.1 Exclusion Zone*

EZs will be formed where active work areas and tasks are being performed where entry by unauthorized or uninformed persons could be hazardous or require additional controls. Barricades or cones, along with caution tape, will delineate the EZ.

For EZs that are set up to control chemical exposures or contamination, workers will place contaminated tools and equipment on plastic sheeting (when required) in the EZ to prevent contamination of the surrounding area as required until the tools are appropriately decontaminated and removed from use.

#### *9.12.2.2 Contamination Reduction Zone*

Adjacent to the EZ, the CRZ will serve as a buffer zone to prevent the spread of contamination beyond the work area. Workers will either wrap contaminated tools and equipment with plastic, or workers will decontaminate the equipment and themselves in this area before moving to the next work area. The appropriate level of decontamination will depend upon the work task and whether the tools and/or personnel were in contact with the contaminated sediment and whether any sediment adheres to the worker's PPE or tools. The SS/SSHO will assist in recommending the proper levels of decontamination for work tasks.

### 9.12.2.3 *Support Zone*

The SZ will be arranged considering accessibility, utility availability, wind direction, and line-of-sight to work. Typically, the SZ is located in an upwind direction from the work areas. This is where equipment such as a fire extinguisher, first aid kit, spill kit, hand washing facility and any other appropriate support is located.

### 9.12.3 Personal Hygiene and Decontamination

This section provides decontamination procedures and guidelines for developing site- and activity-specific decontamination procedures.

#### 9.12.3.1 *Responsibilities*

The SS/SSHO is responsible for establishing and maintaining appropriate equipment and personnel decontamination areas and ensuring that subcontractors follow this plan and implement all requirements. The SS/SSHO will ensure that adequate decontamination procedures are identified for tasks and followed by the subcontractor to prevent contamination of individuals or the environment beyond the EZ.

#### 9.12.3.2 *Contamination Avoidance*

Avoiding contamination is the first and best method for preventing the transfer of contamination, including adhering soil and mud to personnel or to non-contaminated or clean areas. Each person involved in site operations must regularly practice the methods, listed below, for contamination reduction.

- Know the limitations of the protective equipment being used.
- Do not sit or lean against anything in a contaminated area and try to limit the need for excessive contact with contaminated media.
- Use the proper tools to safely conduct the job.
- Inspect tools and equipment for gross contamination with sediment and/or mud before tracking out of work area or onto paved roads.

#### 9.12.3.3 *Decontamination*

Decontamination for this project involves physically removing contaminants from equipment and/or PPE. Decontamination, proper PPE-donning and doffing procedures, and management of work zones minimize the chance of cross-contamination from protective clothing to wearer, equipment to personnel, and one area to another.

In general, decontamination will consist of:

- Removing residual materials from tools and equipment or personnel regardless of their source before taking breaks or engaging in hand-to-mouth activities.
- Employing soap and water wash and rinse for hands and, if required, face. Hygiene wipes

may also be used but is not a substitute to hand washing with soap and water.

- Keeping break areas clean. No potentially contaminated PPE or equipment will be permitted in these locations or offices.
- Proper doffing of used and contaminated PPE and proper storage of reusable PPE after decontamination and between uses.

#### *9.12.3.4 Personnel Decontamination Guidance*

It is anticipated that disposable PPE such as gloves, boot covers, and coveralls) will be disposed of after use and there may be a need to use a boot wash or other minor wet decontamination if workers walk in areas of soils or sediments and have mud adhering to PPE or boots.

Personnel decontamination, if wet methods are used will be very minor and will consist of a soap/water wash and rinse for outer reusable protective equipment (boots, gloves, raingear, etc.) if they become contaminated with soil and will be reused rather than discarded. This determination for level of decontamination required will be made by the SS/SSHO. This function will take place in an area adjacent to the site activities in the CRZ within secondary containment. Very minor quantities of soap and water will be used. A hand washing station will be available for workers to wash their hands before leaving the work area or taking breaks. Workers will be instructed to wash hands before going on breaks. Decontamination water, if generated, will be managed in accordance with the Waste Management Plan.

#### *9.12.3.5 Equipment Decontamination Guidance*

It is anticipated that heavy equipment, such as excavator bucket, trommel, and portable hand tools such as shovels will be cleaned of adhering soil (if present) along with any loose debris prior to being moved out of the work area using brooms or wipes. Heavy equipment tires and/or tracks are not anticipated to come into contact with contaminated sediment and wet decontamination methods are not anticipated to be required for equipment at this time. Tracked vehicles will not be operated on roadways. The trommel may require a higher order of decontamination if dry methods are not able to effectively remove soil and debris. If wet decontamination is required, this will be performed over a secondary containment device and liquids will be captured for proper disposal.

The SS/SSHO will be responsible for evaluating equipment both arriving on site and leaving the site. The Equipment Inspection Checklist included in Appendix C will be used to document these inspections. Equipment will only be authorized access or exit with this authorization. Evaluation will consist of a visual inspection to ensure that visible contamination has been effectively removed.

#### 9.12.4 Personal Protective Equipment

PPE for site workers is selected and used based on existing and potential hazards, 29 CFR Section 1910.120 requirements and the hazard assessment.

The following will be provided, used, and maintained in a sanitary and reliable condition: all PPE for eyes, face, head, and extremities; protective clothing; and protective shields and barriers. PPE is required wherever it is necessary by reason of hazards from processes or environment, chemical hazards, or mechanical irritants are encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation, or physical contact. TtEC's written PPE Program is provided in Environmental Health and Safety (EHS) Procedure 5-1.

TtEC is not responsible for providing any PPE, as described herein, to subcontractor employees. Subcontractor employees working on the project must arrive on-site with their individually-assigned PPE, as required for the project and described in this APP and associated AHAs.

The SS/SSHO is responsible for ensuring that all personnel comply with the PPE requirements identified below. In the event that dusts are generated and are unable to be adequately controlled during soil and debris handling tasks and/or exposure monitoring (if required) identifies the need for respiratory protection, the PPE ensemble outlined below will include respiratory protection as specified in the Respiratory Protection Plan.

The SHM has reviewed the applicable work plans and other available information and has evaluated each major work activity to determine the appropriate level of PPE needed for the work. This evaluation included a consideration of potential hazards present; work operations to be performed; potential routes of exposure; concentrations of contaminants present or reasonably expected; characteristics, capabilities, and limitations of PPE; and, any hazards that the PPE may create or exacerbate (e.g., heat stress). Evaluation findings and recommendations for PPE use during specific tasks will be listed in the AHA matrix.

The initial and basic level of PPE selection, as required by 29 CFR 1910.132 (commonly referred to as "Level D"), on the project site includes a hardhat when overhead hazards are present (including when working around heavy equipment or if specified otherwise by client [e.g., facility requirements]), safety glasses with side shields (including appropriate tint of lens), safety boots that comply with American Society for Testing and Materials (ASTM) F2413, leather work gloves (as appropriate per the hazard assessment), standard work clothes (long pants, ¾ length sleeve shirt at a minimum), ear plugs when working around power tools and heavy equipment or other sources of noise, class 2 high visibility vest when working around traffic or heavy equipment, and weather-appropriate clothing.

Additional PPE for various DFOW, activities or work tasks is required as follows:

- During any soil and debris handling tasks where workers may have hand contact with contaminated soil and debris, workers will wear disposable nitrile gloves under leather work gloves. Workers will wear disposable Kleengard™ boot covers (or polyvinyl chloride (PVC) work boots [able to be decontaminated]) when walking in wet or on contaminated soil or debris. If dust or soil can get onto worker's clothing, workers will wear Kleengard™ coveralls.
- PPE for tree felling and vegetation clearing activities is included in Section 9.56.

- Respiratory protection will be worn as required in Section 9.11.

Reasons to upgrade level of protection:

- Known or suspected presence of dermal hazards.
- Occurrence or likely occurrence of gas or vapor emission.
- Change in work task that will increase contact or potential contact with hazardous materials.
- Request of the individual performing the task.

Reasons to downgrade level of protection:

- New information indicating that the situation is less hazardous than was originally thought.
- Change in site condition that decreases the hazard.
- Change in work task that will reduce contact with hazardous materials.

The SS/SSHO will oversee the implementation of the PPE program onsite and will observe workers are trained in use of specific PPE and to ensure proper implementation, including proper donning/doffing and disposal. Used PPE will be managed based on requirements identified in the Waste Management Plan considering the contaminants and concentration of contaminants that are or may have been in contact with the PPE and applicable federal and state regulations. Any time PPE is modified from the plan or initial AHA, the SHM must be contacted. Additional tasks not included in the AHA matrix will also be reviewed by the SS/SSHO and SHM.

#### 9.12.5 Medical Surveillance

TtEC requires that site workers involved in specific tasks participate in a medical surveillance program that meets the requirements of 29 CFR, Part 1910.120(f) and 29 CFR 1926.65(f). The medical surveillance program, managed by the TtEC medical consultant, is certified by the American Board of Preventive Medicine-Occupational Medicine, will be instituted for the following employees:

- The employees who are, or who may be, exposed to contaminant-related Safety and Occupational Health hazards (including hazardous substances or health hazards) at or above the permissible exposure limits, or, if there is no permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year.
- The employees who wear a respirator for 30 days or more a year or as required by 29 CFR Part 1910.134.
- The employees who are injured, become ill, or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation.

A certification of employee (both TtEC and subcontractors as applicable) participation in the medical surveillance program will be appended to this APP prior to beginning work, when all personnel are designated. The certification will be maintained up to date by the SS/SSHO for all personnel (TtEC and Sealaska) required to be under medical surveillance (generally those who will or may be designated to work within the Exclusion Zone (EZ) as defined in Section 9.12.2.1. This certification will be made available to the NTR/RPM upon request. The certification will include the employee's name, date of last examination, and the name of the examining physician(s).

Employees who are expected to participate in on-site activities where they are potentially exposed to health or safety hazards will be required to complete a baseline physical examination.

The workers who must enter an EZ, and/or who meet the criteria listed above, must provide the SS/SSHO with a written opinion from a licensed physician attesting to the employee's fitness for duty at a hazardous waste site. A physician's written opinion of the employee's ability to wear a respirator is also required when there is reasonable possibility that a respirator may be required for site work. The physician's written opinion must be dated within the previous 12-month period, or an alternate time period as determined by the physician, for continued work. The required physician's written opinion will be made available upon request to the NTR/RPM.

TtEC will maintain all medical records in accordance with 29 CFR 1910.1020. At no time will the SS/SSHO maintain the copy of any actual medical records. These records are maintained by the TtEC medical consultant, WorkCare® or subcontractor's equivalent medical consultant.

#### 9.12.6 Biological Hazards

Biological hazards may be encountered at CAX in the form of biting or stinging insects, venomous and non-venomous snakes if present, contact with poisonous plants if they have become established on land if such plants are established, and bloodborne pathogens in the event that first aid/CPR is performed. Workers should anticipate the likelihood of encountering these flora or fauna. Insect bites and insect stings can cause localized swelling, itching, and minor pain that can be handled by first aid treatment. In sensitized individuals, however, effects can be more serious such as anaphylactic shock, which can lead to severe reactions in the circulatory, respiratory, and central nervous system and, in some cases, even death. The SS/SSHO will identify personnel with a known reaction to bites and stings at the pre-job safety orientation meeting. In addition, some insects can spread diseases.

Personnel will not attempt to capture or feed any wild or semi-wild animals such as rats or birds (if present) due to the possibility of a bite or parasitic infestation. Animal and bird droppings often contain mold, fungus, or bacteria that represent a significant respiratory hazard, including lung diseases and allergies. Personnel will not touch such droppings.

#### 9.12.6.1 *Insects*

Insects, including bees, wasps, hornets, spiders, and ticks, may be present at this site making the chance of a bite or sting possible. Some individuals may have a severe allergic reaction to an insect bite or sting that can result in a life threatening condition; any individuals who have been bitten or stung by an insect will notify the SS/SSHO. Field personnel who may have insect allergies are strongly encouraged to provide this information to the SS/SSHO prior to commencing work, and will be instructed to have their prescribed allergy medication on site (including epinephrine pen if applicable). The following is a list of preventive measures:

- Apply insect repellent prior to fieldwork and as often as needed throughout the work shift. Apply N, N -Diethyl- meta -toluamide (DEET) (vapor-active repellent) to any exposed skin surface (except eyes and lips), and apply the permethrin repellent spray to field clothing. Note: Allow the permethrin to dry before using the treated clothing.
- Wear proper protective clothing (work boots, socks and pants).
- Tuck pant leg into socks and wear long-sleeved shirts.
- When walking in vegetated areas, avoid contact with bushes, tall grass, or brush as much as possible.
- Avoid placing bare hands under rocks or loose debris

Mild insect stings or bites should be treated by applying a baking soda paste or ice wrapped in a wet cloth. Bee stingers should be gently scraped off the skin, working from the side of the stinger. The suction device in commercially available snake bite kits can also be used to remove the stinger. If insect bites become red or inflamed or symptoms such as nausea, dizziness, shortness of breath, etc., appear, medical care will be sought immediately. Immediate medical care is essential for persons who are allergic to insect bites/stings. If an allergic person receives a spider bite or insect bite/sting, seek immediate medical attention, keep the victim calm, and check vital signs frequently. Rescue breathing should be given, if necessary, to supply oxygen to the victim. Various spiders may be encountered at the site and many spiders have the potential to bite; however, there are no dangerous spiders of particular concern in the area.

#### 9.12.6.2 *West Nile Virus*

West Nile virus (WNV) encephalitis is a mosquito-borne viral disease that can cause an inflammation of the brain. WNV is transmitted to people by the bite of a mosquito that has become infectious after feeding on a bird infected with the virus. Birds serve as the reservoir hosts of WNV, and the principal vector in the transmission from one bird to another is the mosquito.

Most infections produce no symptoms in people, or symptoms are mild or moderate. Approximately 80 percent of those infected with WNV will show no symptoms. About 20 percent of cases produce mild symptoms including: fever, headache, and body aches, often with skin rash and swollen lymph glands. Less than 1 percent of cases show more severe infections marked by headache, high fever, neck stiffness, muscle weakness, stupor, disorientation, convulsions, paralysis, coma, and, rarely, death. Persons age 50 years or older and immune-compromised individuals are at a higher risk of developing a more severe infection. Symptoms of WNV will

generally last a few days, although even some healthy people report having the illness last for several weeks. The symptoms of severe disease (encephalitis or meningitis) may last several weeks, although neurological effects may be permanent.

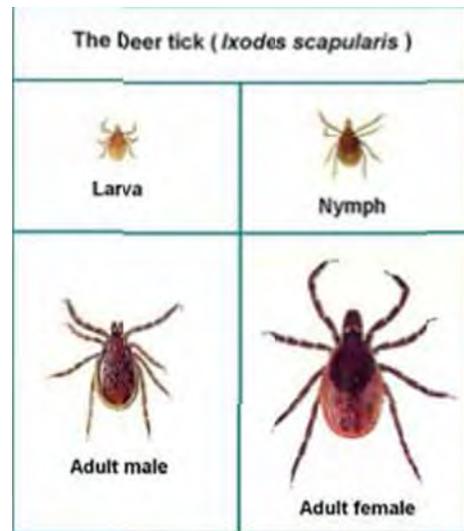
Control measures to prevent contacting WNV include:

- Mosquitoes are most active at dawn and dusk. Limit outdoor activities at those times, when possible.
- Wear long-sleeved shirts and long pants.
- Spray DEET on your skin and permethrin on clothing and work boots.

### 9.12.6.3 Lyme Disease

Lyme disease is caused by an infection from the bite of a deer tick, which is about the size of the head of a pin. During the painless tick bite and following the blood meal, a microorganism (spirochete) may be transmitted into the bloodstream that may lead to Lyme disease. A 24- to 48-hour period is necessary for the tick to feed and become engorged. During this time period, it is unlikely that the tick has regurgitated its stomach contents into the host and therefore, infection is unlikely.

Lyme disease may cause a variety of medical conditions including arthritis, which can be treated successfully if the symptoms are recognized early and medical attention is received. Treatment with antibiotics has been successful in preventing more serious symptoms from developing. The effects of the disease vary from person to person, which often makes it difficult to diagnose. Typically, the incubation period ranges from two days to two weeks. Early signs may include a flu-like illness, an expanding skin rash and joint pain. If left untreated, Lyme disease can cause serious nerve or heart problems as well as a disabling type of arthritis.



Symptoms can include a stiff neck, chills, fever, sore throat, headache, fatigue and joint pain. This flu-like illness is out of season, commonly happening between May and October, when ticks are most active. A large expanding skin rash usually develops around the area of the bite. More than one rash may occur. The rash may feel hot to the touch and may be painful. Rashes vary in size, shape, and color, but often look like a red ring with a clear center. The outer edges expand in size. It's easy to miss the rash and the connection between the rash and a tick bite. The rash develops from three days to as long as a month after the tick bite. Almost one third of those with Lyme disease never get the rash. Joint or muscle pain may be an early sign of Lyme disease. These aches and pains may be easy to confuse with the pain that comes with other types of arthritis. However, unlike many other types of arthritis, this pain seems to move or travel from joint to joint.

Lyme disease can affect the nervous system. Symptoms include stiff neck, severe headache, and fatigue usually linked to meningitis. Symptoms may also include pain and drooping of the muscles on the face, called Bell's palsy. Lyme disease may also mimic symptoms of multiple sclerosis or other types of paralysis. Lyme disease can also cause serious but reversible heart problems, such as irregular heartbeat. Finally, Lyme disease can result in a disabling, chronic type of arthritis that most often affects the knees. Treatment is more difficult and less successful in later stages. Often, the effects of Lyme disease may be confused with other medical problems.

Control measures to prevent contracting Lyme disease include:

- Avoid dense or high brush, when possible.
- Wear light colored clothing.
- Spray DEET on your skin and permethrin on clothing and work boots.
- Tuck pant legs into socks and shirts into gloves, if possible.
- Self/buddy check neck, hairline, groin, and body after working in areas that may contain deer ticks. Shower immediately after returning home from the job site.

If a tick is found biting an individual, the SS/SSHO will be contacted immediately. The tick can be removed by grasping the tick with tweezers as close to the skin as possible, and pulling gently or using a tick removal system (e.g., Pro-Tick, [www.scs-mall.com/store/](http://www.scs-mall.com/store/)). The affected area should then be disinfected with alcohol or similar antiseptic. If personnel feel sick or have signs similar to those above, they will notify the SS/SSHO immediately. Additionally, employees finding engorged ticks on their body will be given a medical examination.

#### *9.12.6.4 Poisonous Plants*

Poison ivy or oak may present in Virginia, though is not known to be present or widespread and is not as likely in developed or maintained areas of the site. The potential for contact with poisonous plants exists when performing surveys or vegetation removal tasks in undeveloped and vegetated areas. Poison ivy can be found as vines on tree trunks or as upright bushes. Poison ivy consists of three leaflets with notched edges. Two leaflets form a pair on opposite sides of the stalk, and the third leaflet stands by itself at the tip. Poison ivy is red in the early spring and turns shiny green later in the spring. Poison ivy has white berries and both poison ivy and oak have red or yellow foliage in the fall of the year.

Contact with poisonous ivy or oak may lead to a skin rash in susceptible individuals. A rash results from a toxin found in the sap; it is extruded from the leaves and contained in the stems and roots. The rash is characterized by reddened, itchy, blistering skin requiring first aid treatment. In the event of contact with one of these plants, immediately wash skin thoroughly with Dawn soap and cool water, Technu or Zanfel, taking care not to touch face or other body parts.

Avoidance of plant/sap contact is the only effective means of preventing the poisoning. A person experiencing symptoms of poisoning should remove contaminated clothing; wash the exposed areas thoroughly with Dawn soap and cool water, taking care not to touch face or other body parts. Apply Technu or Zanfel to wash the affected area, use calamine or other poison ivy lotion if the

rash is mild. Seek medical advice if a severe reaction occurs, or if there is a known history of previous sensitivity. Employees will be trained in the identification of these species and will be advised to wear protective clothing such as gloves and long-sleeved shirts when working conditions permit. Employees should also consider applying barrier lotions (e.g. Ivy Block) to skin that has the potential to contact these species. Alcohol wipes, Dawn liquid soap and Technu can be used to decontaminate skin and reusable clothing to prevent exposure to poison ivy. Gloves should be worn when removing and decontaminating clothing potentially exposed to poison ivy.

#### *9.12.6.5 Snakes*

Several species of snakes in Virginia are known to be venomous. These snakes include the Eastern cottonmouth, Northern copperhead, and the Timber rattlesnake. Numerous harmless snakes also may be present, and though not venomous, could also bite if cornered. If a snake is encountered, slowly and quietly back away from the snake and let it retreat. Avoid placing hands in dark spaces and under materials or debris. Workers performing vegetation removal tasks will wear snake chaps. Do not attempt to move or kill a snake, as certain snakes are protected under state and federal laws. In the event of snakebite, wipe off the skin and notify the SS/SSHO immediately. If the snake is suspected of being one of the venomous varieties or if you do not know whether it is or is not:

- Seek immediate medical attention and safely try to document as much information about the snake as possible (color, markings, size, etc.) and record the time the bite occurred.
- Keep the affected area below heart level to reduce the flow of venom.
- Remove rings or constricting items as the bite area can swell.
- Give the person first aid and treat for possible shock.
- Apply a bandage, wrapped two to four inches above the bite to help slow the venom but not tight enough to cut off the flow of blood.

Do NOT - apply cold compresses, apply a tourniquet, cut into the bite, attempt to suck out the venom, give the person any medications or anything by mouth but water, or raise the site of the bite above the level of the person's heart. Await or transport the person to emergency medical care.

If the snake is determined not to be venomous, apply first aid to avoid infections and contact WorkCare<sup>®</sup> for medical follow up and recommendation to prevent infection.

### **9.13 Hazard Communication Program**

Specific hazardous materials or chemicals that will be brought onto the project site are anticipated to consist primarily of unleaded gasoline, diesel fuel, oil, and grease. When any material or chemical is brought onto the site, a MSDS or SDS must be provided to the SS/SSHO and those who use the material must be familiarized with the hazards and precautions.

A preliminary Hazardous Materials Inventory is included in Appendix F. MSDS and/or SDS will be added and the inventory will be updated when specific product information is available from

the actual material used and manufacturer/supplier data. This inventory, and associated MSDS or SDS will be updated whenever additional hazardous materials to be used onsite become known. This includes all hazardous materials brought onsite by the subcontractors for their operations.

The SSHO will file the MSDSs or SDSs in a notebook that will be available in the field office. The SSHO will review the MSDSs or SDSs with the workers, and this training will be documented on the daily safety meeting form. All workers will have general HAZCOM training that explains how the program is managed at the site and that specifically requires them to notify the SS/SSHO when any new material is brought onto the site.

All containers will be labeled specifying the content and hazards of the material in the container.

#### **9.14 Process Safety Management Program**

Not applicable.

#### **9.15 Lead Compliance Plan**

Not applicable.

#### **9.16 Asbestos Abatement Plan**

Not applicable.

#### **9.17 Radiation Safety Program**

Not applicable.

#### **9.18 Abrasive Blasting Procedures**

Not applicable.

#### **9.19 Heat Stress Monitoring Plan**

There is a potential for heat stress related injuries during the performance of work at CAX from exposure to ambient temperatures and season in which the work is conducted, effects of wind chill, effects of radiant loading, level of work activity, and level of PPE worn during work tasks and other factors, which can add significant heat stress to otherwise routine tasks. TtEC Procedure EHS 4-6 – Temperature Extremes will be followed during work activities.

Heat stress-related problems include heat rash, fainting, heat cramps, heat exhaustion, and heat stroke.

- 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 is characterized by dry skin due to lack of sweating, dry mouth, mental confusion and convulsions.

A person exhibiting signs of heat stress should be removed from the work area and moved to a shaded/cool area immediately. The injured person should be soaked with water and fanned to promote evaporation. Medical attention must be obtained immediately. **EARLY RECOGNITION AND PROMPT TREATMENT OF HEAT STRESS SYMPTOMS, INCLUDING HEAT STROKE, ARE THE ONLY MEANS OF PREVENTING BRAIN DAMAGE OR DEATH.** 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:

- Adjust work schedules.
- SSHO to monitor temperature with a wet bulb globe thermometer (WBGT).
- Modify work/rest schedules according to monitoring requirements.
- Mandate work slowdowns as needed.
- When there is a potential for sunburn, workers will be encouraged to use sunscreen with a sun protection factor of 30 or greater and should wear hats, long sleeve shirts, sunglasses (tinted safety glasses) and other protective attire.
- Perform work during cooler hours of the day, if possible, or at night if adequate lighting can be provided.
- Acclimate workers to heat using a regimen of increasing exposure each day of work.
- Perform physiological monitoring as follows:

If a worker is required to wear semi-impermeable or impermeable clothing (not anticipated for this project), then physiological monitoring shall include:

- a. Heart rate monitoring with a standard of a sustained heart rate in excess of 180 beats per minute (bpm) minus the age of the worker in years, recovery heart rate at one minute after a peak work effort is greater than 120 bpm, or
- b. Monitoring of the core body temperature with a standard of greater than 100.4°F (38.0°C) for unacclimatized workers, and 101.3°F (38.5°C) for acclimated workers.
- c. Workers exceeding the above standards are required to have work/rest regimens and fluid replacement schedules.

If a worker is wearing permeable clothing:

- a. Environmental monitoring or physiological monitoring shall be conducted and work/rest

- regimens established.
- b. Monitoring shall be conducted when temperature exceeds 75°F (24o C) and 55% humidity.
  - c. Use of a WBGT instrument is preferred, however, if a WBGT instrument is not available, and the WBGT cannot be obtained from local weather stations, then Figure 6-1 in EM 385-1-1 - the Approximate WBGT Temperature Chart, should be used to approximate the WBGT.
  - d. If Figure 6-1 is used, direct radiant sun exposure, air velocity, temperature, and humidity and adjustment factors for various work clothing should be taken into consideration.

In addition, the following will be performed:

- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.
- Use buddy system so workers can help monitor each other and alert other workers to changes and symptoms of heat stress.
- 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 enough water will be consumed to replace lost sweat.
- Provide potable drinking water to employees.
- When heavy sweating occurs, encourage the worker to drink more. 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.

The following strategies may be useful:

- Maintain water temperature at 50° to 60 degrees Fahrenheit (°F) (10°-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 a cup or two 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.
- Cooling vests will be provided as necessary when impermeable clothing is worn.
- Avoid intake of alcoholic and caffeinated beverages.
- Provide shaded rest areas.

Early symptoms of heat stress related problems may include:

- Decline in task performance

- Lack of coordination
- Decline in alertness
- Unsteady walk
- Excessive fatigue
- Muscle cramps
- Dizziness

In summary, proper training and preventive measures will aid in averting loss of worker productivity and serious illness from heat stress. 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, maintain worker's body fluids and electrolytes at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluids 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) of weight loss. The normal thirst mechanism is not sensitive enough to ensure that enough water will be consumed to replace lost sweat.

If a worker experiences heat stress, medical attention will be sought. Workers who have more than one heat-related episode within a month require a doctor's written release prior to returning to exposures in a potential heat stress environment.

## **9.20 Cold Stress Monitoring Plan**

Cold weather in Virginia could present the potential for cold stress during spring, fall, and especially winter months and temperatures may drop below freezing. As a result of the potential for freezing rain, snow, sleet and wet weather, with the added potential for wind chill, cold stress will be discussed as follows:

- Exposure to low temperatures presents a risk to employee safety and health through the direct effect of the low temperature on the body and collateral effects such as slipping on ice, decreased dexterity, and reduced dependability of equipment.
- Work conducted in the winter months can become a hazard for field personnel due to cold exposure. The personnel must exercise increased care when working in cold environments to prevent accidents that may result from the cold. The effects of cold exposure include frostbite and hypothermia. Wind increases the impact of cold on a person's body. Systemic cold exposure is referred to as hypothermia. Local cold exposure is generally labeled frostbite. Recognition of the symptoms of cold-related illnesses will be discussed during the health and safety briefing conducted prior to the onset of site activities.
- Hypothermia is a life-threatening condition in which the core body temperature falls below 95°F. Hypothermia can occur at temperatures above freezing particularly when the skin or clothing becomes wet. During exposure to cold, maximum shivering occurs when the core temperature falls to 95°F. As hypothermia progresses, depression of the central nervous system becomes increasingly more severe (Table 9-3). This accounts for the progressive signs and symptoms ranging from sluggishness and slurred speech to disorientation and eventually unconsciousness.

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 could be a concern in Virginia during this field effort if the fieldwork is conducted in the winter months. 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:

- Frostnip – 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.

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 contribute to the prevention of hypothermia and frostbite. Recognizing the early signs and symptoms of cold stress can help prevent serious injury. Thus, workers will be trained to recognize the symptoms of hypothermia and frostbite and have appropriate first aid instruction. When the air temperature is below 50°F, the SSHO will inform workers of the proper clothing requirements and any work practices that are in effect to reduce cold exposure.

- Cold injuries and illnesses recognition and prevention measures will be emphasized during daily safety briefings when the potential for cold injuries and illnesses exists.
- Work will cease under unusually hazardous conditions.
- Phenothiazine (a sedative) and beta blocker drug use will be prohibited.
- A heated area will be available on site.
- Temperature will be recorded daily on site.
- Warm beverages will be available on site.
- Air temperature and wind speed will be taken by the SSHO at least every 4 hours when the temperature drops below 20°F (-6°C) and wind speed exceeds 5 mph (8 kph) or broadcasted wind chill factors may be used if the reading is within 10 miles of the location. Refer to Figure 6-1 in EM 385-1-1 for chart.

The SSHO will establish a work/rest schedule based upon worker monitoring. At the first sign of uncontrollable shivering, the worker will be rested in a heated shelter. Work will be stopped when the air temperature reaches 0°F. Warming shelters will be made available when the wind chill drops below 10 degrees F.

Workers will be encouraged to layer clothing when air temperature is below 50°F. Clothing that has a high insulation value will be worn under protective garments. Insulated gloves will be worn when the wind chill index is below 32°F (i.e., air temp 50°F and wind speed > 20 miles per hour [mph] or air temp 40°F and wind speed > 5 mph). Insulating dry clothes will be available.

## **9.21 Indoor Air Quality Management**

If any indoor space (e.g., office trailer) requires painting, roof repairs, carpet installation or repair or other activities that use chemicals or solvents, the work will be conducted after normal business hours to prevent exposure to occupants. If air handling systems are in place, they will be cleaned and maintained properly and will not be modified or blocked.

If employees smoke, the designated smoking area will be at least 25 feet from any building entrance and local ordinances will be reviewed to determine if more stringent requirements apply. Use of tobacco (cigarettes and cigars or pipes) and smokeless (vapor) devices are prohibited in TtEC and Department of Defense vehicles, and work buildings.

## **9.22 Mold Remediation Plan**

Not applicable.

## **9.23 Chromium (VI) Exposure Evaluation**

Not applicable.

## **9.24 Crystalline Silica Evaluation**

Not applicable.

## **9.25 Lighting Plan for Night Operations**

Not applicable.

## **9.26 Traffic Control Plan**

A Traffic Control Plan will be prepared as part of the Work Plan, including, if required, the elements of the DOT Federal Highway Administrations Manual on Uniform Traffic Control Devices and Section 08.C of EM 385-1-1.

## **9.27 Fire Prevention Plan**

Fire prevention and protection measures require preplanning. Fire extinguisher types, capacity, and location are shown in Table 9-1. The SS/SSHO will inspect fire extinguishers monthly and servicing will be performed by a qualified service provider on an annual basis.

Employees will follow safe work practices, including proper storage of flammable and combustible liquids, and the following rules:

- Smoking is permitted only in those areas designated specifically by the PM or SS/SSHO and FEAD.
- Refueling will be performed only in a designated area with a 60: BC fire extinguisher

present.

- Refueling will be performed only in a designated area that is free of dry surface vegetation. The area must have spill control materials available nearby.
- Equipment must be refueled with the equipment turned off (except under special circumstances as required by an operator’s manual). Allow the equipment to cool down prior to refueling.
- No refueling will be performed unattended.
- Latching on fueling hoses is prohibited. Smoking is prohibited in any area where refueling is performed.
- Compressed gases, if present, will be secured only in an upright position. Flammable gases will be stored separately from oxygen gas cylinders. Any flammable cylinder storage areas (if any) will be posted as “FLAMMABLE, NO SMOKING.”
- All sources of ignition shall be prohibited within 50 feet of operations with a potential fire hazard. The area shall be conspicuously and legibly posted “NO SMOKING, MATCHES, or OPEN FLAME.”
- Flammable liquids will be stored in an approved storage cabinet in UL-listed metal containers or National Fire Protection Association-rated fuel tank, hoses, and nozzles.
- Fuel tanks will have a means of preventing overfilling (visual or other indicator of fuel level).
- Non-sparking and explosion-proof equipment and tools will be used whenever the potential for ignition of flammable or explosive gases, vapors, or liquids exists.
- Good housekeeping will be maintained such that debris and materials do not accumulate in work areas and pose a fire hazard.
- Self-closing, Underwriter’s Laboratory labeled or metal containers will be used to collect waste that is saturated with flammable or combustible liquids (e.g., oily rags).

Hot work may be required (for instance if grinding or cutting or welding is performed) and no hot work is permitted until it is determined that the area is gas-free and that there are no flammable or combustible materials stored within 50 feet of the work area. The TtEC Hot Work Procedure, EHS 6-5 and its’ permit system will be implemented if any work is considered to be hot work, including fire watch. In addition, if hot work will be performed, TtEC will obtain a Hot Work Permit from the Base Fire Marshal by calling (757)-613-8194 as specified in Appendix G.

### **9.28 Wild Land Fire Management Plan**

Not applicable.

### **9.29 Arc Flash Hazard Analysis**

Not applicable.

### **9.30 Assured Equipment Grounding Control Program**

Not applicable.

### **9.31 Hazardous Energy Control Program and Procedures**

TtEC Procedure EHS 6-4, Lockout/Tagout, establishes the Control of Hazardous Energy Program. This program applies to all TtEC operations, except as follows:

- Work on cord- and plug-connected electrical equipment where the plug is under the control of the employee performing the work
- Hot tap operations
- Work involving minor changes and adjustments to equipment during routine operations (such as small tooling adjustments)

Details on the methods used to control hazardous energy for a defined task or specific piece of equipment must be documented in the AHA for that task. The SS/SSHO, with assistance of subcontractor personnel, will ensure appropriate Lockout/Tagout procedures are evaluated and included within an AHA if hazardous energy sources are present and maintenance or servicing is required where workers could be exposed to hazardous energy (e.g., trommel screening plant maintenance or dislodging of stuck debris). The specific control of hazardous energy procedures required will be based on the manufacturer's instructions. A copy of the equipment user's manual will be available onsite and referenced for this evaluation. The approved AHA will be reviewed with workers prior to performing the task so that workers understand the need for Lockout/Tagout as it relates to use of this equipment and how it is to be implemented. Energy may be present in the form of electrical, pneumatic, hydraulic, and kinetic forms and the specific Lockout/Tagout means and methods must be suitable to the hazard presented by the equipment and the activities that will be performed.

TtEC and any subcontractors must fully coordinate all hazardous energy control activities throughout the planning and implementation of work, including the AHA process. If TtEC and any subcontractors work will be at a government controlled or operated facility, TtEC and the subcontractor will coordinate any hazardous energy control activities with the client for acceptance (when required), including submittal of the AHA for approval.

### **9.32 Standard Pre-Lift Plan – Load Handling Equipment**

No cranes will be used on the project; however construction equipment might be used to perform hoisting (excavator bucket properly equipped with associated rigging) if the need for such lifts is identified (currently not planned).

All lifts must be planned to avoid situations where the operator cannot maintain safe control of the lift. A written standard pre-lift plan (SLP) will be prepared for every lift or series of lifts (if duty cycle or routine lifts are being performed) by the CP (e.g., qualified rigger for the lift). The SLP will be developed, reviewed and accepted by all personnel involved in the lift. The SLP will be maintained on the load handling equipment (LHE) for the current lift(s) being made. Historical SLPs shall be maintained for a minimum of 3 months. This plan should include lifts or hoisting by means of construction equipment (e.g., excavator bucket or loader with eye for rigging attachment).

The following provides basic requirements for hoisting, including hoisting by mechanical equipment. Each SLP will be prepared separately from this APP (and associated AHA) for the type of lift handling equipment used and type of loads that will be lifted. Section 16 of EM 385-1-1 will be reviewed and the requirements incorporated into each SLP for the type of lift and equipment being used for the lift.

### 9.32.1 General Requirements for Hoisting

Hoisting tasks will be suspended during excessive inclement weather at the discretion of the CP. Equipment manufacturer's recommendations will be followed to determine ability to perform safe hoisting operations based on wind calculations. Hoisting operations will halt in wind speeds of 20 miles per hour or greater.

All rigging used in hoisting operations will be inspected by the CP each day before use. Defective equipment or equipment showing excessive wear will be taken out of service. Rigging equipment will be used in accordance with the equipment manufacturer's instructions and will not be used for loads in excess of rated capacity. Rigging will be properly stored and maintained when not in use. Only positive latching devices will be used to secure the load and rigging. Design, testing, and capacities of fabricated lifting devices will be maintained on site.

All hoisting equipment documentation, including inspection, training, certification records, and load data will be maintained on site. If any unsafe conditions or faulty equipment are detected, the equipment will not be used until the problem is resolved and satisfactory inspections have been completed. Daily pre-use inspections will be performed each day hoisting operations by the CP. Inspections will include all functioning parts and systems, mechanical structures, and site conditions associated with hoisting operations.

Hazards during hoisting operations include being struck by loads during movement, being crushed underneath loads during placement, striking of overhead electrical lines or structures, and being cut or pinched while handling loads or its rigging. Other hazards could include equipment rollover or boom collapse due to side loading of the boom. Controls that will be used to mitigate hazards will include the following:

- Implementation of the above requirements for equipment and personnel performing hoisting operations.
- Equipment load charts will be used to plan picks based on boom configuration.
- Only authorized and designated CPs will be involved in hoisting and rigging operations and planning. Personnel involved in hoisting will use standard signal systems for communication during operations. The equipment operator and rigger will have the authority to stop or suspend work if there is a safety concern related to the hoisting operation. A signal person will be used during all hoisting operations and is the only person directly communicating with the equipment operator.
- Personnel will not be allowed to enter the swing radius of the heavy equipment while equipment is in motion. When rigging and unrigging a load, whenever possible, all heavy

equipment and rigging devices will be grounded. If grounding is not possible, all loads including the rigging devices will be lowered to the extent possible, all motion will be stopped, and eye contact will be made between the rigger and operator before attempting to unsecure the rigging.

- A guide rope will be attached to the load to allow positioning without requiring personnel in the vicinity of the placement location.
- Appropriate hand protection such as leather work gloves will be worn while handling the load, the guide rope, and the rigging, to protect against rope burns, cuts, scrapes, and pinch points.
- Prior to performing hoisting operations, the work area will be inspected and evaluated for hazards including overhead obstacles or power lines and unstable surface conditions. Hoisting operations will only be performed if adequate space is available for maneuvering and on stable ground surfaces.
- LHE operations will halt if weather causes icing of the LHE, reduced visibility, winds at 20 miles per hour or greater that present safety hazard, and visible lighting within 10 miles of the site.

#### 9.32.2 Hoisting by Mechanical Equipment

Hoisting operations performed using on-site hydraulic excavators or loaders will only be by equipment and operators meeting the requirements of this section. If manufacturer procedures for lifting and transport of hoisted loads are unavailable or not specified, the equipment will not be used for hoisting.

If hoisting and rigging using mechanical equipment (excavator/loader, etc.) will be performed on this project, an AHA will be prepared as part of the SLP and will be followed when hoisting and rigging is used. The requirements of EM 385 1-1 (USACE 2011), Section 16.S –Hydraulic Excavators, Wheel/Track/Backhoe Loaders Used to Transport or Hoist Loads with Rigging, will be incorporated into the AHA in accordance with Section 16.S.03.a. The AHA will include the following:

- Written proof of qualifications of equipment operators, riggers, and others involved in the operations
- Operational testing performed as per EM 385 1-1 Section 16.S.03.b
- Proper operating procedures in accordance with the equipment manufacturer’s operating manual
- Proper use and on-site availability of manufacturer’s load rating capacities or charts
- Proper use of rigging, including positive latching devices to secure the load and rigging
- Inspection of rigging
- Use of tag lines to control the load
- Adequate communications
- Establishment of a sufficient swing radius (equipment, rigging, and load)
- Stability of surfaces beneath the hydraulic excavating equipment

Heavy equipment used for hoisting will be certified for the application by the equipment manufacturer and will be selected based on capacity to meet the load requirements of the project. Before heavy equipment intended to be used for hoisting operations is used, it will be inspected, tested, and certified by a CP who is named by the PM (may be TtEC or subcontractor) to be in accordance with the manufacturer's recommendations for use. An operational test with the selected hydraulic excavating equipment will be performed in the presence of the government-designated authority (if requested). Heavy equipment used for hoisting operations will be supplied and operated in accordance with equipment operations manuals, guides, procedures/instructions, and load charts.

Operational testing will be performed using a load equivalent to the maximum anticipated load to be lifted by each piece of equipment during the course to the project. Details of the testing and results will be documented.

### **9.33 Critical Lift Plan – Load Handling Equipment**

Not applicable.

### **9.34 Naval Architectural Analysis – Load Handling Equipment (Floating)**

Not applicable.

### **9.35 Floating Plant Inspection and Certification**

Not applicable.

### **9.36 Severe Weather Plan for Marine Activities**

Not applicable.

### **9.37 Emergency Plan for Marine Activities**

Not applicable.

### **9.38 Man Overboard/ Abandon Ship Procedures**

Not applicable.

### **9.39 Float Plan for Launches, Motorboats, and Skiffs**

Not applicable. .

### **9.40 Fall Protection and Prevention Plan**

Workers will not to climb onto the top of a work trailer, shipping container, heavy equipment boom, or any other platform or position within 6 feet of a slope edge (excavation edge) that does not have proper guard rails and ladders or that exposes them to a potential fall of 6 feet or more

without adequate fall protection in place. The SS/SSHO will evaluate whether any fall hazards are present at the site and ensure appropriate guards are in place to prevent worker exposure to falls during work tasks.

If workers could be exposed to fall hazards of 6 feet or greater, either a standard guardrail systems as per Section 21 of EM 385 1-1 will be put into place where or workers will wear appropriate fall protection. If fall protection will be required for any work task (currently not anticipated to be required), the fall protection CP (to be listed in AHA should the need arise) will develop and submit and implement onsite, a Site-Specific Fall Protection and Prevention Plan in accordance with Section 21.D of EM 385 1-1 which will be added to this APP by FCR. This plan shall include, in detail, the specific practices, equipment and methods used to protect workers from falling to lower levels. The plan will be updated as conditions change and at least every 6 months. Fall protection requirements and CP designation will also be incorporated into the task AHA.

#### **9.41 Demolition/ Renovation Plan (to include engineering survey)**

Not applicable.

#### **9.42 Rope Access Work Plan**

Not applicable.

#### **9.43 Excavation/ Trenching Plan**

Excavation depth at Area 2 is anticipated to be up to six feet bgs in the majority of the excavation and up to nine feet bgs in target areas within the same location. The class of soil is anticipated to be Class C as the areas are comprised of fill material. No entry into any excavation that is greater than 4 feet in depth will be performed for any reason and sampling activities can be conducted without entry by the sampling team.

Excavations will be performed using a medium or large sized excavator. All excavation work will be conducted in accordance with OSHA excavation regulations as described in 29 CFR 1926.651, Section 25 of EM 385-1-1, and TtEC Excavation and Trenching Procedure, EHS 6-3. Dig permits will be obtained prior to excavation through the FEAD and NTR/RPM. A utility search will be conducted in accordance with TtEC Corporate Procedure EHS 3-15, including National One Call (811) and private utility locates to verify and mark presence of underground utilities prior to beginning excavation.

Excavations that are greater than 4 feet in depth are considered a confined space (see Section 9.36). Workers are not allowed to enter any excavation that is deeper than 4 feet to perform the work. 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 CP reveals conditions that may result in cave-ins. The need for protective systems is not currently anticipated to be required (neither for worker protection, nor for sidewall stabilization. Protective systems, if required by change in this plan, will be designed by a QP. Sidewalls will be sloped no steeper than 0.75 Horizontal to 1 Vertical.

There is no anticipated need for shoring systems to be put into place and there are no foundations in the areas that could become underpinned.

Excavation safety will be addressed in an AHA and as outlined in this section. If the excavation depth of the design changes, the plan will be evaluated and updated as necessary to include any additional requirements that must be met.

In addition, workers will not work on potentially unstable slopes or be downslope when excavation activities are performed. Workers will not walk on slopes that are greater than 45 degrees.

The following are additional considerations for conducting excavations:

- Overhead power lines or other overhead hazards that the excavator bucket or boom could contact or come within 15 feet of (more distance for higher voltages), will be disconnected through contact with the utility provider. The SS/SSHO will verify power disconnects. Trucks and bins receiving or delivering soil must also consider proximity to overhead utility lines so that truck bed and boom of loader/excavator does not get within minimum distances.
- Air lances, shovels, or other non-intrusive methods may be used to dig an excavation to ensure underlying utilities are not damaged if such utilities are present. Utility lines that traverse an excavation may be shielded and/or supported, as necessary.
- Inspections will be performed by the CP daily on all excavations, adjacent areas, and protective systems (if used). The checklist provided in EHS Procedure 6-3 or equivalent will be used.
- The excavation will be barricaded or backfilled when unattended for worker protection as well as public protection as required in EM 385-1-1, Section 25.
- Spoil piles will be placed a minimum of 2 feet (3 feet whenever possible) away from the excavation sidewalls.
- Equipment will not operate within 2 feet of the edge of an excavation. Berms and spotters will be provided at excavation perimeters to stop trucks backing too close to the excavation edge when trucks are loaded with soil or when dumping clean fill for use in backfilling.
- Workers will not need to cross over open excavations; workers will be able to go around an open excavation to access other areas around the perimeter.
- If workers can come within 6 feet of a vertical excavation sidewall that is 6 feet deep or more, barricades (fence, standard barricade system, etc.) will be provided 6 feet back from the excavation edge or a Fall Protection Plan and AHA will be developed by a CP (reviewed by SHM) and workers will wear approved fall protection.

#### 9.43.1 Identification, Duties, and Training of the Competent Person

Unless otherwise designated in an AHA, the SS/SSHO assigned to the project will be the excavation competent person and will be designated as such by the PM. The SS/SSHO, as the CP (or other CP if assigned) as the competent person, has the ability to recognize hazards associated

with conducting excavations, and is fully authorized to take immediate corrective actions to ensure the safety of personnel and property.

CPs will 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 CP 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 29 CFR 1926.652
- Uses, limitations, and specifications of protective systems in accordance with 29 CFR 1926.652

Duties of the CP:

- The CP will provide site personnel with training on site-specific excavation requirements as outlined in this plan, the AHA, and the excavation design documents.
- The CP will be on site daily. The CP will complete the checklists and reports as required in EHS Procedure 6-3.
- The CP will ensure that in addition to the initial utility locate on the site maps, a physical locate survey is performed and the site is marked out in accordance with Procedure EHS 3-15.
- The CP will ensure that if the design changes and deeper excavations are required or the need for shoring systems is identified by a QP, that this plan be updated accordingly and approved by the SHM and submitted to the Navy for review.
- Inspections will be repeated after each rain event, and often enough to detect conditions that may increase the hazards.
- Evaluating an excavation for hazards and authorizing any entry into an excavation by personnel to conduct a task as per this plan if the need for entry arises (currently limited to excavations less than 4 feet in depth only, only with CP authorization).

#### **9.44 Fire Prevention and Protection Plan for Underground Construction**

Not applicable.

#### **9.45 Compressed Air Work Plan for Underground Construction**

Not applicable.

#### **9.46 Erection and Removal Plan for Formwork and Shoring**

Not applicable.

**9.47 Precast Concrete Plan**

Not applicable.

**9.48 Lift-Slab Plans**

Not applicable.

**9.49 Masonry Bracing Plan**

Not applicable.

**9.50 Steel Erection Plan**

Not applicable.

**9.51 Explosives Safety Site Plan**

Not applicable.

**9.52 Blasting Plan**

Not applicable.

**9.53 Dive Operations Plan**

Not applicable.

**9.54 Safe Practices Manual for Diving Activities**

Not applicable.

**9.55 Emergency Management Plan for Diving**

Not applicable.

**9.56 Tree Felling and Maintenance Program**

Sealaska will perform tree felling operations as necessary to provide safe access to and within work areas. Grubbing (removal of root ball) will be performed only if required.

Tree felling activities must be performed in accordance with a Tree Felling and Maintenance Program that has been developed by/under the direction of a qualified tree worker and in accordance with references included with Section 31 of EM 385-1-1. Sealaska will provide qualified and experienced tree workers to perform tree felling tasks and will submit their Tree Felling and Maintenance Program to TtEC for submittal to the NTR/RPM.

For this project, there will be no tree climbing performed and the use of elevating aerial work platforms is not anticipated to be required.

Sealaska will provide qualified and experienced tree workers to perform tree felling tasks and will submit their Tree Felling and Maintenance Program to TtEC for submittal to the NTR/RPM.

The following are general requirements that must be met for tree felling operations; which must be evaluated carefully on a site- and tree-specific basis:

- A qualified tree worker shall make a visual inspection to determine whether an electrical hazard exists before performing any work in or on a tree.
  - If electrical lines or equipment cannot be safely avoided, arrangements shall be made with the power company to mitigate the electrical hazard. Mitigation options should include de-energizing, testing, isolating and grounding the electrical conductors by the power company as well as all safe OSHA-compliant and practical work methods. Additional requirements apply (see Section 31.A.03) if electrical equipment or hazards are present and must be properly evaluated in the AHA and this plan.
- Tree trimming equipment must be inspected, maintained, repaired, and used in accordance with Manufacturers' instructions. Operations manual from the manufacturer must be available onsite.
- Employees shall be instructed in the safe and proper use of all equipment provided to them.
- A hardhat and eye protection (safety glasses) should be worn for all tree maintenance and removal operations and a mesh face shield must be worn if flying debris is generated (wood chips, sawdust). When chainsaws are used, leather chaps must be worn and leather work gloves must be worn.
- Hearing protection must be provided when using chainsaws.
- Prior to felling operations, the qualified tree felling employee will consider the associated hazards that may be present:
  - Tree size (e.g., able to fit in landing zone);
  - Selected direction of fall;
  - Felling path obstacles to avoid or clear;
  - Vines or interlocking limbs;
  - Species and shape of tree;
  - Lean of tree;
  - Loose limbs, hangers, broken tops, chunks, or other overhead material;
  - Wind force and direction;
  - Decay, cavities, or weak spots throughout the tree;
  - Location of any electrical conductors or other wires;
  - Tree cables, bracing, lightning protection, or other tree hardware;
  - Size and terrain characteristics or limitations of work area;
  - Potential for flying debris from tree impact;
  - Adequate retreat path;
  - Evidence of bees or wildlife habitation in tree;
  - Poisonous plants, water hazards;

- Ability to control access to work site;
- Authority to remove tree;
- Quality of wood fiber in hinge area;
- Root mass stability;
- Ice or snow load;
- Throw-back or bounce-back potential;
- Potential for spring poles;
- Lodged trees or dead snags in area;
- Access to tools or resources required for task;
- Lightning damage;
- Barber chair potential;
- Foreign objects, nails, wire fence, concrete, etc. in the tree.
- Prior to felling operations, the work area shall be cleared to permit safe working conditions and an escape route shall be planned. Workers shall ensure that structures are evacuated where trimming and felling operations are in close proximity.
- Felling paths shall be at least twice the distance as the height of the tree (due to limbs and debris being thrown after hitting the ground. Where this distance cannot be maintained, limbing may be required. Power lines may also need to be dropped or de-energized.
- Each worker shall be instructed as to exactly what he/she is to do. All workers not directly involved in the operation shall be kept clear of the work area.
- Before starting to cut, the chainsaw operator shall be sure of his footing and must clear away brush, fallen trees, and other materials that might interfere with cutting operations.
- A notch and back-cut shall be used in felling trees over 5 in (12.7 cm) in diameter (measured at breast height). No tree shall be felled by “slicing” or “ripping” cuts.
- The two cuts that form the notch shall meet at a point called the apex, and shall not cross that point or go beyond the point where they meet.
  - The notch cut used shall be a conventional notch, an open-face notch, or a Humboldt notch.
  - Notches shall be 45 degrees or greater and large enough to guide the fall of the tree or trunk.
  - Notch depth should not exceed one-third the diameter of the tree. The hinge width should be 80 percent of the tree’s diameter, as measured at the hinge.
  - Saw cuts made to form the notch and back cut shall leave suitable amounts of hinge wood to adequately control the directional fall of the tree.
  - With a conventional notch or Humboldt notch, the back cut shall be 1 to 2 in (2.5 to 5 cm) above the apex of the notch to provide an adequate platform to prevent kickback of the tree or trunk. With an open-face notch (greater than 70 degrees), the back cut should be at the same level as the apex of the notch.
- If sections of the tree are to be removed, sections shall be limited in lengths to one-third of the distance to the nearest structure [e.g. If the tree is 30 ft (9 m) from the structure, sections shall be no more than 10 ft (3m)].
- The chainsaw operator shall work from the uphill side whenever possible. Tag lines may be used to help guide the direction of the fall provided the workers on the tag line are well clear of the fall path, such as twice the distance of the fall area.

- Just before the tree of limb is ready to fall, an audible warning shall be given to all those in the area. All persons shall be safely out of range when the tree falls.
- If there is danger that the trees being felled may fall in the wrong direction or damage property, wedges, block and tackle, rope, or wire cable (except when an electrical hazard exists) shall be used. All limbs shall be removed from trees to a height and width sufficient to allow the tree to fall clear of any wires and other objects in the vicinity.
- Special precautions shall be taken when roping rotten or split trees due to the potential for falling in an unexpected direction even though the cut is made on the proper side.

Chipping and mulching of small branches and vegetation will be performed onsite using a wood chipper. The precautions below for chipping operations must be included within an AHA for this operation, including requirements based on manufacturer's instruction for control of hazardous energy in the event debris becomes stuck. The AHA must address operations as specified in Section 31.D (Brush Removal and Chipping) in EM 385-1-1 specific to the type of chipper used, which are summarized at the end of this section.

Brush removal will be performed as follows (additional hazards may need to be evaluated):

- Brush and logs shall not be allowed to create a hazard at the work site.
- If logs are stacked on-site, log stops or other means must be provided to prevent logs from shifting where they could roll or injury a worker.
- Do not walk in or on brush piles or log stacks.
- Use mechanical means (appropriate sized and equipped construction equipment to move and stack logs and brush.
- Chipping operations will be included in an AHA for the task.

When using power saws (e.g., chainsaws), the following apply:

- The engine shall be started and operated only when all co-workers are clear of the saw and then in accordance with the manufacturer's recommendations and instructions.
- The operator will shut off the saw when carrying it over slippery surfaces, through heavy brush, and when adjacent to personnel. The saw may be carried running (idle speed with the brake set) for short distances (less than 50 ft (15.2 m)) as long as it is carried to prevent contact with the chain or muffler.
- All saws shall be equipped with a clutch, chain brake (gas only), throttle trigger latch, stop switch, rear hand guard, chain catcher, vibration damper, spark arrestor, and muffler.
- Chainsaw chains shall be kept sharp and properly adjusted.
- Chainsaws will not be fueled while running, while hot, or near an open flame.
- Saws will not be started within 10 ft (3 m) of a fuel container.
- The operator will hold the saw with both hands during all cutting operations.
- A chainsaw must never be used to cut above the operators' shoulder height.
- Wedges and chisels shall be properly pointed and tempered.
- Only wood, plastic, or soft metal wedges shall be used with power saws.
- Gas-powered chainsaws shall be equipped with a control that will return the saw to idling

speed when released.

Brush chipping operations will be as follows:

- Rotary drum and disk-type tree or brush chippers not equipped with a mechanical infeed system shall be equipped with an in-feed hopper not less than 85 in (2.2 m) (the sum of the horizontal distance from the chipper blade out along the center of the chute to the end of the chute and the vertical distance from the chute down to the ground).
- Rotary drum and disk-type tree or brush chippers not equipped with a mechanical infeed system shall have a flexible anti-kickback device installed in the in-feed hopper for the purpose of protecting the operator and other persons in the machine area from the hazards of flying chips and debris.
- Disk-type tree or brush chippers equipped with a mechanical in-feed system shall have a quick stop and reversing device on the in-feed. The activating mechanism for the quick stop and reversing device shall be located across from the top, along each side of, and as close as possible to the feed end of the in-feed hopper and within easy reach of the operator.
- The feed chute or feed table of a chipper shall have sufficient height on its side members to prevent operator contact with the blades or knives during normal operation.
- Brush chippers shall be equipped with a discharge chute of sufficient length or design to prevent contact with the blade.
- Brush chippers shall be equipped with a locking device on the ignition system to prevent unauthorized starting of the equipment.
- Brush chipper cutting bars and blades shall be kept sharp, properly adjusted, and otherwise maintained in accordance with the manufacturer's recommendations.
- Trailer brush chippers detached from trucks shall be chocked or otherwise secured.
- All workers feeding brush into chippers shall wear eye protection. Loose clothing, gauntlet-type gloves, rings, and watches shall not be worn by workers feeding the chipper.
- Employees shall never place hands, arms, feet, legs, or any other part of the body on the feed table when the chipper is in operation or the rotor is turning. Push-sticks (of material that can be consumed by brush chipper) or long branches shall be used to feed shorter material into the chipper.
- Brush chippers shall be fed from the side of the centerline, and the operator shall immediately turn away from the feed table when the brush is taken into the rotor. Chippers shall be fed from the curbside whenever possible.
- Material such as stones, nails, sweepings, etc. shall not be fed into brush chippers.
- The brush chipper discharge chute or cutter housing cover shall not be raised or removed while any part of the chipper is turning or moving.

### **9.57 Aircraft/Airfield Construction Safety and Phasing Plan**

Not applicable.

### **9.58 Aircraft/Airfield Safety Plan Compliance Document**

Not applicable.

### **9.59 Site Safety and Health Plan for HTRW**

Any elements required by EM 385-1-1 for hazardous/toxic waste work per Section 33 of EM 385-1-1 are included within this APP.

### **9.60 Confined Space Entry Procedures**

Not applicable.

### **9.61 Confined Space Program**

Confined space: a space that is large enough and so configured that a person can bodily enter and perform assigned work; and

- Has limited or restricted means for entry or exit [such that the entrant's ability to escape in an emergency would be hindered (e.g., tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry; doorways are not considered a limited means of entry or egress)]; and
- Is not designed for continuous worker occupancy.

The trommel barrel and open excavations that are over 4 feet in depth are considered a confined space. In addition, the trommel has sources of potential energy which can present additional hazards that must be addressed through control of hazardous energy procedures.

The SS/SSHO and subcontractor supervisors will not allow entry into any confined space unless specifically authorized in this plan (not authorized at the present time) by qualified personnel following all required safety precautions for confined space entry according to EHS Procedure 6-1 and OSHA's Permit-Required Confined Space Regulations (29 CFR 1910.146, and Section 34 of EM 385-1-1. The SS/SSHO will evaluate the site for any potential confined spaces and ensure they are appropriately marked with warning signs and that personnel are informed/trained to recognize these locations and know that entry into these spaces is prohibited unless the requirements of the TtEC Confined Space Program and the confined space entry procedures in Section 9.60 above are fully developed and implemented for confined space entry and are approved by the SHM.

Site workers are provided confined space awareness training as part of the project orientation training. As part of this awareness training, workers are instructed on how to identify confined spaces, what entry requirements there are (which are not currently authorized), and who to contact if they believe a confined space exists. The awareness class is not the required training class if entry into a confined space is required. Workers who enter, attend, or supervise entry into a confined space, including rescue must have additional training in compliance with 29 CFR 1910.146 and be designated as qualified to perform their assigned tasks related to confined space entry by their employer.

## 9.62 Other Hazards and Classic Safety Requirements and Precautions

Physical hazards not otherwise specifically addressed in the above sections are covered in the following sections.

### 9.62.1 Site Rules/Prohibitions

Where not otherwise addressed specifically in this APP and/or referenced SOPs in the project Work Plan (when applicable), TtEC employees are directed to follow the applicable requirements identified in the Project Orientation Rules Safety Guidelines Handbook©, Volumes I (Project Orientation and Rules) and II (Environmental, Health, and Safety Guidelines. (TtEC 2014). A copy of this Handbook can be found in the TtEC Corporate Reference Library under “Manuals” and/or a copy will be available on-site.

Furthermore, the following describes the basic site rules and prohibitions that TtEC expects TtEC and subcontractor employees to follow during this project in addition to those specified elsewhere. All workers have a responsibility to ensure that all project activities proceed efficiently and safely.

1. Attend each day's work briefing and other safety training as scheduled.
2. Comply with all Work Plans and procedures, and identify any changes in the plan immediately to your supervisor.
3. Inform your medical care physician if you are taking prescribed medication. The medical consultant will determine whether you can safely work on site while taking the medication.
4. Wear the personal PPE specified in the APP and AHAs.
5. If you are required to wear a respirator, remove facial hair (beards, long sideburns, or mustaches) that may interfere with the satisfactory fit of the respirator mask.
6. Become familiar with the on-site hazards, work zones, PPE requirements, and decontamination methods.
7. Immediately report any incident, accident, injury, safety hazard, or symptoms of possible exposure, no matter how minor, to your supervisor or safety representative. If you are unable to obtain resolution at the project level, notify the SHM at the phone number indicated on a project emergency contact list (Table 9-2) that is found on every project site or call the Compliance Hotline at 1-800-886-2577.
8. Stop work if an imminent danger situation exists.
9. Follow proper decontamination procedures.
10. Enter and exit the EZ and the Contamination Reduction Zone (CRZ) through designated areas.
11. Sign the in/out log and the CRZ/EZ log when used on the project.
12. Do not eat, drink, chew tobacco or gum, smoke, or engage in any other such activity that may increase the possibility of personal contamination, in the EZ or the CRZ.
13. Do not use lighters or matches in the EZ and CRZ.
14. Obey all authorized safety signs and demarcations. Do not place or remove these items except as authorized by the project safety lead.

15. Do not enter a confined space without the permit and proper training, and follow all requirements of permit as issued. Full compliance with the TtEC EHS procedure is required.
16. Follow lockout/tagout procedures when working on equipment that has moving parts or hazardous energy sources. Install and remove locks and tags only in accordance with procedure and only when authorized.
17. Check with your supervisor prior to starting any Hot Work operation (welding or cutting operations) and, if you are working in an area that requires a Hot Work Permit, follow all requirements of the permit as issued.
18. Use the buddy system when performing operations in hazardous areas, when working with hazardous contaminants, when physical capabilities may become stressed (heat/cold stress), or when working in proximity of operating machinery or equipment.
19. Follow the work/rest regimens and other practices required by the heat and cold stress procedures.
20. Do not operate equipment unless you are properly trained and authorized to do so in a manner consistent with the owner/operator's manual.
21. Do not operate motor vehicles without a valid driver's license.
22. Comply with Base site security requirements and carry any issued identification card or badge required for the project. Do not enter restricted areas unless authorized to do so.
23. Use vehicle or equipment seat belts any time the vehicle or equipment is in operation.
24. Use ladders that are solidly constructed and in good working condition and that have been properly secured and inspected prior to use. Remove defective ladders or scaffolds from service, tag as "Defective—Do Not Use," and have them repaired or disposed of by competent personnel.
25. Inspect equipment and hand or portable manual and power tools prior to use. Remove defective tools and equipment from service and either dispose of them or have them properly repaired.
26. Always use ground fault circuit interrupters for cord-and-plug equipment used outdoors or in damp locations. Keep electrical cords out of walkways and out of accumulations of water unless protected and rated for such service. Inspect cords daily. Ground electrical generators while they are in use.
27. Do not improperly use, mishandle, or tamper with health and safety equipment and samples.
28. Do not engage in horseplay of any kind. Do not run or jump from equipment, except as necessary in an emergency.
29. Do not bring, keep, or use alcoholic beverages, controlled substances, or unauthorized weapons on site. The following are prohibited:
  - Illegal drugs (under Federal regulations), illegal look-alike, designer drugs, and drug paraphernalia;
  - Controlled substances, such as medications, when usage is abused;
  - Valid medications, when not kept in marked prescription bottles;
  - Alcoholic beverages;
  - Unauthorized firearms, weapons, and ammunition;
  - Unauthorized explosives;
  - Stolen property or contraband;

- Unauthorized cameras or photographic equipment; and
  - Unauthorized recording devices.
30. Do not bring pets on project premises.
  31. Become familiar with the Emergency Response Plan or Emergency Action Plan (as applicable) so that you can respond properly in an emergency.
  32. Become familiar with the locations and types of emergency equipment, such as fire extinguishers, emergency showers, spill response equipment, eyewash, and air horns.
  33. Practice contamination avoidance techniques.
  34. Obtain help to lift or move bulky or heavy objects and any object weighing more than 50 pounds.
  35. Keep work, storage, and access areas orderly and free of debris.
  36. Implement, adhere to, and follow established rules, guidelines, procedures, plans, etc., as specified.
  37. Stop work and ask questions of your supervisor when you are uncertain about a procedure or equipment use.
  38. Perform all tasks in a safe and approved manner.
  39. Participate in the evaluation or investigation of any accident or incident when you are requested to do so.
  40. Do not bring visitors or children on project premises without the express written permission of the project manager, construction supervisor, or their designee.

There will be instances when additional or different health and safety rules or requirements must be followed, or when a situation may arise for which a project rule or requirement may become inappropriate. Should this occur, the project safety lead, after careful evaluation, may authorize a variance to the rule or requirement. Variances will also require the approval of the project manager. When a variance is granted, it will be allowed to continue only so long as the conditions for which it was evaluated continue to occur.

#### 9.62.2 Motor Vehicle and Heavy Equipment Operations

The project will use excavators, front-end loaders, and dozers to perform materials and soil handling tasks. In addition, rolloff trucks, dump trucks, or other trucks may be used to haul waste and material on and off site. This equipment poses unique and immediate hazards that, if uncontrolled, can result in severe injury or fatality. Injuries can result from malfunctioning equipment, improper operation, or personnel placing themselves in operator “blind spots” or between pieces of the equipment, or between equipment and immovable objects.

Personnel will receive initial and regular reminders that it is their responsibility to remain out of the operating areas of any moving heavy equipment to avoid being injured. In addition, the following precautions will be taken to help prevent injuries and accidents:

- Brakes, hydraulic lines, light signals, fire extinguishers, fluid levels, steering, tires, horns, and other safety devices will be checked at the beginning of each work day.
- Examination of hydraulic lines will emphasize those lines in close proximity to the operator.

- A piece of paper or cardboard will be employed to check for high pressure leaks in this area that could result in hydraulic fluids being injected into the skin. Using gloved or bare hands for this inspection is prohibited.
- Large equipment will not be backed up unless equipped with a reverse signal alarm, audible above the surrounding noise level, and backup warning lights, or unless the vehicle is backed up only when an observer (spotter) signals that it is safe to do so.
- Motor vehicle cabs will be kept free of all non-essential items and all loose items including equipment and/or samples will be secured.
- The parking brake, for vehicles so equipped, will be set before shutting off and dismounting a vehicle.
- Wearing of seat belts is mandatory at all times when vehicle is in operation.
- During periods of rain, fog, or other adverse weather conditions, the use of headlights is mandatory.
- All posted traffic signs and directions from flagmen (if used) or spotters will be observed.
- Personnel will be prohibited from placing themselves between operating equipment and immovable objects.
- Personnel will wear class 2 high-visibility vests to increase visual recognition whenever working within 15 feet of an established traffic pattern/route or working near heavy equipment.
- Efforts will be directed to minimize the number of personnel within an area where equipment is being operated.

Heavy equipment operators have a limited field of vision and may not be aware that someone is near the equipment being operated. Therefore, although heavy equipment is required to be equipped with warning devices such as backup alarms, and the operator is required to operate with caution, it is incumbent on personnel in the area to maintain sufficient distances from the equipment. For example, a sufficient distance is beyond the reach of an excavator turning a full 360 degrees with its bucket and boom fully extended. It is also incumbent on personnel in the area to ensure that they have made eye contact with the operator prior to moving within the reach of the excavator or other mechanical equipment. The operator must cease operations and rest the bucket (or other extension) on the ground before personnel approach. Caution will be exercised at all times. It will be emphasized that personnel should NEVER place themselves between operating heavy equipment and immovable objects due to the potential for crushing injuries and death. Furthermore, it is required that the operator obtain a spotter for all backing operations.

Heavy equipment (excavators, loaders, dozers, etc.) will be controlled via the following measures:

- Ensuring that only appropriately qualified/experienced personnel are permitted to operate the devices.
- Initial and periodic inspections of heavy equipment to provide safe operation will be documented by using the Equipment Inspection Checklist found in Appendix C.
- Keeping heavy equipment operations areas clear and otherwise adequate to allow for the safe movement of the equipment without endangering personnel or property.
- Implementing appropriate vehicle maintenance and decontamination operations.

Safe and proper practices will be followed at all times, or vehicle operating privileges will be suspended or revoked at the discretion of the SS/SSHO. The SS/SSHO will be responsible for ensuring that these requirements are implemented on site.

TtEC personnel will follow locally established traffic rules and the Traffic Plan in the Work Plan. Other operations may be ongoing simultaneously with TtEC activities. Coordination with other CAX activities, tenant, or contractor operations will be done as required through coordination with the FEAD and NTR/RPM to ensure traffic safety, personnel safety, and the delineation of controlled work zones. Site vehicles will yield to pedestrians, when present. Personnel working in areas subject to vehicular traffic or operating construction equipment will wear class 2 high-visibility safety vests. Fences may be used to delineate controlled work zones when necessary to keep unauthorized personnel out of the work area and to secure the area during non-work hours. Personnel will not direct traffic unless they have received training in compliance with OSHA regulations and EM 385-1-1 Section 04.B.12.

### 9.62.3 Mechanical Screening Plant Hazards

Inspection, maintenance, and repair activities must be performed on the screening plant in accordance with the manufacturer's recommendations by a Qualified Person (QP) and the entire system will be visually inspected daily before start up. Depending on the configuration of the screening plant, hazards can include vibration, noise, chutes and barrels that rotate or conveyor systems that present pinch points.

The following requirements apply for controlling the various hazards associated with a screening plant operation with regard to conveyor systems, machine guarding, lockout-tagout, and emergency shut down.

- All the parts of the screening plant must be constructed and installed in accordance with the manufacturer's recommendations as part of the overall system.
- No maintenance shall be performed when a conveyor, trommel barrel, or shaker table is in operation except for the following:
  - If lubrication is to be done while the conveyor, trommel barrel, or shaker table is in motion, lubrication points shall be accessible through guard openings which are small enough that fingers cannot reach the hazardous locations. Only trained personnel who are aware of the hazards of the system in motion shall be allowed to lubricate any moving part that is operating; and
  - When adjustments or maintenance is required while the equipment is in operation, only trained personnel who are aware of the hazards shall be permitted to make the adjustment or maintenance and only in accordance with the manufacturer's guidance. If guards need to be removed for the adjustment or maintenance, the conveyor, trommel barrel or shaker table MUST be locked out prior to removing the guards.
- Hazardous Energy Control Procedures shall be used for maintenance and servicing other than lubrication which is done without removing guards and these procedures must be

included in the AHA for the maintenance task.

- Safe access shall be provided to permit inspection, lubrication, repair and maintenance activities.
- On all conveyors where reversing or runaway are potential hazards or the effects of gravity create a potential for hazardous uncontrolled lowering, anti-runaway devices, brakes, backstops, or other safeguards shall be installed to protect persons from injury and property from damage.
- Conveyor systems shall be equipped with a time-delay audible and visual warning signal to be sounded immediately before starting of the conveyor.
- Safety devices shall be arranged to operate in such a manner that if power failure or a failure of the device occurs a hazardous condition would not result. The safety devices shall be designed to prevent the conveyor or other component from restarting until the safety device is manually reset.
- All exposed moving machinery parts that present a hazard shall be mechanically or electrically guarded or guarded by location.
  - Nip and shear points shall be guarded.
  - Take-up mechanisms may be guarded as an entity by placing standard railings or fencing, and warning signs, around the area in lieu of guarding each nip and shear point.
  - In the case of a trolley conveyor when mechanical or electrical guarding would render the conveyor unusable, prominent and legible warnings shall be posted in the area or on the equipment and, where feasible, areas barricaded or lines marked on the ground to indicate the hazard area.
  - Guards shall be provided at points where personnel could contact cables, chains, belts.
  - Unless guarded by location, those sections of chain conveyors that cannot be enclosed without impairing the function shall be provided with warning signs or personnel barriers.
  - Trolley conveyors shall be provided with spill guards, pan guards, or the equivalent if there is a potential for material to fall off the conveyor and endanger personnel or equipment.
  - At transfer, loading, and discharge points, unconfined and uncontrolled free fall of material that may result from flooding, ricocheting, overloading, trajectory, leakage, or a combination thereof, shall be prevented if the material would create a hazard to personnel. In the absence of a guard specifically erected to protect personnel, warnings shall be provided to restrict unauthorized personnel from entering such hazardous areas.
  - At all points along the conveyor, except at points where loads are removed from or placed on a conveyor or where a conveyor discharges to or receives material from another conveyor, provisions shall be made to eliminate the possibility of loads or material being dislodged from the conveyor.
  - The build-up of excess material shall be removed from all points along the conveyor.
- Crossovers or underpasses with safeguards shall be provided for passage over or under all conveyors: crossing over or under conveyors is prohibited except where safe passageways are provided.
- Whenever conveyors pass adjacent to, or over, work areas, roadways or other public passageways, protective guards shall be installed. The guards shall be designed to catch

and hold any load or material that may fall off or become dislodged from the system.

- Emergency stop buttons on screening plant shall be red in color, easily identifiable and readily accessible. They shall not be protected with collars or other devices which might make it difficult to activate.
- Starting controls shall be GREEN in color and protected from accidental activation.
- All controls shall be clearly labeled to identify their function.
- Unless the design, construction, and operation of a conveyor or trommel is clearly nonhazardous to personnel, emergency stop buttons, pull cords, limit switches, or similar emergency devices shall be provided at the following locations:
  - (1) Operator stations;
  - (2) Loading arms;
  - (3) Transfer points; and
  - (4) Other potentially hazardous locations on the conveyor path or trommel barrel not guarded

#### 9.62.4 Electrical Hazards

In order to prevent accidents caused by electric shock, the SS/SSHO will inspect any electrical connections on a daily basis. The SS/SSHO will shut down and lock out any equipment that is found to have frayed or loose connections until a qualified electrician is contacted and repairs are made. The equipment will be de-energized and tested before any electrical work is done. The equipment will be properly grounded prior to, and during, work. In addition, ground fault circuit interrupters (GFCIs) will be installed for each circuit between the power source and tool for outdoor use. In the event that generators are used to supply power, these generators will contain GFCIs.

Requirements for electrical safety include:

- Electrical wiring and equipment will be listed by a Nationally Recognized Testing Laboratory (NRTL). The usual recognized testing laboratories are Underwriters Laboratory (UL), Canadian Standards Association (CSA-US), and Factory Mutual (FM).
- Live parts of wiring and equipment will be guarded to protect persons or objects from harm. Un-insulated live wires must be placed at various heights and distances from the ground and from buildings, depending on the voltage carried by those lines. (Consult the SHM if un-insulated live wires are anticipated.)
- A qualified electrician will perform the work on electrical power supplies and lines. No live electrical work will be performed unless a permit is obtained from the FEAD as specified in EM 385-1-1 Section 11.A.02(c) and the SHM has approved the procedure. Compliance with Section 11 is required. Live electrical work requires arc flash protection.
- Flexible cords (extension cords) will contain the number of conductors required for service, plus a ground wire. Cords will be rated for hard usage (S, SE, SEO, SO, SOO, ST, STO, STOO). Flexible cords are not allowed to pass through doors or windows, or to be placed on the ground where they are subject to being run over by vehicles. If flexible cords must pass through walls, the cords will be protected by bushings or fittings.

- Flexible cords must be inspected on each day of use. No splices or fraying are allowed.
- Flexible cords will not be secured with staples, hung from nails, or suspended by bare wire. (Plastic tie straps, commonly used today, are acceptable.). Extension cords will not be plugged into other extension cords. Extension cords will not be plugged into power strips.
- Portable lamps must have bulbs protected by a substantial guard and attached to the lamp holder handle.
- The circuit breaker panels and electrical transformers and supply equipment must be labeled as to the voltage contained therein.
- The circuit breaker panels must be labeled as to what each breaker controls.
- The breaker panels and electrical panels must have a cover protecting any live exposed wires.
- At least a 36-inch clearance must be maintained on three sides of the circuit breaker boxes, transformers, and electrical supply equipment so as to provide ready access to the equipment in the event of an emergency.
- Circuit breaker boxes that are locked, or kept in locked rooms, must have a key readily available in the event of an emergency.

#### 9.62.5 Portable Generators

Portable generators must meet the requirements for grounding as specified in the National Electrical Code (NEC) National Fire Protection Association 70. NEC 250-6 has certain exemptions for the grounding of portable and vehicle-mounted generators. Refer to EM 385-1-1, Section 11, for additional details. Portable generators will be operated in open air only, where there is sufficient ventilation to prevent accumulation of exhaust gases, including carbon monoxide.

#### 9.62.6 Overhead Electrical Hazards

Overhead power lines (if present) may present a hazard to equipment and personnel if inadvertent contact is made. To prevent equipment contact with power lines and to prevent arcing, adequate clearance must be maintained. TtEC requires a minimum clearance of 15 feet. If adequate clearance cannot be maintained, electrical disconnects may be required to secure against a contact hazard. The voltage of overhead lines must be ascertained in order to determine if more than 15 feet clearance is required. The SS/SSHO will evaluate the work site to determine if there are any overhead power lines present in any location where activities are being conducted, including in travel routes and if present, will take actions to ensure clearance is maintained.

#### 9.62.7 Underground Utilities

A high-loss-potential hazard includes ground disturbing activities with its associated potential for contact with underground utilities. When conducting intrusive activities such as grading, and dredging, the opportunity to encounter fire, explosion, or electrocution hazards exists from inadvertent contact with underground utilities. Therefore, the locations of underground utilities will be verified prior to performing any intrusive activities and precautions will include: white-

lining the area; having utilities located using a private locating service, National One Call (811); and performing a geophysical survey to clear utilities in the area of the intrusive operations.

#### 9.62.8 Slips, Trips, and Falls

Planned activities associated with construction operations will bring field personnel into areas with potential slip, trip, and fall hazards. These hazards may include the following:

- Uneven terrain due to cultural debris or depressions.
- Sumps and trenches in building footprint foundation areas
- Slopes and excavations, including along the shoreline
- Workplace clutter
- Wet or slippery surfaces.

Hazards of this nature and the potential consequences of injury from a slip, trip, or fall are more likely when personnel are maneuvering and carrying equipment on these work sites or are busy with tasks and not paying attention to surroundings.

Control measures may include the following:

- Selecting the best approach routes to work areas and locations, keeping in mind that these may not be the shortest routes
- Applying traction grit such as sand over slippery surfaces
- Fixing and maintaining degraded stairs, rails, and surfaces and proper cleaning to remove moss or other growth.
- Maintaining good housekeeping practices
- Using barricades or other appropriate warnings to demarcate hazard areas
- Proper selection and use of portable ladders (as required)
- Proper selection and use of fall protection equipment (as required)

The SS/SSHO will evaluate all walking/working surfaces to ensure these comply with the objectives stipulated in 29 CFR 1926 Subparts C – General Safety and Health; G – Signs, Signals and Barricades; Subpart L – Scaffolds; Subpart M – Fall Protection; Subpart P – Excavations, and Subpart X – Stairways and Ladders. Requisite strength, heights and widths, and fall protection will be evaluated as required for the work tasks. Also refer to EM 385-1-1.

#### 9.62.9 Head Injuries

At a minimum, workers will don hard hats if they have an overhead hazard or when working around heavy equipment. This will prevent minor injuries caused by bumping one's head while working around the site.

### 9.62.10 Falling Objects

Raised items will be slowly lowered to the ground appropriate rigging and equipment. No personnel will work under equipment or suspended loads at any time. Also, the supervisor will verify that a sufficiently wide area is clear of personnel while the equipment is in operation.

### 9.62.11 Heavy or Awkward Lifting

Hazards associated with heavy or awkward lifting are more frequent in the early morning hours (prior to muscles becoming limber) and later in the day (as a result of fatigue). The following provisions will be used to minimize hazards of this nature:

- Use machinery, lifting-assist devices (two wheeled carts or dollies), or multiple personnel for heavy lifts, where possible. (TtEC prohibits lifting more than 50 pounds without assistance.)
- Use proper lifting techniques.
- Plan your lifts: place heavy items on shelves between the waist and chest and lighter items on higher shelves. Also, if the load must be carried to another location, plan and inspect the route to ensure that slipping/tripping hazards are absent.
- Stretch and limber muscles prior to and after extended periods/frequent lifts.
- “Test” the lift; before attempting to fully lift or move an object, give the object a “nudge” to assess its approximate weight and your ability to safely lift and move it without injury. If you are not confident that you can complete the lift without hurting yourself, either get a lifting aid (such as a dolly or mechanical hoist), get help from others, or both.
- Move as close to the load as possible, and ensure that good hand holds are obtainable. Wear gloves where necessary to improve hand holds.
- Lift with your legs, not your back; bend your knees slightly and avoid turning and twisting at the waist when lifting, carrying, or depositing loads.
- Break lifts into steps if the vertical distance from the starting point to the placement of the lift is excessive.
- Periods of high-frequency lifts or extended-duration lifts should include sufficient breaks to guard against fatigue and injury.

Other considerations associated with lifting injuries and muscle strains include the following:

- Assess the area available to maneuver the lift.

Rearrange the area, remove clutter, and minimize the necessity of twisting and turning.

- Evaluate the area of the lift.
  - Investigate conditions of the walking/working surfaces where the lift will occur, over the planned path of travel, and at the location the load will be deposited.
  - Conditions such as poor housekeeping/clutter, slippery surfaces, and rough or uneven terrain may magnify the potential for injury during a lift.

- Take into account your overall physical condition
  - Report previous injuries on your Medical Data Sheet or inform supervisor of limitations.
  - DO NOT attempt to lift items that will put you at risk.
  - Break loads that you must carry into smaller, manageable loads, and get assistance whenever significant lifting tasks are involved.

By evaluating applicable contributing factors, planning your lifts, and incorporating feasible control measures, the potential for injury associated with lifting can be minimized.

#### 9.62.12 Portable Power Hand Tools

Any portable power tools (e.g., saws, drills, pressure washers, pumps, etc.) used in the work area must have appropriate guarding, interlocks, or controls to ensure safe operation. Machinery and equipment must be inspected for defects in the guarding, electrical safety, and operation before each use.

The following specific precautions regarding power hand tools will be used to help prevent injuries and accidents:

- Never remove, make inoperative, or reduce the effectiveness of any equipment or machine guard.
- Never override any safety interlock or attempt to operate any piece of equipment or machinery without guards or other required safety devices in place and fully functional.
- Never operate any piece of equipment or machinery when it is functioning improperly or at any time when operation would constitute a hazard. Malfunctioning equipment must be repaired immediately or removed from the premises.
- Do not use electrically-powered tools near flammable materials or within an explosive atmosphere, unless they are of the explosion-proof type meeting the National Electric Code (NEC) requirements for explosive areas. Employees operating the equipment should be aware of sparks and/or metal fragments when using this equipment.
- At no time will electrical power equipment be operated without proper grounding. All electrical cords and cables, including extension cords, must include a third wire ground.
- All electrical power tools will be listed by a NRTL and marked to indicate that they have double insulation if they are not internally grounded.
- Do not use electrical tools in wet or damp areas.
- Use tools only for their intended purpose (e.g., do not use a wrench to hammer an object). Defective tools (e.g., with mushroomed heads or split or defective handles) are to be taken out of service until they can be repaired, or they are to be replaced.
- Do not use conductive (i.e., metal) tools around energized electrical sources. Test insulated
- Select the correct size and type of wrench for each job. Wrench handles will not be extended with a pipe or “cheater” bar.
- Repair mushroomed punch, drift, and chisel heads or take the tool out of service and

replace. Metal particles may break off and fly into the face or eyes of nearby workers when mushroomed heads are struck.

- Wear eye protection at all times when using hand tools (powered or manual).
- All hand tools and power tools will be inspected prior to use. TtEC employs inspection checklists and colored stickers and/or tape, as previously described, to indicate that equipment has been inspected and is ready for use.

## **10.0 RISK MANAGEMENT PROCESSES**

Risk management is a process that includes the identification, assessment, and prioritization of risks, followed by coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events to an acceptable level. TtEC utilizes the AHA as the risk management tool for this process. AHAs for the each DFOW, task, or activity known at this point in time are listed in Section 2.5. Additional AHAs may or may not be required during the course of the fieldwork.

The AHA defines the work sequence, anticipated hazards, conditions, equipment, materials, personnel and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level of risk. Before beginning each work activity/DFOW, TtEC will prepare the initial AHA, which includes a Risk Assessment Code (RAC) for that activity. No work will begin on the activity until the initial AHA has been accepted by the NTR/RPM addressing the activity-specific hazards.

AHAs are living documents and are intended to be created in the field and updated (by the workers with SS/SSHO assistance) as needed. The AHAs will be reviewed and modified as necessary to address changing site conditions, operations, or change of CPs or QPs. If the initial RAC increases due to a change made to the AHA by the workers, the AHA shall be resubmitted to GDA for acceptance prior to work proceeding. Changes to or updates of an AHA that do not increase the RAC are not required to be resubmitted for acceptance by the NTR/RPM and KO.

## **11.0 REFERENCES**

- Baker. 2001. Final Field Investigation Report, Site 7 and AOC 2, Naval Weapons Station Yorktown Cheatham Annex, Williamsburg, Virginia. March.
- CH2MHill. 2015. Engineering Evaluation and Cost Analysis for Area of Concern 2 – Dextrose Dump. January (*draft, in progress*).
- TtEC. 2014. Project Orientation, Rules and Safety Guidelines Handbook. January.
- USACE. 2014. Safety and Health Requirements. Engineer Manual (EM) 385-1-1, November 30, 2014.
- U.S. Department of Labor, Occupational Health and Safety Administration; 1910 – Occupational Safety and Health Standards, General Industry. Code 29 of Federal Regulations (CFR). Parts 1910.95, 1910.120, 1910.132, 1910.134, and 1910.147.

U.S. Department of Labor, Occupational Health and Safety Administration; 1926 – Occupational Safety and Health Standards, Construction Industry. Code 29 of Federal Regulations (CFR). Parts 1926.59, 1926.601, and 1926.602.

## **TABLES**

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**Table 3-1. Comparison of TtEC and 2013 BLS Data for NAICS Code 562910 (TRIR and DART Rates)**

	<b>NAICS 562910 Remediation Services 2013</b>	<b>TtEC 2012</b>	<b>TtEC 2013</b>	<b>TtEC 2014</b>
<b>Total Recordable Incident Rate (TRIR)</b>	2.7	0.30	0.59	0.91
<b>Days Away/Restricted Duty/Transfer Rate (DART)</b>	1.6	0.15	0.59	0.30

Additional information:

0.7 DA Bureau of Labor Statistics (BLS) 2013

0.9 RT BLS 2013

**Table 9-1. Type and Location of Emergency Equipment**

<b>Equipment</b>	<b>Location</b>
Industrial First Aid Kit with Bloodborne Pathogens Kit	SZ for each active work location
Fire Extinguisher, one 10-A-60:BC	SZ for active work locations
Fire Extinguisher, one 1A-10:BC	Site vehicles and heavy equipment
Fire Extinguisher, one 60:BC	Refueling areas
Portable eye wash (15-minute/0/4 gallon per minute)	SZ for active work locations
Air Horn (if not equipped with vehicle horn)	SZ for active work locations
Spill Kit (appropriately stocked with sorbent pads, gloves, and bags, etc.)	SZ for active work locations and refueling areas
Cellular Telephones (with signal booster if required).	Minimum of SS, SSHO, each field supervisor (others as required for safety and communication purposes)

**Table 9-2. Emergency Contact List**

Ambulance (Base Fire and Rescue)	(757) 887-4911
Police (Base Police)	(757) 887-4911
Fire (Base Fire and Rescue)	(757) 887-4911
Emergency Riverside Doctors' Hospital Williamsburg Hospital 1500 Commonwealth Avenue Williamsburg, VA 23185 (See Figure 9-2)	(757) 585-2200
WorkCare®	1-800-455-6155
Case Intervention	1-888-449-7787
Poison Control	1-800-222-1222
Navy Contracting Officer, Zane Perry	(757) 322-4777
Navy NTR/RPM, Angela R P Jones	(757) 341-0485
Navy FEAD and Safety, George Colley	(757) 636-7215
Cheatham Annex Environmental Office (spills)	(xxx) xxx-xxxx
TtEC PM, Mark Pisarcik	(757) 518-8491 x136 (office) (757) 544-2085 (cellular)
TtEC SHM, Roger Margotto, CIH	(619) 471-3503 (office) (619) 988-0520 (cellular)
TtEC SS/SSHO, Gary Phelps	(757) 328-7643 (cellular )
Subcontractor Key Personnel	

*Abbreviations and Acronyms:*

- CIH – Certified Industrial Hygienist
- FEAD – Facility Engineering and Acquisition Division
- NRC – National Response Center
- NTR – Navy Technical Representative
- PM – Project Manager
- RPM – Remedial Project Manager
- SS – Site Superintendent
- SSHO – Site Safety and Health Officer
- SHM – Safety and Health Manager

**Table 9-3. Progressive Clinical Symptoms of Hypothermia**

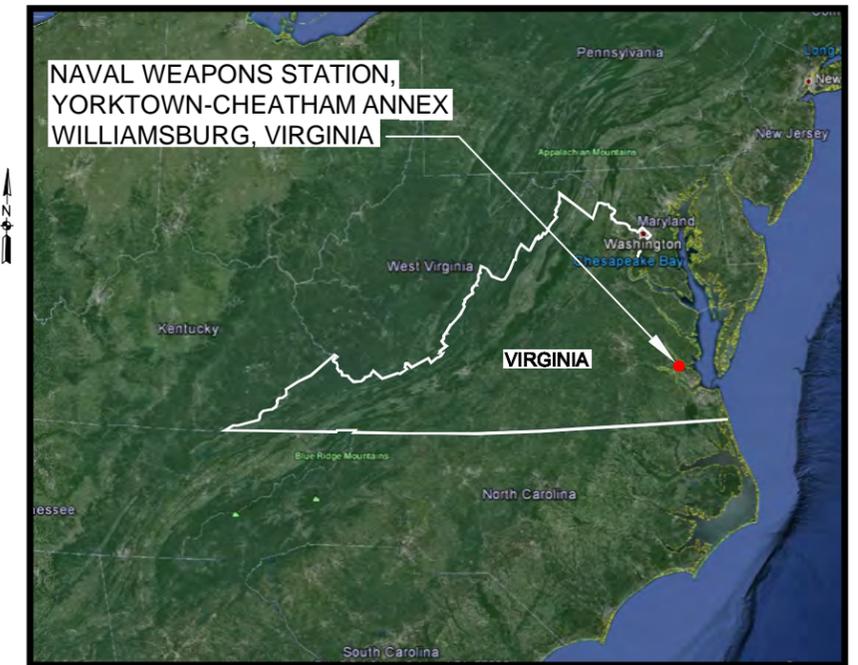
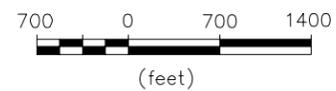
<b>Core Temperature</b>	<b>Clinical Signs</b>
95°	Maximum shivering.
87°-	Consciousness clouded; blood pressure becomes difficult to obtain; pupils dilated.
84°-	Progressive loss of consciousness; muscular rigidity; respiratory rate decreases.
79°	Victim rarely conscious.
70°-	Maximum risk of ventricular fibrillation.

## **FIGURES**

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**SITE LOCATION**



**FACILITY LOCATION**  
NTS

**LEGEND**

— NAVAL WEAPONS STATION BOUNDARY



REMOVAL ACTION AT AOC 2

**FIGURE 2-1**

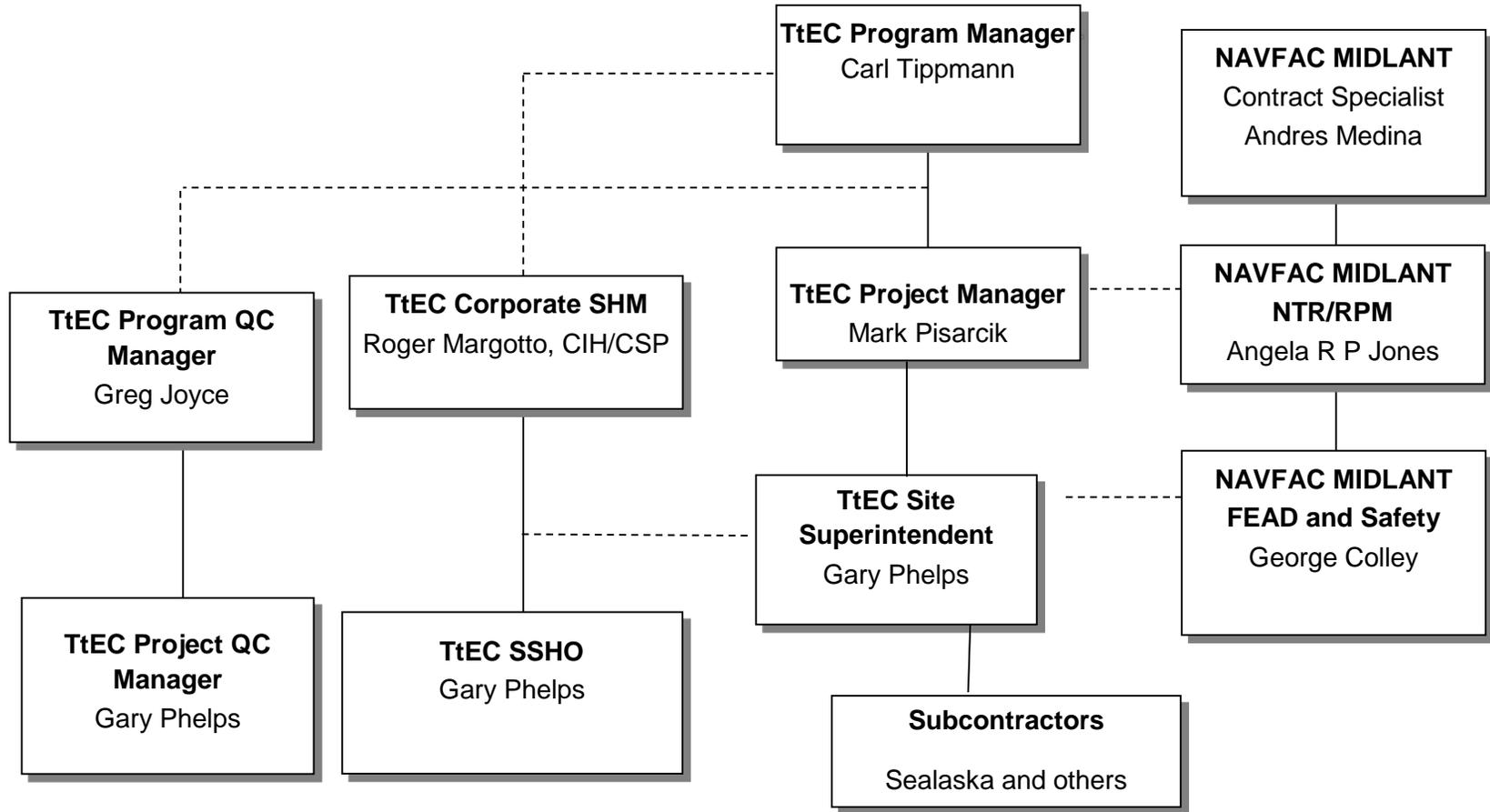
SITE LOCATION AND SITE VICINITY MAP  
NAVAL WEAPONS STATION, YORKTOWN-CHEATHAM ANNEX  
WILLIAMSBURG, VIRGINIA

REVISION: —  
AUTHOR: A.CRABTREE  
PROJECT NO:  
FILE: SEE BELOW

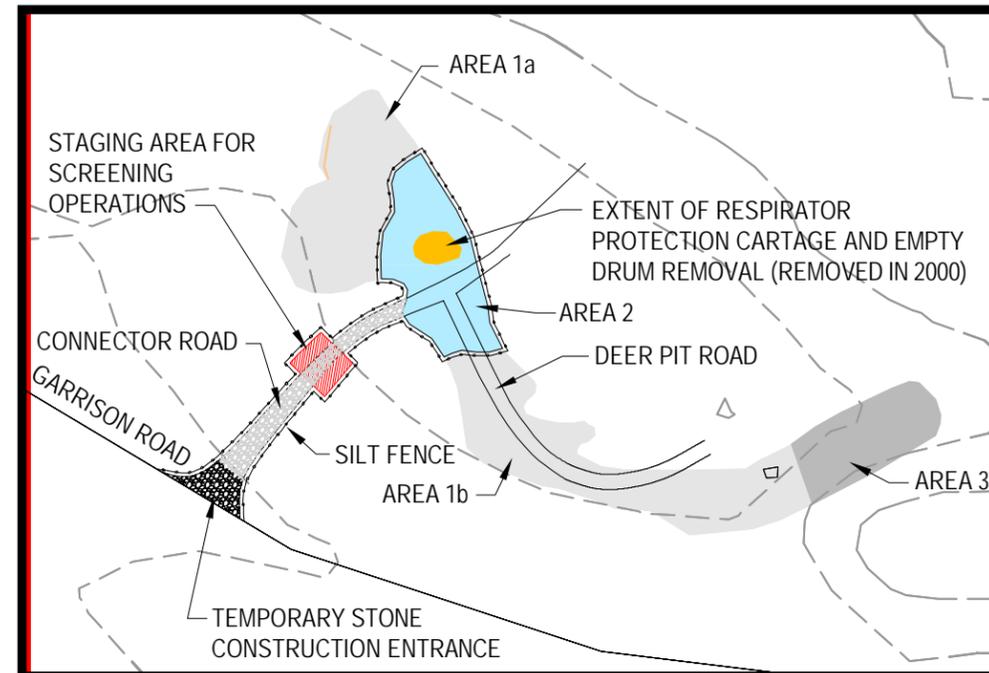
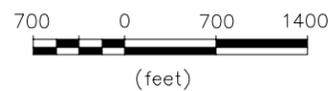
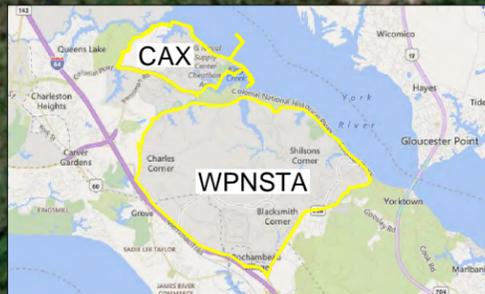
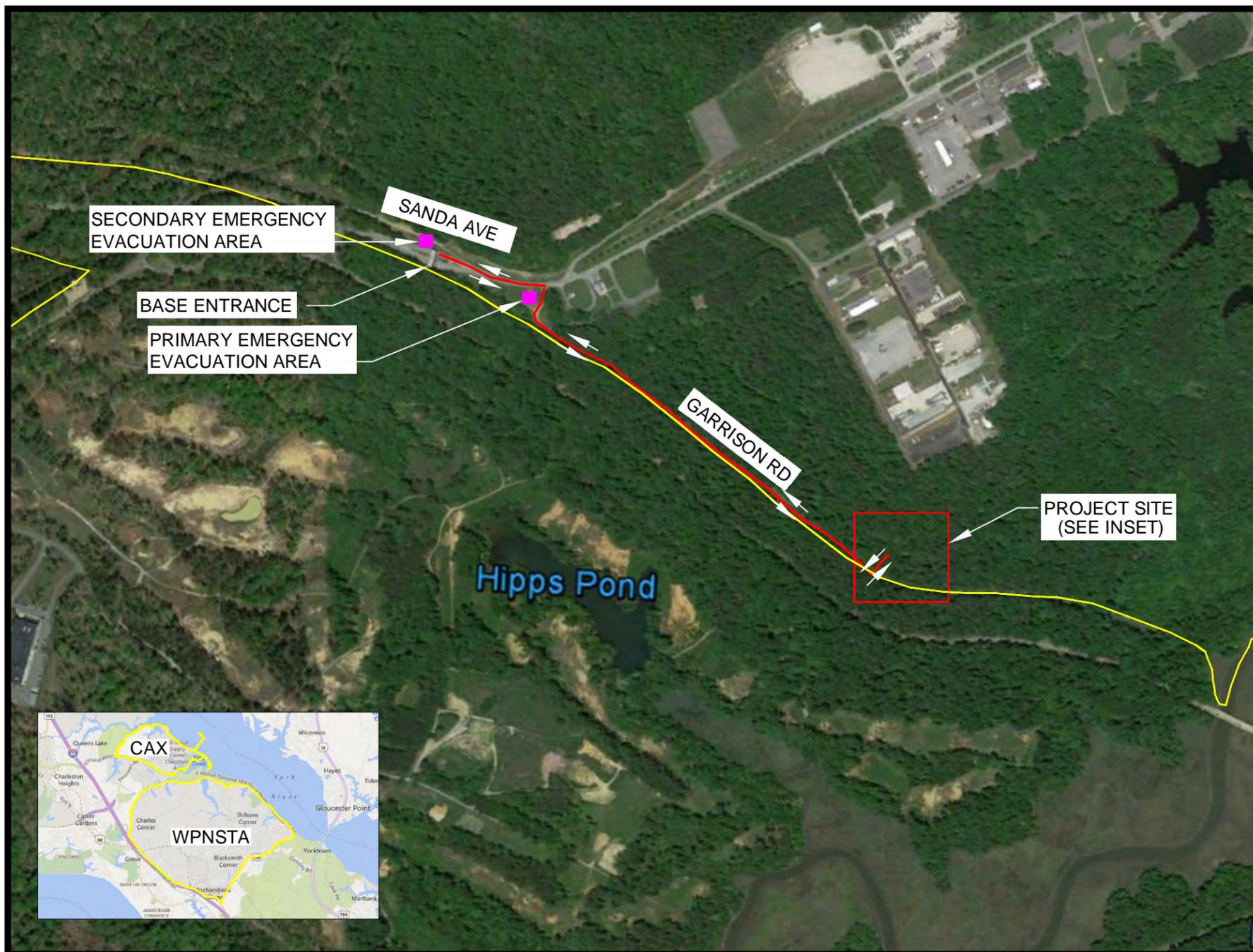


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**Figure 4-1. Organizational Chart**



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INSET

LEGEND:

- NAVAL WEAPONS STATION BOUNDARY
- 5FT CONTOURS
- SILT FENCE
- AREA 1a AND 1b BOUNDARY
- AREA 2 BOUNDARY
- AREA 3 BOUNDARY
- APPROXIMATE EXTENT OF 2000 CARTRIDGE AND DRUM REMOVAL
- STAGING AREA FOR SCREENING OPERATIONS
- TEMPORARY STONE CONSTRUCTION ENTRANCE



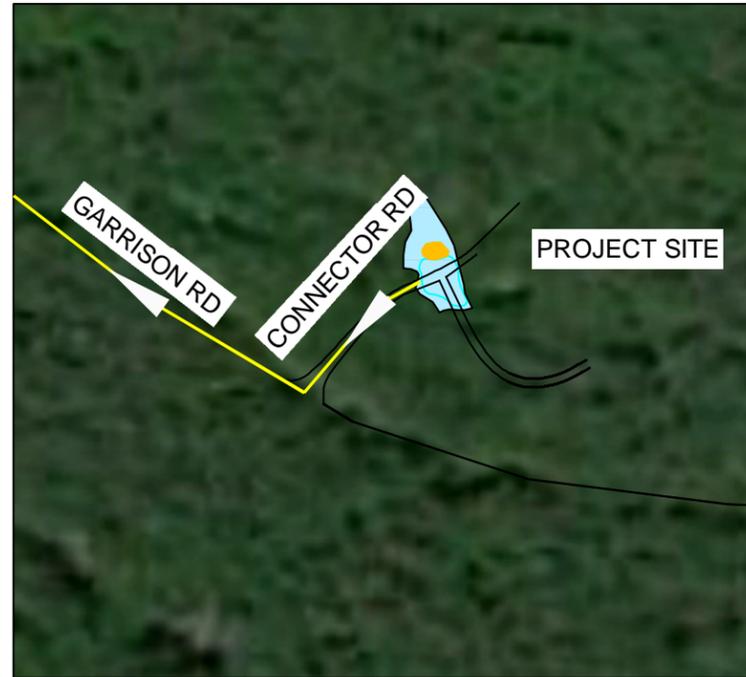
REMOVAL ACTION AT AOC 2

FIGURE 9-1

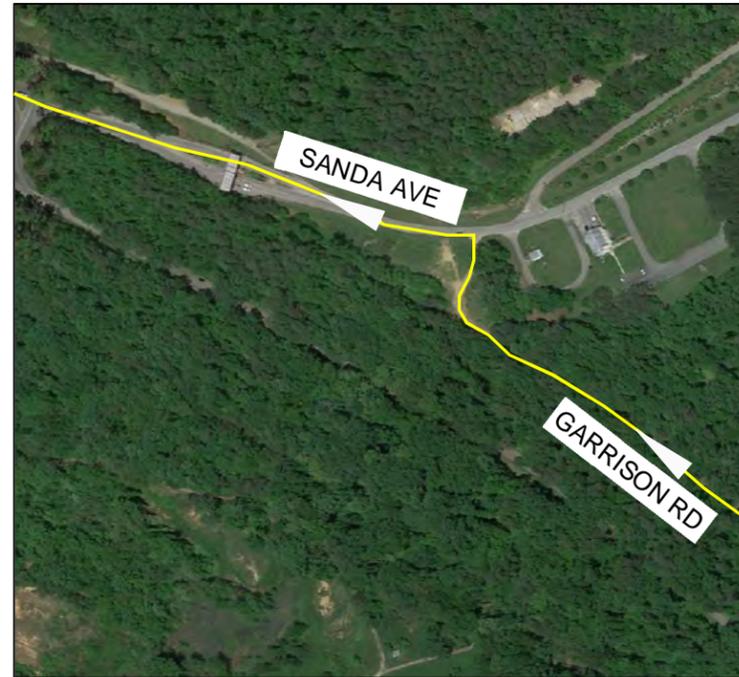
SITE LAYOUT AND EMERGENCY EVACUATION AREAS  
 NAVAL WEAPONS STATION, YORKTOWN-CHEATHAM ANNEX  
 WILLIAMSBURG, VIRGINIA

REVISION: —  
 AUTHOR: A. CRABTREE  
 PROJECT NO:  
 FILE: SEE BELOW





1- FROM CONNECTOR RD TURN RIGHT ONTO GARRISON RD  
HEAD WEST ON GARRISON RD TOWARD SANDA AVE - 1 MIN (0.5 MI)

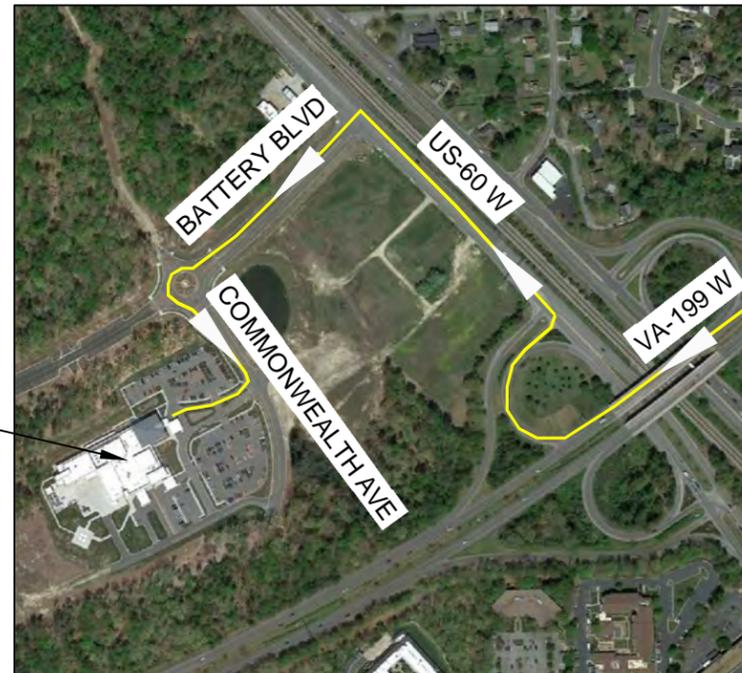


2 - TURN LEFT ONTO SANDA AVE TAKE STATE RTE 641

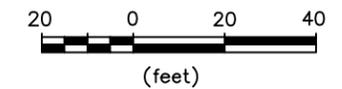


3 - TAKE STATE RTE 641 AND VA-199 W TO BATTERY BLVD IN ROBERTS- 7 MIN (3.8 MI)

DOCTORS' HOSPITAL WILLIAMSBURG  
1500 COMMONWEALTH AVE  
WILLIAMSBURG, VA 23185  
PHONE: (757) 585-2200



4 - TAKE THE US 60 EXIT TOWARD WILLIAMSBURG/BUSCH GARDENS - 0.1 MI  
TURN LEFT ONTO US-60 W - 0.2 MI  
CONTINUE ON BATTERY BLVD TO YOUR DESTINATION IN WILLIAMSBURG - 2 MIN (0.4 MI)  
TURN LEFT ONTO BATTERY BLVD - 0.1 MI  
AT THE TRAFFIC CIRCLE, TAKE THE 3RD EXIT ONTO COMMONWEALTH AVE - 0.2 MI  
DESTINATION WILL BE ON THE RIGHT - 213 FT



REMOVAL ACTION AT AOC 2

FIGURE 9-2

ROUTE AND DIRECTIONS TO DOCTORS' HOSPITAL WILLIAMSBURG  
FROM FIELD OFFICE  
NAVAL WEAPONS STATION, YORKTOWN-CHEATHAM ANNEX  
WILLIAMSBURG, VIRGINIA

REVISION: -  
AUTHOR: A.CRABTREE  
PROJECT NO:  
FILE: SEE BELOW



**APPENDIX A**  
**CORPORATE SAFETY AND HEALTH POLICY STATEMENT**

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## **STATEMENT OF SAFETY AND HEALTH POLICY**

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 expected 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<sup>®</sup>, Do It Right<sup>®</sup>, and Shared Vision<sup>®</sup>, Zero Incident Performance<sup>®</sup> operating philosophies.

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**APPENDIX B**  
**EHS PROGRAMS AND PROCEDURES**

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**Purpose:** The purpose of this procedure is to identify minimum requirements, and to provide guidance to Tetra Tech EC, Inc. (TtEC) project personnel concerning the management of construction tools and equipment on a construction project incorporating the Corporate operating principles of 'Do It Right

®

', 'Client Service Quality

®

', and 'Shared Vision

SM

'.

**Status:** Complete

**Version Date - Type:** 10/16/2009 - Revised

**Category:** Company Procedures

**Sub-Category:** Departmental/Discipline

**Keyword Index:**

**Approved By:** John DeFeis  
**Title:** Construction Tools and Equipment  
**Original Issue**  
**Date:**  
**Sections:** Construction  
**Document** Procedure  
**Type:**  
**Document** Tom DelMastro  
**Owner**

1.0 PURPOSE

2.0 SCOPE

3.0 MINIMUM REQUIREMENTS

3.1 DEFINITIONS

3.2 ROLES & RESPONSIBILITIES

3.3 SAFE OPERATION REQUIREMENTS FOR TOOLS

4.0 GUIDANCE

4.1 ADDITIONAL CONSIDERATIONS

5.0 REFERENCES

6.0 ATTACHMENTS

The purpose of this procedure is to identify minimum requirements, and to provide guidance to Tetra Tech EC, Inc. (TtEC) project personnel concerning the management of construction tools and equipment on a construction project incorporating the Corporate operating principles of 'Do It Right®', 'Client Service Quality®', and 'Shared

This procedure applies to all TtEC projects that include a construction, O&M, and/or UXO component, including remediation construction.

### **3.1 Definitions**

#### **3.1.1 Construction Equipment**

For the purposes of this procedure, construction equipment shall mean heavy equipment, such as excavators, scrapers, off-road trucks, dozers, road graders, compactors, dredges, and cranes; light equipment, such as skid-steers, forklifts, generators, and light plants; and operating systems such as screens, crushers, conveyors, pugmills, mobile treatment plants, and pumps. Any discussion of construction equipment shall be understood not to include cars, pickup trucks, flatbed trucks, etc. registered for use on public roadways, which shall be called vehicles hereinafter. Also for the purposes of this procedure, construction equipment shall be synonymous with Contractor's Equipment, a term also commonly used in the construction industry to designate the types of equipment described above.

#### **3.1.2 Terms**

The terms "should, may, and might" as used in statements in this procedure are intended to denote a discretionary consideration; the terms "shall & must" are intended to impose a mandatory requirement. The terms "is, are, & will" as used in statements in this procedure are intended to denote discretionary or mandatory requirements that are addressed in other department/disciplines' procedures. However, nothing contained herein should be interpreted as to prohibit development and approval of project-specific procedures or plans that take exception to mandatory direction presented in this procedure provided that the appropriate level of approval (Executive Vice President of Construction, Business Line Executive Vice President, or the Vice President ESQ Services as appropriate) is obtained for deviations from such requirements.

#### **3.1.3 Tools of the Trade**

Specific hand tools and or equipment (e.g., manlifts, trucks, trenchers, and pumps) normally provided by or to workers for the performance of their particular work activity.

### **3.2 Roles & Responsibilities**

#### **3.2.1 Equipment Supervisor**

Depending on the project's equipment needs, an individual may be designated as the Equipment Supervisor. Responsibilities of the Equipment Supervisor include:

- Determination of the equipment needs for the project;
- Providing input to the Work Plan concerning equipment;
- Identification of Contract and legal/regulatory requirements for mobilization of equipment on client facilities;
- Submittal of required certifications, inspection reports, and test reports for equipment;
- Arranging for the mobilization/demobilization of equipment in support of the project's schedule, providing required notices, such as mobilization details and dates, and obtaining Contractual or

legally required approvals for mobilization;

- Receipt inspection of equipment arriving at the site, including coordination of any client or third party inspection;
- Coordination with equipment yard personnel or vendors regarding equipment maintenance;
- Ensuring implementation of safe work practices for equipment utilization; and  
Assuring that the return of demobilized equipment is performed in accordance with the terms of the rental/lease/PO agreement and documented correctly, or, for TtEC owned equipment, that the equipment transfer form is completed and coordinated with the Equipment Manager; and
- All other responsibilities as assigned by the Project Manager or Site Superintendent.

### **3.3 Safe Operation Requirements for Tools**

#### **3.3.1 Manual T-Post Drivers**

There shall be no use of manual fence post drivers, such as those typically used to drive T-posts, without prior approval from the Project Environmental Safety Manager (PESM) or the Vice President of Construction. Any approval of the use of such a tool shall require the implementation of an Activity Hazard Analysis (AHA) to identify and control the hazards presented by the tool. The AHA shall address appropriate PPE and position for the task in order to avoid injury to the worker.

#### **3.3.2 Tools**

The Site Superintendent shall determine the nature and quantity of tools required for the construction effort and shall ensure that adequate tools are provided in support of the schedule.

Tools may be assigned to workers or crews for the duration of their activities and shall be stored in gang boxes or other secured storage areas when not in use.

The Site Superintendent may designate certain tools to be issued from a tool control area on a daily basis. These tools should be signed out at the beginning of the work, returned to the tool control area at the end of the work, and signed back in.

#### **3.3.3 Worker Provided Personal Tools**

Workers may be required to provide personal tools of the trade for their particular work. Master mechanics, for example, may be required to provide tools required for repairs and maintenance of construction equipment and vehicles. Requirements for workers to provide their own tools shall be established based on the project requirements and shall be discussed at the Pre-Job Conference to be held in accordance with the requirements of the Labor Relations Guidelines LR-8, Pre-Job Conferences.

Any worker required or offering to provide personal tools shall be required to present a list of personal tools being provided upon reporting to the project site. The Site Superintendent shall inventory the tools against this list for verification that all listed tools have been provided. The list shall then be maintained for use in performing an inventory of the tools when the worker is to leave the site at the end of the worker's assignment and shall be the basis for any claims for loss or damage.

The Site Superintendent shall ensure that any personal tools brought onto the project site receive a safety inspection. The safety inspection shall include as a minimum, the items addressed in Section 3.3.4 of this procedure.

The Site Superintendent should ensure that secure, lockable facilities are provided for the storage of worker provided personal tools.

The worker shall be responsible for notification of lost or damaged tools immediately on discovery of the loss. The limits of the project's liability (if any) for loss or damage to personal tools provided by the workers should

be established at the Pre-Job Conference.

Use of personal tools, other than addressed above, either by manual or by TtEC nonmanual personnel, should not be allowed except as specifically authorized by the Project Manager or Site Superintendent. Project personnel should be notified that TtEC will not be liable for any theft, loss, or damage of unauthorized personal tools on the project site.

#### **3.3.4 Tool Safety Inspection**

OSHA 29 CFR Part 1926 Subpart I Tools – Hand and Power provides guidance for tool safety. All tools shall be inspected for the following minimum features by the person using the tool prior to starting the work:

- Proper general condition of tools, electrical cords, and air hoses;
- Presence and serviceability of guards and safety devices;
- Proper electrical grounding or double insulation protection;
- Power tools properly equipped with constant pressure switches;
- Tool retainers installed on pneumatic tools;
- Proper adjustment of the tool; and
- Confirming that the load rating of the tool is sufficient for the work to be performed.

Unsafe tools shall be removed from service and the Site Superintendent advised of the condition for corrective action. An Out of Service tag should be placed on all unsafe or defective tools to prevent their inadvertent use by others. These tools should be physically segregated from the acceptable tools.

#### **3.3.5 Environmental Safety and Quality Policy Implementation**

TtEC's Environmental Safety and Quality (ESQ) Policy, as included in Environmental Management System (EMS), shall be considered in the selection and utilization of construction equipment and vehicles for use in association with TtEC's construction projects.

Selection of the construction equipment and vehicles shall consider relevant TtEC-wide and project-specific significant environmental aspects, objectives, and targets, as defined in EMS and as identified by the Project Manager in the project management planning documents required under Project Initiations/Operations Procedure, PO-1, Project Management Planning.

Selection of construction equipment and vehicles may have significant impacts on the environment, either adverse or beneficial. Proper selection of the size and type of equipment and vehicles can reduce the adverse impacts from their operation.

Project procurement practices for construction equipment, parts, supplies, lubricants, and fuel shall be consistent with the principles of pollution prevention as discussed in the EMS and identified through the TIP process using CRL Procedure PO-2, Task Initiation. (For example, consideration should be given to such factors as rent versus buy options, disposable versus reusable filters, recycled versus virgin oils/fluids, recycling versus disposal of spent fluids and used parts, and fuel efficiency and economy of operation.)

Spent fluids, filters, and used parts shall be recycled to the extent practical, or otherwise disposed of in accordance with the environmental compliance elements of the Work Plan or EHS plan.

Proper utilization of construction equipment and vehicles can also reduce adverse impacts on the environment. (For example, it is TtEC's policy to not allow unattended equipment and vehicles to be left with motors running. This is not only a safety consideration; it reduces adverse environmental impacts and is generally cost effective due to reduced fuel consumption.)

#### **3.3.6 Insurance**

The Project Manager shall ensure that all construction equipment, including TtEC-owned or rental/lease equipment, is covered by appropriate insurance policies for the intended use of the equipment. Property insurance on construction equipment is normally arranged by TtEC if TtEC bears the risk of loss or if TtEC is required to arrange such insurance. However, all rented/leased construction equipment valued in excess of \$100,000, and all cranes regardless of their value shall be reported to the Administration and Compliance Department via the 'Insurance Request for Leased Equipment' (Attachment 5, and available in Tetra Links and from procurement) for specific inclusion under the TtEC property insurance policy. The procurement representative should be contacted to ensure that this occurs in each case. Notification is not required for equipment valued under \$100,000 except when the construction equipment provider requests a certificate of insurance be provided, or the equipment is a crane.

The Project Manager, usually through the designated procurement representative, should ensure that duplicate insurance coverage is not provided through the equipment provider since this will increase the rental rates. In those cases where the provider requires insurance certificates to verify coverage by TtEC, the procurement representative should be contacted to obtain the appropriate documentation.

A Vehicle Insurance Form (available from the Vehicle Insurance Coordinator, Tetra Links or procurement) shall be processed and sent to the Vehicle Insurance Coordinator for all vehicles (leased, rented, or owned) which are registered and operated off jobsites on public highways.

### **3.3.7 Receipt and Inspection**

All construction equipment shall be subject to a receipt inspection by a competent person and any Contract or otherwise required additional person(s) prior to acceptance at the project site. The inspections and tests shall be in accordance with the manufacturer's recommendations. Most vendors provide a form for notation of any existing damage to the equipment to be filled out on receipt. The equipment should be inspected carefully to determine its condition, including any damage, missing or non-functional equipment. The agreement should be used as a basis to determine that everything required (e.g., the equipment, its condition, manuals, spares, documentation of inspections, and certifications) has been provided. All discrepancies should be noted on the form. A pre-inspection of the equipment prior to transport to the Project site should be considered. Particular attention shall be given to the following items:

- All safety equipment and its condition;
- Operator (when provided) certification for the equipment;
- Posted operating and safety instructions;
- All pollution control devices and their condition;
- Safe entry and egress, with steps, ladders, handholds, and platforms provided as required, including safe access to perform routine checks, maintenance, and refueling operations;
- Leaking fluids, such as hydraulic oil, engine oil, transmission fluid, and coolant;
- Deteriorated or cracked hydraulic and coolant hoses which could result in leaks or spills; and
- Presence of the manufacturer operation and maintenance manual.

Equipment or vehicles with deficient conditions relating to safety or protection of the environment shall not be placed into service until the deficiencies have been corrected and documented.

All construction equipment shall be subject to an operational check prior to acceptance at the project site. The operational check should verify that the equipment has the capability to function as intended or as required through the full range of its intended use.

Receipt of construction equipment shall be documented; with a copy of the receipt inspection report provided to the Equipment Supervisor and to the equipment purchase order file. Documentation should include

entries for date and time of receipt, condition of equipment, mileage or engine hours at time of receipt, information on next scheduled maintenance, and a record of operating and maintenance manuals received with the equipment. Photographs or a video record of the equipment on receipt should be taken if conditions are noted that would warrant further documentation.

Construction equipment providers will often include terms and conditions on receipt documentation to be signed when construction equipment is delivered to the project site. **Project personnel requested to sign this receipt documentation shall not sign any delivery forms unless authorized to do so by Legal of the Project Manager. Further, if they are required to sign delivery forms, they shall be instructed to cross out all terms and conditions, on both the front and back of the forms, before signing.** Alternately, the person receiving the construction equipment should enter the following statement in the immediate vicinity of their signature: "In lieu of the terms and conditions set forth on this document, the Original Purchase Order (or appropriate form of agreement) terms and conditions apply to the receipt of this item(s)." These actions are necessary to avoid acceptance of additional or different terms and conditions.

Construction equipment delivered to the project site should be accompanied with operating and maintenance manuals. Cranes and lifting equipment shall include certification of satisfactory completion of annual inspection and have load charts posted in the cab. Additionally, some construction equipment may be supplied with common replacement parts, such as filters and belts, and any specialized tools required for routine operation or maintenance. (i.e. forks, buckets, lift arms, and tool carries) These items should be carefully inventoried upon receipt, and documented on the receipt inspection report. Responsibility for protection and maintenance of the construction equipment shall be verified, and all measures necessary to protect the construction equipment from damage or loss will be instituted in accordance with the agreement, operating, and maintenance manuals or other instructions as appropriate.

Disposition requirements for construction equipment found to not be in accordance with the rental/lease/sale agreement when received shall be confirmed with the vendor immediately.

A sample Equipment/Vehicle Inspection Report is included as Attachment 1 to this procedure.

### **3.3.8 Protection from Environmental Extremes**

Consideration shall be given to the environmental conditions to which the construction equipment will be exposed to during its time at the project site or during transportation. The manufacturer's instructions shall be reviewed and followed to ensure adequate protection from damage due to environmental conditions.

Adequate protection to the construction equipment's cooling system shall be verified by ensuring that the appropriate coolant/antifreeze mixture, as recommended by the manufacturer, has been used.

Appropriate procedures for operating or storing construction equipment, such as water treatment systems, shall be developed in accordance with the manufacturer's instructions. Measures such as draining and venting the system, providing auxiliary heat sources (e.g., heat tape), dry storage, shaft rotation, fluid levels, shall be taken to protect construction equipment subject to damage from environmental conditions.

Manufacturer's instructions concerning periodic operation of construction equipment shall be followed.

A means of ensuring that appropriate protective measures are instituted and performed as required should be implemented through the establishment of site procedures, logs, and/or checklists.

### **3.3.9 Equipment Inspections**

All construction equipment shall be inspected daily (when in use) for safety and operability, including manufacturer's recommended daily inspections. The inspection form/checklist should note any deficiencies for correction and serve as documentation of the inspection performance. The Equipment Supervisor shall be notified of any deficiency immediately. A Daily Equipment Inspection form, a sample of which is included as Attachment 2 to this procedure, should be filled out at the start of the shift and provided to the Equipment Supervisor. [Other supplemental forms which may be used in conjunction with Attachment 2 are the](#)

equipment specific "Pre-operation Inspection" and/or "Function Tests" forms, which are normally supplied by the equipment manufacturer. This information is usually found in the equipment's Operation Manual.

Government property control procedures usually require the implementation of a vehicle utilization log for vehicles when used on government projects; other projects should also implement a similar system for logging use of these vehicles. The log should be kept in the vehicle and an entry made for each use, including name of the driver, purpose of the trip, starting mileage, ending mileage, fuel purchased, maintenance performed, and any damage incurred. The log sheets should be transmitted as required in the contract documents and the project's documentation plan. Copies of the log sheets will be maintained and filed as discussed in Section 3.3.12 of this procedure.

A separate Daily Equipment Inspection Report should be filled out for each shift if construction equipment is utilized on multiple shifts.

The Equipment Supervisor should use the information on Daily Equipment Inspection forms to schedule any repairs or preventive maintenance required for the equipment. Equipment with missing or defective safety features should not be put in service until repairs have been performed to bring the equipment into compliance with any applicable TtEC EHS Program and/or regulatory requirements.

Implementation of the daily equipment inspections should be the subject of periodic verification inspections performed by the Project Manager, Site Superintendent, and/or the Environmental and Safety Supervisor (ESS). These periodic inspections should include verification that the required maintenance is being performed in a timely manner to ensure that unsafe conditions or impacts to the environment (e.g., spills, releases, and discharges) are not created by delays in correcting deficiencies noted on the Daily Equipment Inspection Forms.

Rigging equipment, wire rope, nylon or KEVLAR slings and chokers shall be inspected by a competent person prior to use each shift; particular attention shall be paid to the rigging condition and presence of load/certification tags.

Cranes (weight handling equipment) shall be subjected to annual and certification inspections per OSHA guidelines. Mobile and crawler cranes shall be inspected on a monthly basis; a sample checklist form is included as Attachment 3 to this procedure.

Construction equipment to be demobilized shall be given a final inspection, similar to the receipt inspection, to identify and document, by means of written description and pictures, the condition of the equipment as it leaves the project site. Where possible, a concurrent inspection by the vendor is preferred. Additionally, some projects, particularly USACE projects, require a certificate of decontamination prior to the equipment leaving the site.

### **3.3.10 Operator Qualifications**

TtEC employees operating vehicles or construction equipment on public rights of way shall be required to have in their possession a valid driver's license appropriate to the location where the item is being operated and containing the appropriate endorsement for the type of vehicle or construction equipment being operated. A Commercial Driver's License (CDL) may be required for operation of some construction equipment on public rights of way, or as a specific requirement of a client's safety program. In addition, individual states may require specific licenses or certifications for operators of certain equipment, such as forklifts, and hoisting equipment. Additionally, the client's safety program may include license or certification requirements for personnel operating equipment on their property. The contract documents should be reviewed carefully to ensure that any such requirements are incorporated into the project's Work Plan or EHS Plan. The Site Superintendent shall verify that the operator possesses the required license(s). Copies of licenses should be maintained in the on-site project employee file.

Any agreements for the rental or lease of vehicles or equipment should be reviewed for any provider's requirements for licensing or certification of operators to ensure that any such requirements are incorporated into the project's Work Plan or EHS Plan.

Operators shall be required to demonstrate their proficiency in operating the construction equipment to be assigned to them prior to being allowed to work. Crane operators shall have qualifications for the type of crane to be operated.

Operator proficiency may be demonstrated through a performance test such as those developed by the International Union of Operating Engineers, or by equipment manufacturers such as Caterpillar. These performance tests include exercises developed to demonstrate operator proficiency in various aspects of equipment operation, including daily operator inspections, ability to follow directions, ability to understand equipment limitations and operating guidelines, safety, and productivity. Also included are checklists that assist an observer in evaluating all of the various aspects of equipment operation. Attachment 4 is an example of Operator/Driver Observation Checklist.

Where it is not possible or practical to demonstrate operator proficiency through a performance test as described above, there should be a period of observation of the operator during the initial period of performance, whether the operator is a new employee or a current employee who is being assigned to a different type of equipment than previously operated on the project site. This observation may be performed by a knowledgeable member of the management team or a designated craft employee such as a foreman or steward. The above referenced checklists could be used for this observation in lieu of the performance test.

### **3.3.11 Refresher Training and Evaluation**

Refresher training in relevant topics shall be provided to Crane (as defined by OSHA 1910.180(a) operators, and Powered Industrial Truck (PIT) as defined by OSHA 1910.178(a)(1) operators prior to be allowed to continue operating when:

- The operator has been observed to operate the PIT/Crane in an unsafe manner.
- The operator has been involved in an accident or near-miss incident.
- The operator has received an evaluation that reveals that the operator is not operating the PIT/Crane safely.
- The operator is assigned to operate a different type of PIT/Crane; or
- A condition in the workplace changes in a manner that could affect safe operation of the PIT/Crane.

An evaluation of each PIT/Crane operator's performance shall be conducted at least once every three years.

Refresher training in relevant topics shall be provided to all other construction equipment operators when:

- The operator has been observed to operate the equipment in an unsafe manner.
- The operator has been involved in an accident or near-miss incident.
- The operator has received an evaluation that reveals that the operator is not operating the equipment safely.
- The operator is assigned to drive a different type of equipment; or
- A condition in the workplace changes in a manner that could affect safe operation of the equipment.

The employer shall certify that each operator has been trained and evaluated. The certification shall include the name of the operator, the type of equipment, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation.

### **3.3.12 Repairs**

All construction equipment shall be repaired as necessary and maintained in good working order. Repairs to rented/leased construction equipment shall be in accordance with the terms of the rental/lease agreement. Repairs to rented/leased and TtEC's construction equipment shall be documented and a record of the repairs maintained in the project files. Copies of the repair records are to be forwarded to the equipment yard for TtEC-owned equipment.

Construction equipment with deficiencies noted on the Daily Inspection Report should be repaired promptly.

The Equipment Supervisor, with input from the Environmental and Safety Supervisor as appropriate, should evaluate if a piece of equipment or a vehicle should be removed from service until the deficiency is corrected.

Construction equipment that develops a fluid leak such as engine oil, hydraulic oil, transmission fluid, or coolant shall be removed from service until the deficient condition has been corrected.

Construction equipment with missing or inoperable exhaust systems, including spark or flame arrestors, mufflers, and catalytic converters, shall be removed from service until the deficient condition has been corrected.

Tampering with, removal, modification, or otherwise rendering inoperable any pollution control device on construction equipment shall not be allowed except as specifically authorized by the equipment manufacturer or appropriate authority and the Project Manager or Superintendent's concurrence

Only trained, qualified personnel shall be allowed to repair equipment. The project's Work Plan should address repairs to equipment by designating required actions in the event of an equipment failure.

An Authorization for Capital Expenditure or Lease (AFCEL) is to be completed for all major repair work (i.e., \$1500.00 and over) performed on TtEC-owned construction equipment in accordance with Accounting/Finance Procedure AF-8, Fixed Assets. (Note that on some construction equipment, the cost of a specific item, a replacement tire for example, may require the processing of an AFCEL due to the item cost.)

Costs for major repairs, as well as repairs for deficiencies, to TtEC-owned construction equipment shall be charged back to the project releasing the equipment if the need for repairs is identified within 30 days of the equipment's release and removal from a project and there are indications that the repairs are needed as the result of lack of maintenance or failure of the releasing project to otherwise keep the equipment in good working order.

No repair shall be undertaken for damage covered by an insurance claim until the damage is reported to the Administration and Compliance Department and the insurer approves the repairs.

### **3.3.13 Documentation and Record Keeping**

A file shall be established and maintained for each operator which contains documentation that the operator has the proper qualifications, licenses/certificates, and training to perform his/her job function. Records may include training identified in EHS plans (e.g., OSHA, DOT, Waste Management training), vehicle operator licenses, results of site-administered proficiency testing, and any other special licenses/certificates required by state/local law or the client.

A file shall be established and maintained for each piece of construction equipment, and all records relating to that equipment shall be placed in the file, including the Receipt Inspection Report, annual inspections (for cranes), record of the date the equipment was first placed in service, Daily Equipment Inspection records, maintenance records, repair records, record of the last date that the equipment was in service, demobilization inspection report, and the decontamination certificate, if applicable. For ease of retrieval, all records pertaining to pieces of equipment should be maintained in separate folders for each piece of equipment.

Additional copies of inspection reports and records may be required to be maintained in other project files, such as the procurement files and/or the Environmental Health and Safety files, based on the project's Documentation Plan.

The Equipment Supervisor should ensure that complete and accurate record of equipment utilization, including a list of idle equipment, is provided to the Quality Control Site Manager on a daily basis for inclusion in the Quality Control Daily Report.

It may be useful to maintain equipment utilization information on a spreadsheet depending on the size of the project. Information such as equipment mobilization date, date of first use, utilization of equipment by rental

period (for example, if rental rate is based on hourly usage and is billed on a monthly cycle, there should be an entry for the number of hours the equipment was used in each billing period), scheduled equipment release date, actual release date, and demobilization date. This information may be useful in verification of vendor invoices, in review of production rates, for preparation of requests for change orders or equitable adjustment, or for backup for use in support of (or defense against) claims.

Copies of all maintenance and repair records for TtEC-owned construction equipment shall be forwarded to the TtEC Equipment Manager at the regional equipment yard on a periodic basis. This period should be monthly, and in no circumstances should it exceed quarterly. An Equipment Service Form is available from the Equipment Manager. This form shall be used to report unscheduled and preventative maintenance on TtEC-owned construction equipment.

The Equipment Manager produces a spreadsheet for TtEC-owned construction equipment that is distributed to the projects on a monthly basis. The Equipment Supervisor shall ensure that reports of mileage or meter readings and routine maintenance for all TtEC-owned construction equipment and vehicles assigned to the project are provided to the Equipment Manager for inclusion on the spreadsheet on a monthly basis. A Meter/Mileage Reading Update Form, available from the Equipment Manager, shall be used to report the required information.

The Equipment Supervisor should review the availability date included on the spreadsheet for TtEC-owned equipment and vehicles assigned to the project and inform the Equipment Manager of any required revisions to these dates.

The Equipment Supervisor shall complete an Equipment Transfer Report, available from the Equipment Manager, for all TtEC-owned construction equipment and vehicles to be mobilized to, and demobilized from the project. Copies of the Equipment Transfer Reports shall be provided to the Equipment Manager at the regional equipment yard.

There shall be no equipment disposal action (junk or sale) for TtEC-owned construction equipment or vehicles without prior notification and approval from the TtEC President.

#### **4.1 Additional Considerations**

##### **4.1.1 Control of Government Property**

Activities involving the use of Government property are to be controlled in accordance with Project Initiation/Operations Procedure PO-12, Government Property Control or by specific procedures negotiated with the Client in accordance with the contract's terms and conditions; such procedures shall be consulted where appropriate. Such activities may involve the handling or installation of Government property, whether furnished by the Government to TtEC or acquired by TtEC for use in the performance of work and for which the Government has retained title.

Government property may include construction tools and equipment purchased as a project cost, as well as permanent materials or equipment purchased for incorporation into the work. Project-specific procedures for control of Government property are to address issues relevant to the use, storage, inventory control, maintenance, and/or final disposition of the Government property.

##### **4.1.2 Spill Control and Emergency Response Dedicated Tools and Equipment**

The project's Emergency Response Plan, or Emergency Action Plan (refer to the Environmental, Health & Safety - Programs Procedure EHS 2-1, Emergency Preparedness, for discussion of when each is required) is to identify dedicated personal protective equipment and emergency response tools and equipment to be available for an emergency response to a spill or discharge of hazardous material.

Dedicated emergency response tools and equipment are to be segregated and identified for use in emergency response situations. In accordance with the requirements of EHS Procedure 2-1, Emergency Preparedness the use of dedicated emergency response tools or equipment for any other activity is not to be permitted.

#### **4.1.3 Inventory Control**

An individual should be designated as the Material Control Supervisor and should be responsible for inventory control of all tools issued from the tool control area. A log should be maintained for all tools issued and should record, as a minimum, the identification by name and employee number of the individual signing out the tool, the date and time the tool was signed out, the intended use of the tool (by area or system), an indication of when the tool is to be returned, and the time and date when the tool is returned.

Inventory control of tools assigned to individuals or crews should be performed on a daily basis as the tools are returned to the gang box or storage area. The crew foreman should be responsible for inventory control of tools assigned to the foreman's crew.

The Site Superintendent should immediately be made aware of any missing tools and should take the appropriate action to investigate and/or replace the missing tools.

#### **4.1.4 Disposition of Tools at Project Completion**

The Project Manager should make a determination of the disposition of tools remaining at the end of the project. The project may not be reimbursed by the client for the purchase of tools on certain cost reimbursable and lump sum projects. On other projects, a dollar value for individual tools may establish whether or not the client provides any reimbursement. The terms and conditions of the contract should provide direction as to the required disposition of the tools.

Tools for which the project has been reimbursed by the client are to be dispositioned in accordance with the client's preferences and the contract terms and conditions.

Tools purchased for the project as a project cost, and which are not to be turned over to the client, should be dispositioned by the Project Manager. Means of disposition may include, but not be limited to, declaring the tools surplus, sale of the tools, or providing the tools to another project. The Project Manager should consult with the appropriate Business Line Executive Vice Presidents, concerning disposition of project tools.

TtEC owned tools (i.e., not purchased as a project cost) should be dispositioned by the Project Manager based on consultation with the appropriate Business Line Executive Vice Presidents. Means of disposition of TtEC-owned tools may include, but not be limited to, declaring the tools surplus, sale of the tools, return of the tools to an equipment yard, or providing the tools to another project.

#### **4.1.5 Company-Owned Equipment**

TtEC utilizes regional equipment yard(s) for the temporary storage and maintenance of TtEC-owned construction equipment and vehicles when not currently assigned to a project. Available TtEC-owned equipment should be considered for support of a project's construction effort based on an analysis of the benefits to the project and/or TtEC. When evaluating TtEC owned equipment the requirements discussed in 4.1.6 below should be considered when making the equipment selection.

#### **4.1.6 Rental/Lease Equipment**

Agreements for rental/lease of construction equipment should be coordinated through an authorized procurement representative to ensure that appropriate terms and conditions are included in the agreement. The Scope of Work for the agreement should be developed and reviewed carefully, including review by the Site Superintendent or Equipment Supervisor for inclusion of sufficient detail in order to clearly define the

scope of work.

The Equipment Supervisor, or requisitioner if there is no designated Equipment Supervisor, should review the terms and conditions of all rental/lease agreements to determine that the following topics are adequately addressed:

- Receipt and return of the rental or leased equipment and any required accessories;
- Inspection and documentation of receipt and release;
- Provision of documentation required to be submitted, such as Occupational Safety and Health Administration (OSHA) accredited inspection reports, NDE reports, test reports (i.e. load test for cranes), typically annual inspections, and wire rope certification.
- Provision of all safety equipment and accessories, as required, such as fire extinguishers, seat belts, Roll Over Protection Structures (ROPS), Falling Object Protection Structures (FOPS), access steps, handholds, platforms, and anti two-block devices and load moment indicator (cranes);
- Provision of documentation demonstrating operator certification;
- Provision of Certificate of Compliance when required, for instance by NAVFAC P-307 Management of Weight Handling Equipment, Appendix P - Contractor Crane Requirements.
- Provision and requirements of routine and non-routine maintenance and repairs, including payment for labor, parts, filters, lubricants, and fluids;
- Documentation requirements for the above maintenance and repairs;
- Disposal/recycling requirements for used parts, filters, lubricants, and fluids;
- Items such as point of delivery, costs of delivery and return, rental charges during idle time, notification requirements for demobilization, and point of return;
- Appropriate rental rate provisions for straight time and overtime;
- Responsibility for damage to equipment;
- Insurance;
- Indemnification (if included);
- Payment for replacement of parts subject to normal wear and tear, such as tires, tracks, cutting edges, and teeth; and
- Documentation requirements required in support of invoices for basic rental rates and overtime rates, as well as labor, parts, filters, lubricants, and fluids.

Rental agreements should be structured to include normal wear and tear on the equipment in the basic rental rate. In all cases, there should be mutual agreement with the equipment vendor as to the condition of the equipment as it is delivered. This should include items such as the life expectancy of the parts subject to wear and tear, their condition on receipt (i.e., percentage of usable life remaining), and the expected condition on return of the equipment. There should be agreement on minor versus major repairs and on what constitutes normal wear and tear. Mutual agreement is essential to mitigate potential claims from vendors for excessive wear and tear.

#### **4.1.7 Mobilization of Equipment**

Mobilization of construction equipment may be a long lead time item and may require client or third party involvement or approvals to gain site access, depending on the required equipment. The Site Superintendent or Equipment Supervisor should determine the lead time required, including Contract submittal and advance notice/approval requirements, and plan for the mobilization of equipment to support the project's schedule.

Planning for mobilization of equipment should include a thorough review of Contract requirements for utilization of each equipment and site access requirements.

Documentation of certification, and OSHA compliant annual inspection, load testing, safety devices (e.g., anti two-block) installed, wire rope certification, and operator's certification for cranes (weight handling equipment) should be reviewed prior to initiating mobilization of cranes.

#### **4.1.8 Equipment Maintenance**

The Equipment Supervisor should be responsible for administration of a construction equipment maintenance program for the project. A spreadsheet of all TtEC-owned equipment, titled the Status of All Project Equipment, is maintained by the Construction Department providing notification of the scheduled maintenance requirements for each piece of equipment. Either this spreadsheet, or a project specific spreadsheet, should be maintained and statused on a periodic basis. Specific maintenance requirements may also be contained in specific contract negotiated property procedures or in other TtEC corporate procedures.

As construction equipment is received on site, it should be added to the spreadsheet for tracking of the required maintenance.

A review of the scheduled maintenance should be performed for all construction equipment to be used in the Exclusion Zone to determine the desirability of performing any upcoming scheduled maintenance prior to placing the equipment in service. It may be difficult and expensive to perform the maintenance under the conditions required in the Exclusion Zone, or to decontaminate the construction equipment in order to perform the maintenance under clean conditions. When the maintenance of equipment in the Exclusion Zone is anticipated, the Site Superintendent should ensure that qualified personnel are available with the appropriate medical clearances and certifications to work in the Exclusion Zone.

#### **4.1.9 Construction Equipment Safe Operation Requirements**

Standards for safe operation of equipment are contained in the documents identified herein, inclusive and in particular of the requirements for safe operation of lifting and rigging equipment and weight handling equipment. The Contract typically will specify certain documents/codes to be followed for the project. Accessibility of the identified documents is provided in section 5.0 References.

The United States Army Corps of Engineers (USACE) Safety and Health Requirements Manual, EM 385-1-1, Chapters 16, 17, and 18, provide guidance concerning the safe operation of construction equipment.

Safe operation of earth drilling equipment is addressed in the Environmental Health & Safety-Program Procedure EHS 6-2, Drill Rigs.

Safe operation of hand and power tools is addressed in OSHA standard 29CFR Part 1926 Subpart I.

Safe operation of cranes, derricks, hoists, elevators and conveyors is addressed in OSHA standard 29CFR Part 1926 Subpart N.

Safe operation of motor vehicles, mechanized equipment and marine operations is addressed in 29CFR Part 1926 Subpart O.

Rollover protective structures and overhead protection is addressed in 29CFR Part 1926 Subpart W.

The American Society of Mechanical Engineers (ASME) provides guidance in the B30 committee volumes – Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings.

The United States Department of Energy (DOE) provides guidance for safe lifting operations in Technical Standard DOE-STD-1090 – Hoisting and Rigging.

The United States Navy publication NAVFAC P-307 – Management of Weight Handling Equipment includes requirements for Contractor Cranes (see appendix P). Navy facilities issue Instructions

specific to particular facilities such as 'NAVSHIPYDPUGET INSTRUCTION 11262.4A' which provides requirements for weight handling equipment at all Navy facilities within the Puget Sound.

#### 4.1.10 Demobilization of Equipment

Construction equipment should be demobilized when no longer required for the work. The Executive Vice President of Construction should be provided with a status of TtEC-owned construction equipment and scheduled release dates in order to coordinate availability of equipment with other projects.

The Project Manager or designee should request demobilization instructions from the Executive Vice President of Construction or designee to determine the location to receive TtEC-owned equipment.

Construction equipment leaving the Exclusion Zone of a remediation construction project will be decontaminated in accordance with the requirements of the Environmental Health & Safety-Programs, Procedure EHS 3-4, Site and Contamination Control, and the site specific EHS Plan.

Individual state regulations may require cleaning of construction equipment leaving a site, not limited to remediation construction, in order to control the spread of microorganisms contained in the soil. Such requirements are to be identified in the project EHS plans.

#### Please Describe Your Reference Here

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1. Accounting/Finance Procedure AF-8, Fixed Assets
2. ASME B30 committee publications "Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings" available at [www.ihserc.com](http://www.ihserc.com) Note that this is a commercial subscription and requires a User ID and Password available from the TtEC Librarian
3. DOE Technical Standard DOE-STP-1090 Hoisting and Rigging available at [www.directives.doe.gov](http://www.directives.doe.gov) (select the Tech Standards tab, select DOE Technical Standards, select Approved Standards and select DOE\_STD\_1090 from the menu)
4. Environmental, Health & Safety - Programs Procedure EHS 2-1, Emergency Preparedness
5. Environmental, Health & Safety -Programs Procedure EHS 3-4, Site and Contaminant Control
6. Environmental, Health & Safety -Programs Procedure EHS 6-2, Drill Rigs
7. Environmental Management System (EMS)
8. Labor Relations Guidelines LR-8, Pre-Job Conferences
9. NAVFAC P-307 Management of Weight Handling Equipment, Available via <http://www.safetycenter.navy.mil/instructions/osh/navfacP307.pdf#search=%22NAVFAC%20P-307%22>
10. The OSHA publications below are available at [www.osha.gov/](http://www.osha.gov/) select Regulations, select OSHA Regulations (Standards - 29 CFR), select Part 1926 Safety and Health Regulations for Construction
11. OSHA 29 CFR Part 1926 Subpart I Tools - Hand and Power
12. OSHA 29 CFR Part 1926 Subpart N Cranes, Derricks, Hoists, Elevators and Conveyors
13. OSHA 29 CFR Part 1926 Subpart O Motor Vehicles, Mechanized Equipment and Marine Operations
14. OSHA 20 CFR Part 1926 Subpart W Rollover Protection Structures Overhead Protection
15. OSHA 29 CFR Part 1910.178 Powered Industrial Trucks
16. OSHA 29 CFR Part 1910.180 Crawler Locomotive and Truck Cranes
17. Project Initiation/Operations Procedure PO-1, Project Management Planning
18. Project Initiation/Operations Procedure PO-2, Task Initiation
19. Project Initiation/Operations Procedure PO-12, Government Property Control

**Please Provide a Description of the Attachment**

- 1. Sample Equivalent/Vehicle Inspection Report
  
- 2. Sample Daily Equipment Inspection Form
  
- 3. Mobile and Crawler Crane Monthly Checklist
  
- 4. Operator/Driver Task Observation Checklist
  
- 5. Insurance Request for Leased Equipment

**Place Your Attachments Here**



CP-7 Att-1 -mod 20090924.doc



CP-7 Att-2 Daily Equip Insp\_m



CP-7 Att-3 FJ.doc



CP-7 Att-4 Operator Observati



CP-7 Att-5 FJ.doc

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TETRA TECH EC, INC.

### Equipment/Vehicle Inspection Report

Date: \_\_\_\_\_ Unit Number: \_\_\_\_\_ Description: \_\_\_\_\_

\_\_\_\_\_ Miles or \_\_\_\_\_ Hours: \_\_\_\_\_ MFG: \_\_\_\_\_

Unit to be taken from: \_\_\_\_\_ to: \_\_\_\_\_

	Good	Satisfactory	Repair Req.	N/A		Good	Satisfactory	Repair Req.	N/A
1. Tires/Track <u>%<sup>1</sup></u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17. Interior	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Brakes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18. Glass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Steering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	19. Wipers/Review Mirrors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Undercarriage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	20. Heater/AC/Defroster	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Suspension	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	21. Safety Equipment/Belts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Engine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	22. Signal Lights	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Drive Train	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	23. Mounted Equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Fuel System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	24. Mounted Attachments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Cooling System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	25. Blade/Bucket	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Electrical System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	26. Boom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Exhaust System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	27. Outriggers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Hydraulic System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	28. Fire Ext./First Aid Kit <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Transmission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	29. Horn/Backup Alarm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Clutch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	30. <u>Manufacturer Operating</u> Manual	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Body	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	31. <u>Head/Tail/Brake Lights</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. ROP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	32. <u>Cleanliness</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<sup>1</sup> Note estimated percentage of tread/track usefulness remaining

<sup>2</sup> Fire Ext./First Aid Kit and all items in the cab and/or bed must be secured

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Inspected By: \_\_\_\_\_

DISTRIBUTION: (1) Sent with equipment (2) Equipment Supervisor (3) PO File (4) Originator  
EQUIPMENT TRANSFER REPORT MUST ACCOMPANY THIS FORM



TETRA TECH EC, INC.

### DAILY EQUIPMENT INSPECTION

PROJECT \_\_\_\_\_  
 MANUFACTURER TYPE \_\_\_\_\_  
 UNIT # \_\_\_\_\_ MODEL \_\_\_\_\_ DATE \_\_\_\_\_  
 ENGINE HRS/MILEAGE \_\_\_\_\_ / \_\_\_\_\_ SHIFT \_\_\_\_\_

Check appropriate column and describe correction needed.

	If Good (✓)	NA	Correction Needed
Steering Mechanisms <sup>1*</sup>	_____	_____	_____
Service Brakes <sup>2</sup>	_____	_____	_____
Emergency Brakes <sup>1</sup>	_____	_____	_____
Parking Brake <sup>1</sup>	_____	_____	_____
Transmission & Controls	_____	_____	_____
Suspension & Springs	_____	_____	_____
Hydraulic Leaks	_____	_____	_____
Exhaust System	_____	_____	_____
Warning Gauges	_____	_____	_____
Windshield <sup>1</sup> & Wipers	_____	_____	_____
Lights (Head & Tail)	_____	_____	_____
Brake Lights <sup>1</sup>	_____	_____	_____
Mirrors	_____	_____	_____
Seat and Seat Belts <sup>1</sup> (w/ ROPS)	_____	_____	_____
Tires/Tread <sup>1</sup>	_____	_____	_____
Regular Horn	_____	_____	_____
Audible Back-up Alarm <sup>1</sup>	_____	_____	_____
Steps, Hand-holds	_____	_____	_____
Fire Extinguisher	_____	_____	_____
Engine Coolant	_____	_____	_____
Engine Oil	_____	_____	_____
Hydraulics & Operating Controls	_____	_____	_____
Fenders/Mudflaps	_____	_____	_____
Heater/defroster	_____	_____	_____
<u>All items in cab or bed secured</u>	_____	_____	_____
<u>Cleanliness inside and outside</u>	_____	_____	_____

**Remarks:**

<sup>1</sup> Items required to be operational by OSHA 1926.602 before use.

<sup>2</sup> Service brake must be capable of stopping and holding equipment fully loaded. \_\_\_\_\_

\_\_\_\_\_  
 Operator Name (Printed) Operator Signature  
 Review : Superintendent \_\_\_\_\_

Date Repairs or adjustments completed: \_\_\_\_\_  
 Equipment Supervisor/Mechanic: \_\_\_\_\_



# MOBILE AND CRAWLER CRANE MONTHLY CHECKLIST

Crane Number / ID \_\_\_\_\_

Date \_\_\_\_\_

Project Name/No: \_\_\_\_\_

Item	Consideration	Comments
Crane Structure	Cracks, Corrosion, Deformation	
Foundations to support loads	Cracks, Settlement	
Booms	Cracks, Corrosion, Deformation	
Bolts & Rivets	Tightness, Corrosion	
Boom Angle Indicator & Chart	Accuracy, Visibility	
Load Indicator (s)	Accuracy	
Anti-Two Block Device	Functional	
Engine or Motor	Performance & Safety Compliance	
Chain & Sprocket	Wear and Stretch	
Pawls or Dogs	Wear, Cracks, Distortion	
Pins, Shafts & Axles	Wear, Cracks, Distortion	
Bearings & Rollers	Wear, Cracks, Distortion	
Gears	Wear, Cracks	
Tires & Wheels	Excessive Wear, Damage	
Wire Ropes/Lines	Condition, Lay	
Main Drum Brake	Function, Adjustment	
Lining	Excessive Wear	
Drum Braking Surface	Wear, Cracks, Distortion	
Linkage & Pins	Wear, Cracks, Distortion	
Actuating Cylinders & Fittings (if any)	Leakage or Deterioration	
Auxiliary Drum Brake	Function, Adjustment	
Lining	Excessive Wear	
Drum Braking Surface	Wear, Cracks, Distortion	
Linkage & Pins	Wear, Cracks, Distortion	
Actuating Cylinders & Fittings (if any)	Leakage or Deterioration	
3 <sup>rd</sup> , Drum Brake (if any)	Function, Adjustment	
Lining	Excessive Wear	
Drum Braking Surface	Wear, Cracks, Distortion	
Linkage & Pins	Wear, Cracks, Distortion	
Actuating Cylinders & Fittings (if any)	Leakage or Deterioration	
Boom Hoist Brakes	Function, Adjustment	

## MOBILE AND CRAWLER CRANE MONTHLY CHECKLIST

Crane Number / ID \_\_\_\_\_

Date \_\_\_\_\_

Project Name/No: \_\_\_\_\_

Item	Consideration	Comments
Lining	Excessive Wear	
Drum Braking Surface	Wear, Cracks, Distortion	
Linkage & Pins	Wear, Cracks, Distortion	
Actuating Cylinders & Fittings (if any)	Leakage or Deterioration	
Travel Brake or Locks	Function, Adjustment	
Lining	Excessive Wear	
Drum Braking Surface	Wear, Cracks, Distortion	
Linkage & Pins	Wear, Cracks, Distortion	
Actuating Cylinders & Fittings (if any)	Leakage or Deterioration	
Lead Block	Function	
Hooks	Cracks, Distortion	
Hook, Swivel	Cracks, Wear, Function	
Sheaves	Wear, Cracks, Distortion, Rope Fit	
Computers	Calibrated	
Counterweight System	Attaching Linkage OK	

---

Print Name

Signature



# OPERATOR/DRIVER TASK OBSERVATION CHECKLIST

Project Name \_\_\_\_\_ Project Number \_\_\_\_\_  
 Operator's Name \_\_\_\_\_ Observer's Name \_\_\_\_\_  
 Date of observation \_\_\_\_\_ Type/make of equipment operated \_\_\_\_\_

Operating Safety Observations	S	U	NA	Comments
<b>A. Pre-use inspection prior to starting</b>				
1. Conducts daily pre-use inspection.				
2. Mounts & dismounts carefully-3 point contact.				
3. Uses the seat belt all times while seated. Sounds horn before starting engine.				
4. Checks equipment warning devices.				
5. Checks hydraulic systems (if so equipped). Ensures system is filled and free from leakage.				
6. Checks air system (if so equipped). Ensures all connections are tight.				
7. Checks engine oil level. Ensures all plugs, filler caps, and other fittings are secure and not leaking.				
8. Checks for broken, missing, excessively worn or damaged parts, and reports immediately.				
9. Checks tires. Looks for serious cuts, bulges, irregularities and abnormal wear. Checks inflation pressures and keeps valve caps in place. Checks for tires rubbing.				
10. For dump trucks, checks front wheel seal oil levels.				
11. Checks fuel level and for fuel system leaks.				
12. Coolant check—Should never open a hot system or pour cold coolant into radiator if the engine is very hot.				
13. For safe visibility, cleans the windshield, mirrors and light lenses.				
14. For articulating machines, checks to ensure that the steering frame lock or link have been removed and properly stored.				
15. Checks for and maintains safe access to the cab (3 point contact). For safe mounting, clears the steps, grab rails, and floor and seat of mud and water.				
16. Secures tools and keeps the floor free of debris.				
17. For safe operation wipes steering wheel, foot pedals, hand levers and knobs clean of oil and grease.				
18. Checks first aid kit and fire extinguisher. Reports missing items to the foreman or supervisor.				
19. Checks equipment for warning tags.				
<b>B. Starting</b>				
1. Mounts & dismounts carefully-3 point contact.				
2. Uses the seat belt at all times while seated. Sounds horn before starting engine.				
3. Checks equipment warning devices.				
4. Uses job specific PPE (e.g., hard hats, safety shoes, safety glasses, overalls, gloves, traffic vests, and ear protection).				
5. Ensures the bowl, bucket, etc. is on the ground.				
6. For starting, checks all controls to be sure they are in proper position.				
7. Does not crank an electric starter for more than 30 seconds. Allows two minutes to cool prior to next attempt.				
8. For steering safety, tests before moving. Turns the wheels to full left and full right.				
9. Checks service and parking breaks for proper operation.				
10. Checks the backup alarm.				
11. Ensures head lamps and safety lighting are in working order.				



Operating Safety Observations	S	U	NA	Comments
<b>C. Operation</b>				
1. Before moving, places the bucket, bowl, blade, etc., into the transport position and secures all accessory equipment.				
2. Obeys traffic & other posted/published site safety practices & rules.				
3. Maintains control of equipment at all times.				
4. Gives right-of-way to loaded machines or trucks.				
5. Minimizes engine overspeed on downgrades & when shifting.				
6. Does not transport passengers without proper provisions.				
7. Does not engage in horseplay.				
8. Crosses ditches at an angle, proceeding slowly.				
9. Avoids large obstacles, deep holes & soft edges.				
10. Slows down before turning.				
11. Stays in gear on a downgrade.				
12. When running across a hillside, proceeds slowly. Never turns sharply uphill or downhill.				
13. Obeys flagmen & spotter signals.				
14. Maintains safe stopping distance behind other equipment.				
15. Shifting				
a. Always stops the machine/truck and runs the engine at low idle speed to shift from forward into reverse.				
b. Downshifts one speed range at a time.				
c. Applies the retarder and/or service brakes to reduce speed before entering sharp turns, fill areas, and downgrades.				
d. For machines, always leaves the shift lever in neutral position when stopped.				
16. Braking				
a. Avoids applying brake continuously on a downgrade unless system is so designed.				
b. Uses the engine for additional brake force-or, if so equipped, the auxiliary retarder.				
c. Anticipates grade and selects proper gear range accordingly.				
d. Brakes firmly in one application. Avoids fanning the brake pedal.				
e. Uses each brake system only for its intended purpose.				
17. Turning				
a. Does not cut corners too close when making sharp turns.				
b. Maintains engine speed high enough for normal steering.				
c. Downshifts when necessary or appropriate.				
d. For machines, carries the load as low as conditions permit to maintain stability.				
18. Hauling				
a. Regulates speed to road conditions. Reduces speed before turning. Avoids over speeding the engine.				
b. Downshifts when approaching a downgrade. Downshifts when necessary on an upgrade to avoid stalling the engine.				
c. Obeys traffic rules and spotters.				
19. Parking Precautions				
a. Selects level ground whenever possible.				
b. When parking on a grade, positions equipment at right angles to the slope; and sets parking brake if so equipped in addition to lowering bowl, bucket, etc.				
c. Parks a reasonable distance from other equipment.				
d. When parking on haul roads, picks the safest place, where the equipment is visible from both directions.				



Operating Safety Observations	S	U	NA	Comments
20. Demonstrates proficiency through smooth operation of controls (e.g., speed of operation appropriate for the conditions, not jerky or hesitant).				
21. Maintains eye contact with other operators, drivers, and ground personnel.				
22. Responds appropriately to signals from flaggers, spotters, operators directing equipment movements.				
23. Stops operation when ground personnel are out of line-of-sight.				
24. Positions and orients machine for safe operation (e.g., safe distance from edge of excavations, tracks perpendicular to excavation, clear distance maintained to fixed obstructions).				
25. Barricades, cones, tape set up to maintain clear zone within swing radius of counterweight.				
26. Maintains safe work area (e.g., windrow at edge of stockpiles, safe slopes).				
<b>D. Shutdown</b>				
1. Lowers the bowl, bucket, etc. to the ground. Lowers and secures the bed on dump trucks.				
2. Reduces engine speed. Sets parking brake.				
3. On machines, places transmission in neutral and locks shift lever if so equipped.				
4. Allows hot engine to cool gradually before stopping it.				
5. Secures equipment to prevent unauthorized starting and movement.				
6. Bleeds the air tanks, if so equipped.				
7. Dismounting—doesn't jump off, uses handrails and steps, and faces the machine/truck when getting off.				
8. Warning tags—attaches appropriate warning tags to steering wheel to prevent accidents.				
<b>E. Overall Appraisal</b>				
Overall appraisal of operator/driver				

S = Satisfactory

U = Unsatisfactory

NA = Non applicable

Note: For unsatisfactory observations also indicate the immediate corrective action taken (e.g., training, verbal or written warning, or reassignment).

**Tetra Tech EC, Inc.**  
**Insurance Request for Leased Equipment**

FROM:

LOCATION:

TO: **Dan Fisher**

LOCATION: **Morris Plains**

1.	IS THIS ITEM A LICENSED VEHICLE? IF YES, PLEASE PROCESS THE "TTECIVEHICLE INSURANCE REQUEST FORM"	
2.	DATE FORM COMPLETED	
3.	REQUESTOR NAME, PHONE NUMBER AND OFFICE LOCATION	
4.	JOB SITE CONTACT (Name and Phone Number)	
5.	PROJECT NAME	
6.	LESSOR'S COMPLETE NAME AND ADDRESS	
7.	TERM OF THE LEASE (please be specific, i.e., 6/15/98 to 6/15/99)	
8.	TYPE OF EQUIPMENT & SERIAL NUMBER <b>**Please contact Dan Fisher ASAP regarding insurance for cranes**</b>	
9.	DECLARED VALUE OF EQUIPMENT	
10.	CHARGE NUMBER (FOR VALUE OF EQUIPMENT OVER <b>\$500,000</b> )	
11.	HAS LESSOR SPECIFICALLY REQUESTED LOSS PAYEE STATUS? IF YES, PLEASE SPECIFY DATE DUE.	

**PO/Subcontract attached**   
**Terms and conditions attached**

*If guidance is needed, please call Dan Fisher @ (973) 630-8198, Version 6.*

**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.

<b>Status:</b>	Complete	<b>Approved By:</b>	John DeFeis
		<b>Title:</b>	Event Reporting and Investigation
<b>Version Date - Type:</b>	12/09/2009 - Revised	<b>Original Issue</b>	02/01/95
		<b>Date:</b>	
<b>Category:</b>	Company Procedures	<b>Sections:</b>	ESQ - Environmental Health & Safety Programs
<b>Sub-Category:</b>	Departmental/Discipline	<b>Document</b>	Procedure
		<b>Type:</b>	
<b>Keyword Index:</b>	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	<b>Document</b>	Skip Parry
		<b>Owner</b>	

## 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:

- 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 PESM 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 PESM'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**

<u>EVENT TYPE</u>	<u>SUPERVISOR NOTIFIES...</u>	<u>TIMING<sup>1</sup></u>	<u>... WHO NOTIFIES</u>	<u>TIMING<sup>1</sup></u>
Spill/release or Permit Exceedence	ESS	Immediately	PESM and Director, EHS Services	Immediate! external rep 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)	Immediate! external rep required
Fatality, Hospitalization of 1 or more persons, Fire, or Explosion	ESS	Immediately	PESM and Director, EHS Services 0 OSHA reporting (See 3.5.1) Insurance <a href="#">AIG through Chartis</a> @ 1-800-910-2667 (Company personnel only) (Not required inside Washington State)	Immediate! Immediate! Immediate!
	Project Manager	Immediately	Area/Program Manager VP Construction Client	Immediate! Immediate! Immediate!
	ESS	Immediately	PESM and Director, EHS Services Insurance <a href="#">AIG through Chartis</a> @ 1-800-910-2667 (Not required in Washington State)	Same day Same day Same day
Confirmed or Potential OSHA Recordable	Project Manager	Immediately	Area/Program Manager VP Construction, VP Remediation, VP C&E, COO	Same day Same day 24 hours or by contract

			Client, if required	
Equipment/Property Vehicle Damage	ESS	Immediately	PESM and Director, EHS Services	24 hours
	Project Manager	Immediately	Client (client property)	Immediate
			Client (other property, if required)	24 hours
			Equipment Manager	24 hours
Potential Insurance Claim, other than Worker's Compensation	Project Manager	Immediately	Area/Program Manager	24 hours
			VP Construction	24 hours
			Law Department and Procurement	24 hours
Office Events	ESC	Immediately	Operations Manager	24 hours
Quality Events	Project Manager	Immediately	Director, EHS Services	
			Project QC Manager	Same Day
			Director of Quality Programs	24 hours

<sup>1</sup>Timing - 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 PESH to implement the spill/release and permit exceedance 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 below<sup>1</sup>

#### **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

TIEC'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

1. Attachment A - [Event](#)/Near Miss Report and Investigation
2. Attachment B - Quality [Event](#) Report Form
3. Attachment C -[Event](#) Sketch

### Place Your Attachments Here



EHS 1-7, Att A, 2007.doc



EHS 1-7, Att B, 2007.doc



EHS 1-7, Att C, 2007.doc

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EHS 1-7 ATTACHMENT B



	<b>HAZARD REPORT AND SUGGESTION FORM</b>	<b>Hazard Type:</b> Condition <input type="checkbox"/> Practice <input type="checkbox"/>	
<p><i>The form is intended to provide a means for any employee to report hazards in the work place, or to make suggestions that will improve safety, environmental protection, quality or productivity. It may also be used to report Near Miss incidents with a low loss potential. If desired, the Report may be submitted anonymously. Please provide enough information to allow an effective evaluation of the hazard or suggestion. Your input is appreciated and all suggestions will be evaluated. If your name is included, we may request further information, and will inform you of the disposition. Thank You!</i></p>			
<b>DESCRIBE CONDITION OR PRACTICE:</b>			
<b>SUBMITTED BY (OPTIONAL):</b>		<b>DATE:</b>	
<b>IMMEDIATE CORRECTIVE ACTION COMPLETED:</b>		<b>COMPLETED BY</b>	
		<b>COMPLETION DATE</b>	
<b>RECOMMENDATIONS FOR FURTHER CORRECTIVE ACTION</b>	<b>RESPONSIBLE PERSON</b>	<b>TARGET DATE</b>	
		<b>COMPLETION DATE</b>	
<b>FOR OFFICE USE ONLY</b>			
<b>POTENTIAL INCIDENT TYPE:</b>			
Slip/Trip/Fall	Strain/Overexertion	Fire	
Struck by or against	Chemical Exposure	Environmental Release	
Caught in, between or under	Property damage	Other (Explain)	
Project/Office/Location: _____			
Report Given To: _____		Date: _____	
Tracking Number: _____			

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.

<b>Section 1, General Information</b>		
Short Description/Title Below: (limited to 125 characters). This is the description that will appear in the database listing.		
<b>Type of Event/Near Miss (check all that apply):</b>		
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?
A motor vehicle accident?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Property damage (>\$500)?
A repetitive motion injury?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Spill/release?
A fall?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Permit exceedence?
Being struck by something?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Event Information</b>		
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	
<b>What was the employee doing, or what was happening, just before the event occurred?</b> 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

<b>What happened?</b> 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.		
<b>Section 2, Affected Employee Information</b>		
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		
<b>Section 3, Injury/Illness Information (If not applicable, check here <input type="checkbox"/> and go to Section 4)</b>		
Nature of injury or 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		
<b>Section 4, Vehicle and Property Damage Information (If not applicable, check here <input type="checkbox"/> and go to Section 5)</b>		
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**

<b>Section 5, Environmental Release (If not applicable, check here <input type="checkbox"/> and go to Section 6)</b>		
<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:		
<b>Section 6, Notifications</b>		
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:		
<b>Section 7, Persons Preparing Report</b>		
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

<b>Section 8, Attach Sketches or Photos</b>		
<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.		
<b>Section 9, Investigative Report</b>		
<b>Date Information:</b>		
Date of event:	Date of investigative report:	
<i>Event Cost:</i>		
Other event costs: \$	WC claim value: \$	Estimated loss: \$
<b>Cause Analysis</b>		
Was the activity addressed in an AHA? <input type="checkbox"/> Yes (attach applicable section) <input type="checkbox"/> No		
<b>Immediate Causes</b>		
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 <i>immediate cause</i> 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 <i>basic cause</i> 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**

<b>Remedial Actions</b>			
Actions	Person Responsible	Target Date	Completion Date
1.	1.		
2.	2.		
3.	3.		
4.	4.		
<b>Section 11, Persons Performing Investigation</b>			
Investigator's name:		Date:	
Investigator's name:		Date:	
Investigator's name:		Date:	
<b>Management Review</b>			
<i>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.</i>			
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):
<b>Enter Short Description/Title (limited to 125 characters) below.</b> This is the description that will appear in the database listing.			
<b>Issue Summary:</b> 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			
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"/> 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 <b>immediate cause</b> 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 <b>basic cause</b> 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.		
<b>Section 5, Persons Performing Investigation</b>			
Investigator's name:		Date:	
Investigator's name:		Date:	
Investigator's name:		Date:	
<b>Management Review</b>			
<b>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.</b>			
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 3-3 ATTACHMENT C  
TETRA TECH EC, INC.  
PESM INSPECTION CHECKLIST—AIR QUALITY**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

<b>Permitting Applicability/Exemption</b> <i>(Please complete each line in this section)</i>		
		<p><b>1. State/Local Pre-Construction Permit.</b> The project modified a point or nonpoint air emissions source for which a permit modification must be obtained from the state/local regulatory agency. (State/regional/local air regulations) <i>Note: regulated sources may include passive emission sources such as landfills, bioremediation piles, etc.</i></p>
		<p><b>2. PSD Permit.</b> Project modified a major source which has the potential to emit 250 tpy (or 100 tpy if source is one of 28 listed sources) of any regulated air pollutant. Project has potential to emit in "significant amounts" criteria pollutants for which the area is in attainment (NO<sub>x</sub>, SO<sub>2</sub>, PM<sub>10</sub>, VOC, CO, lead). Project meets PSD permit conditions (40 CFR 52.21, State/local air regulations)</p>
		<p><b>3. Non-attainment Area.</b> Project involves the modification of a "major source" which emits a "significant" amount of criteria pollutants for which the area is designated non-attainment. The project obtained permit mod &amp; meets conditions in the pre-construction permit (40 CFR 52, State/local regulations) <i>Note: definitions for major source and significant amounts of pollutants will vary depending upon the classification of the nonattainment area.</i></p>
		<p><b>4. NSPS Sources.</b> Project involves modification of a source that is subject to NSPS standards. Project obtained permit mod &amp; meets permit conditions. (40 CFR 60)</p>
		<p><b>5. Hazardous Air Pollutant Sources.</b> Project involves the modification of a source that is listed as a HAP source and has the potential to emit 10 tpy of a single HAP or 25 tpy of a combination of HAPs. Project has obtained proper approval from regulatory agency. (40 CFR 63)</p>
		<p><b>6. Title V Permit.</b> Project involves the operation of a source which has the potential to emit 100 tpy of any regulated air contaminant, or 10 tpy of a single HAP or 25 tpy of combination of HAPs, or source is subject to NSPS, PSD or nonattainment area permitting. Project complies with permit requirements. (40 CFR 70, State/local air regulations)</p>
		<p><b>7. State Toxic Air Pollutants.</b> Project involves the modification of a source of toxic air pollutants that is regulated by state/local agency and proper approval has been obtained. (State/local regulations)</p>


**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
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<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>
	<p><b>8. Permit Exclusion/Exemption.</b> Project involves modification of a point or nonpoint source that emits regulated air pollutants and the state/local air regulations specifically exempt the project activities from obtaining a permit/approval or an exemption has been obtained. Documentation exists in the project files recording the exemption. (State/local regulations)</p>	
	<p><b>9. Permit Equivalency.</b> Project is being conducted pursuant to CERCLA. "Substantive" requirements of ARARs, permits/approvals have been documented in project plans/correspondence and project is implementing substantive requirements.</p>	
<p><b>Equipment/Pollution Control Devices</b> (<i>Applies if project has equipment that generates or controls air pollution.</i>)</p>		
	<p><b>10. Equipment, Process, Materials, Process Rates.</b> Permit terms/conditions reflect current equipment, process, materials, and process rates. If not, note differences and determine if permit modification is required.</p>	
	<p><b>11. Pollution Control Devices.</b> Air emissions source includes control technology. Evaluation of the following was conducted and determined to be in compliance:</p> <ul style="list-style-type: none"> <li>a. Verification was made that control technology as specified in permit/regulations is in place and operating properly.</li> <li>b. Inspections of control equipment are being conducted in accordance with permit terms or SOPs. Documentation of inspections is recorded in logbooks/operating record/project files.</li> </ul>	
	<p><b>12. Treatment Residues.</b> Control equipment generates treatment residues which have been properly characterized, managed, and/or disposed of. <i>Complete applicable waste checklists.</i></p>	
<p><b>Emissions Monitoring and Testing</b> (<i>Applies if project must conduct air emissions monitoring or testing.</i>)</p>		
	<p><b>13. Continuous or Periodic Emissions Measurement.</b> Emissions from project sources are subject to continuous/periodic emissions measurements. Evaluation of the following was conducted and determined to be in compliance:</p> <ul style="list-style-type: none"> <li>a. Verification was made that emissions measurements comply with regulatory requirements.</li> <li>b. Monitoring data was reviewed and meets emissions limits specified in regulations/permit conditions.</li> <li>c. Recordkeeping to regulatory agency, if required, is being conducted. Documentation exists in project files.</li> </ul>	


**ATTACHMENT C**  
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Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<p><b>14. Stack Testing.</b> Project is required to conduct stack testing in accordance with federal, state, or local regulations and/or permit. (40 CFR 51 and 52, State/local regulations)</p> <ul style="list-style-type: none"> <li>a. Testing was conducted as specified in regulations/permit.</li> <li>b. Notification to regulatory agency, if required, was performed/documented.</li> <li>c. Reporting of testing results was performed, if required.</li> <li>d. Testing verified that source was in compliance with regulatory/permit requirements.</li> </ul>	
	<p><b>15. NSPS Sources.</b> Sources subject to NSPS have specific Continuous Emission Monitoring (CEM) &amp; performance testing requirements. An evaluation of the following was conducted and found to be in compliance:</p> <ul style="list-style-type: none"> <li>a. Source-specific CEM performance testing specified in applicable Subpart.</li> <li>b. Notification prior to startup of CEM/opacity demonstration was provided to agency. (40 CFR 60.7)</li> <li>c. If excess emissions occurred, quarterly reports were submitted to agency. (40 CFR 60.7)</li> <li>d. CEM requirements in 40 CFR 60.13 are being met.</li> <li>e. General performance testing requirements specified in 40 CFR 60.8 has been met.</li> </ul>	
	<p><b>16. HAPs/NESHAP Sources.</b> Sources subject to HAPs/NESHAPs have specific Continuous Monitoring System (CMS) &amp; performance testing requirements. (40 CFR 61 and 63) An evaluation of the following was conducted and found to be in compliance:</p> <ul style="list-style-type: none"> <li>a. Source-specific CEM/performance testing specified in applicable Subpart.</li> <li>b. Notification prior to performance test/startup of CEM was provided to agency. (40 CFR 63.7/63.8)</li> <li>c. CMS requirements in 40 CFR 63.8 are being met, including CMS quality control program.</li> </ul>	
<b>Emissions Limits</b> <i>(Please complete each line in this section)</i>		
	<p><b>17. General Regulatory Emissions Limits.</b> Emissions for project source comply with all applicable federal, state, local emission limits. This includes point source emissions from units, fugitive emissions from unit and material handling equipment, and toxic air pollutants. (Federal/state/local regulations)</p>	
	<p><b>18. Permit-specific Emissions Limits.</b> Emissions from project sources comply with permit-specific emissions limits.</p>	
	<p><b>19. NSPS Source-Specific Emissions Limits.</b> Project is in compliance with NSPS emissions limits. (40 CFR 60, Subparts)</p>	


**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST—AIR QUALITY**

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<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

		<b>20. HAPs/NESHAPs Source-Specific Emissions Limits.</b> Project is in compliance with HAPs/NESHAPs emissions limits. (40 CFR 61/63, Subparts)	
<b>Reporting/Recordkeeping</b> <i>(Please complete each line in this section)</i>			
		<b>21. Registration.</b> Emissions source is required to register with state/local agency. Project files document that registration has been performed. (State/local air regulations)	
		<b>22. Emissions Inventory.</b> Emissions inventory must be submitted to state/local agency and project files document that emissions inventory has been submitted. (State/local air regulations)	
		<b>23. Permit Posting.</b> Permit is posted conspicuously, if required. (State/ local air regulations)	
		<b>24. Reporting of Startup/Shutdown/Malfunctions/Emissions Excesses/Other.</b> Project files contain documentation that startup/shutdown/malfunctions/excess emission (as applicable) were reported to State/local/EPA. (40 CFR 60, 61, 63, state/local regulations)	
		<b>25. Recordkeeping.</b> All permit/agency required records are maintained in the project files. This may include data from CEM, monitoring, stack tests, maintenance of equipment/pollution control devices, malfunctions, excess emissions, etc. (State/local regulations)	
		<b>26. NSPS Reporting/Recordkeeping.</b> Project is in compliance with the following requirements: <ul style="list-style-type: none"> <li>a. Documentation exists in project files demonstrating that project has complied with applicable notification requirements. (40 CFR 60.7)</li> <li>b. Records of startup/shutdown, malfunctions of NSPS process, control and monitoring equipment are in project files. (40 CFR 60.7)</li> <li>c. Source-specific recordkeeping requirements have been evaluated and project files contain all proper records. (40 CFR 60 Subparts)</li> <li>d. Reporting to regulatory agencies of source-specific requirements. (40 CFR 60 Subparts)</li> </ul>	

ATTACHMENT C  
TETRA TECH EC, INC.  
PESM INSPECTION CHECKLIST—AIR QUALITY

CONFIDENTIAL

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>
	<p><b>27. HAPs/NESHAPs Reporting/Recordkeeping.</b> Project is in compliance with the following requirements:</p> <ul style="list-style-type: none"> <li>a. Documentation exists in project files demonstrating that project has complied with applicable notification requirements (e.g., performance tests, visible emissions; startup/shutdown/malfunction reports; CMS performance; excess emissions and CMS performance report; summary report for each HAP) (40 CFR 63.7, .9, .10)</li> <li>b. Records of startup/shutdown, malfunctions, control and monitoring equipment are in project files. (40 CFR 63.6(e))</li> <li>c. Source-specific recordkeeping requirements have been evaluated and project files contain all proper records. (40 CFR 63, Subparts)</li> <li>d. Records of performance tests are maintained for 5 years.</li> <li>e. Startup/shutdown/malfunction plan has been developed &amp; is being properly implemented. Records are kept to demonstrate compliance with plan. If actions are taken that are inconsistent with plan, verbal reporting to agency was performed within 2 days &amp; written report was submitted within 7 days. (40 CFR 63.6(e)(3))</li> <li>f. Records required in 40 CFR 63.10 are being kept for 5 years.</li> </ul>	
<b>CFCs</b> (This section applies to projects which involve the handling of CFCs.)		
	<p><b>28. Export/Import/Production Destruction/Transformation of Ozone-Depleting Controlled Substances.</b> If project involves any of these activities, 40 CFR 82 must be consulted for specific reporting, recordkeeping, labeling, and training requirements.</p>	
	<p><b>29. Disposal of Appliances/Motor Vehicle Air Conditioners.</b> The disposal of appliances and MVACs are subject to specific disposal prohibitions specified in 40 CFR 82.154. The CFCs from these units must be evacuated by a certified recovery/recycling machine prior to disposal. (40 CFR 82.156) Persons performing testing and equipment used must be certified. (40 CFR 82.158(a) - (d))</p>	
	<p><b>30. Recordkeeping/Reporting.</b> If appliances/MVACs are disposed of, reporting and recordkeeping requirements are being met. (40 CFR 82.166)</p>	
<b>Miscellaneous</b> (Please complete each line in this section)		
	<p><b>31. Fugitive Dust.</b> Project generates fugitive dust and all reasonable measures (or other local standard) are being used to minimize fugitive emissions. At time of inspection fugitive dust was minimal and measures used to minimize dust were observed (e.g., water tank truck). (State/local regulations)</p>	


**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
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<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>
	<p><b>32. Odor.</b> Odors from project are minimized. (State/local regulations)</p>	
	<p><b>33. Complaints by Adjacent Landowners.</b> Complaints from adjacent landowners have been filed.</p>	
	<p><b>34. Inspections by Air Quality Regulatory Agencies.</b> Project has been inspected by air quality regulatory agency. <i>Please note the purpose (e.g., permit compliance), and results of the inspection.</i></p>	
	<p><b>35. Accidental Release Emergency Planning.</b> State emergency planning requirements are applicable to this project because toxic substances are stored on site that exceed threshold levels. These requirements may include registration, development of risk management plan (RMP), or incorporation of project-related activities into client's facility RMP. <i>Note: Federal § 112(r) program has not been finalized to date.</i> (State regulations).</p>	
	<p><b>36. Open Burning.</b> Project involves opening burning of construction - related debris/materials. Permit has been obtained from State/local air agency, if applicable. Burn - ban criteria have been evaluated and determined to <u>not</u> be applicable. State/local Fire Marshall has been contacted and approval, if required, has been granted. Project is being performed in compliance with any approvals/permits.</p>	

--End of Checklist--


**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— ASBESTOS**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
<b>Yes</b>	<b>No</b>	<b>N/A</b>
<b>REQUIREMENTS</b>		<b>COMMENTS/NOTES</b>

*This checklist applies to projects where asbestos materials or waste are present.*

<b>Surveying/Sampling Non-School Buildings</b>		
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>1. Licensing/Certification/Accreditation.</b> State/local regulations require that persons/company performing asbestos surveying/sampling in a facility be AHERA-accredited building inspectors if results will be used to determine negative presence of asbestos. (State/local air and safety regulations). Ensure copies of accreditation are present in project file.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>2. Handling/Disposal of Sampling Wastes/PPE.</b> Sampling wastes/PPE are being handled and disposed of in accordance with state/local requirements. (State/local air and safety regulations)	
<b>Demolition/Renovation</b> <i>(Applies if facility (or portion thereof) is being demolished or renovated. Demolition and renovation require an asbestos survey to be performed to ascertain presence, quantity, and location of asbestos containing materials.</i> <i>Note that some state or local regulatory agencies require prior notice for demolition even if no asbestos was identified in the survey (e.g., Puget Sound Clean Air Agency).</i>		
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>3. Written Notification.</b> Written notification has been provided to EPA/state regulatory agency with a delegated NESHAP asbestos program. Notice is maintained in on-site files. Notice provided based upon type of project. <i>Note: State/local (e.g., air agencies) regulations may establish different size/time periods for notification so be sure to check local requirements.</i> a. Demolition/renovation of at least 260 linear ft (160 ft <sup>2</sup> ) or 35 ft <sup>3</sup> of 1% Regulated Asbestos-Containing Material (RACM) -- 10 day notice provided. b. Demolition of less than 260 linear ft (160 ft <sup>2</sup> ) or 35 ft <sup>3</sup> of 1% RACM - 10 day notice provided. c. Renovation of less than 260 linear ft (160 ft <sup>2</sup> ) or 35 ft <sup>3</sup> of 1% RACM - no notice required. d. Revised notice provided if amounts of RACM changed by more than 20% or start date changes. (40 CFR 61.145(b)) e. Asbestos containing roof material, if more than 160 ft <sup>2</sup> is removed. (40 CFR 761, Appendix A provides EPA interpretive ruling)	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>4. Removal.</b> RACM was removed prior to demolition unless it is: a. Category I non-friable Asbestos-Containing Material (ACM) in good condition, b. On facility component which is encased in hard material/adequately wetted, c. Not accessible for testing; not discovered until work began, or d. Category II non-friable ACM unlikely to crumble during demolition. (40 CFR 61.145(c))	


**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— ASBESTOS**

**CONFIDENTIAL**

Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>5. Non-Component Removal/Emissions Controls.</b> RACM is adequately wetted unless:</p> <ul style="list-style-type: none"> <li>a. Agency has indicated that wetting would unavoidably damage equipment/pose safety hazard,</li> <li>b. Exhaust ventilation and collection system designed and operated to capture asbestos emissions is in use and no visible emissions to outside air,</li> <li>c. Glove bag system is being used which is operating to contain particulate asbestos, or</li> <li>d. Leak-tight wrapping is being used to contain all ACM. (40 CFR 61.145(c))</li> </ul>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>6. Component Removal/Emissions Controls.</b> RACM is stripped with appropriate wetting/exhaust venting or components are placed in leak-tight wrapping. Large components in which ACM is not disturbed and components are placed in leak-tight wrapping/labeled do not need to be stripped. (40 CFR 61.145(c)(4))</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>7. RACM Handling.</b> No visible emissions to outside air. RACM is carefully lowered to ground without damaging; use leak-tight chutes or containers if removal occurs 50 feet above ground. If temperature is below 0° C, no wetting is required. Temperature records kept for beginning, middle and end of each day and are recorded and retained for 2 years. (40 CFR 61.145(c))</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>8. Training.</b> Foreman trained in NESHAP regulations is present during shipping, removal, and handling. Verify that proof of training is at project site. OSHA requires annual refresher course. (40 CFR 61.145(c), 29 CFR 1926)</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>9. Posting Area.</b> Removal/storage area is demarcated and access is restricted. (29 CFR 1929 and 1915; state air regulations)</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>10. Health and Safety Requirements.</b> OSHA regulations specify requirements that include minimizing exposure, for establishing engineering controls and work practices, monitoring, PPE, medical surveillance, warning/posting/labeling, training/certification of asbestos workers and air monitors, recordkeeping.</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>11. Minimizing Emissions.</b> All areas of building where RACM is present are being cleaned using HEPA vacuuming, steam-cleaning of carpets/wet-cleaning of floors and horizontal surfaces. (GMP)</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>12. Vehicle Placarding.</b> All vehicles are marked with visible asbestos hazard warning signs. (40 CFR 61.150 and 61.149)</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>13. Disposal.</b> Disposal facility has been prequalified under TTEC procedures for disposal of ACM.</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>14. Labeling.</b> Containers/wrapped materials destined for disposal are labeled with generator name/location/asbestos label as specified in 29 CFR 1910.1001(j)(2) or 1926.58(k)(2)(iii). (40 CFR 61.150(d))</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>15. Shipping papers.</b> Shipment papers are prepared and signed by generator. (40 CFR 61.150(d))</p>	


**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— ASBESTOS**

**CONFIDENTIAL**

Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>16. Transportation.</b> Transporter has been pre-qualified under TTEC procedures for transportation subcontractors. Transportation on public roads of asbestos waste complies with 49 CFR 172.101 and 173, Subpart J. <i>Complete the "Oil and Hazardous Substances Management" checklist.</i>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>17. Reports.</b> Exception report has been submitted to EPA/delegated agency if shipment paper was not returned within 45 days. (40 CFR 61.150(d)) Note: May be managed by client. Ensure ESS is aware of who's responsibility it is to file exception reports.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>18. Recordkeeping.</b> Waste shipment records, exception reports and notifications are retained in project files.. (40 CFR 61.150(d), GMP)	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>19. Deconwater/Treatment Filters/PPE.</b> These waste streams may be regulated RACM. If so, they have been properly handled and disposed of. Review site documentation showing regulated status of these wastestreams.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>20. State Hazardous Waste.</b> RACM and wastes generated during remedial activity may be a state special/hazardous waste. Review EPP/WMP for any state-specific requirements relating to ACM.	
<b>School Building</b> ( <i>Applies if surveying, sampling, conducting written assessments, developing management plans, and conducting demolition renovation or operation and maintenance in public or non-public schools are performed.</i> )		
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>21. Training.</b> The following persons have been trained in accordance with State or Federal requirements. <ul style="list-style-type: none"> <li>a. Inspectors that conduct asbestos surveys. (40 CFR 763.85(a))</li> <li>b. Workers conducting response actions or maintenance activity.</li> <li>c. Contractor/Supervisors conducting response actions/maintenance activities.</li> <li>d. Persons who develop management plans per 40 CFR 763.93.</li> <li>e. Project Designer who designs activities associated with response actions/maintenance activities.</li> <li>f. Project Monitor who oversees abatement activities performed by contractor. (40 CFR 763, Appendix C)</li> </ul> Review site training matrix to determine if training requirements are being maintained for all site personnel.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>22. Surveys/Written Assessment.</b> Surveys should be repeated every 3 years to reassess condition of all friable known or assumed ACM. Review date of most recent survey for project activities related to ACM.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>23. Sampling.</b> During survey, material suspected of containing asbestos has been sampled in accordance with 40 CFR 763.86. Analysis is being performed by an accredited laboratory. At completion of response actions functional space must be sampled. (40 CFR 763.86, .87, and .90) Review project documentation to ensure samples were collected as determined necessary.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>24. Asbestos Management Plan.</b> Each facility with ACM has an asbestos management plan. (40 CFR 763.93)	


**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— ASBESTOS**

**CONFIDENTIAL**

Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>25. Response.</b> Response action is being conducted in accordance with written assessment developed under 40 CFR 763.88. The response action includes:</p> <ul style="list-style-type: none"> <li>a. Damaged/significantly damaged thermal system insulation (TSI) ACM which is being repaired or removed. All other TSI ACM and covering is being maintained intact and undamaged.</li> <li>b. Damaged friable surfacing ACM which is either being encapsulated, enclosed, removed or repaired.</li> <li>c. Significantly damaged friable ACM which is being isolated, access is restricted, and ACM is enclosed/encapsulated or removed. (40 CFR 763.90)</li> </ul>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>26. Operations and Maintenance Plan.</b> An O&amp;M Plan is being implemented if friable surfacing ACM, TSI ACM, and miscellaneous ACM that has potential for damage is found. If those materials have significant damage, O&amp;M plan is being implemented, area is isolated, access is restricted, preventative measures are being instituted, and ACM is being removed, encapsulated, restricted or repaired. (40 CFR 763.91)</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>27. Air Sampling.</b> Air sampling during and after completion of response action is being conducted in accordance with 40 CFR 763.90. Records of air sampling are being maintained in accordance with 40 CFR 763.94.</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>28. Notification.</b> Local education agency is providing annual written notification to parents, teachers and employee organization of availability of asbestos management plan. (40 CFR 763.93)</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>29. Minimizing Exposure.</b> All areas of building where friable ACM is present is cleaned using HEPA vacuuming, steam-cleaning of carpets/wet-cleaning of floors and horizontal surfaces. (40 CFR 763.91(c))</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>30. Record Keeping.</b> The following records, as applicable, are being maintained in the project files:</p> <ul style="list-style-type: none"> <li>a. Air sampling information.</li> <li>b. Cleaning records for activities described in 40 CFR 763.91(c).</li> <li>c. Other records, as required by client under contract, training records, description of response actions, surveillance activities, O&amp;M activities, etc.</li> </ul>	

-- End of Checklist --


**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— CONSERVATION RESOURCES AND ENVIRONMENTAL REVIEWS**

CONFIDENTIAL

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

**Location-Dependent Programs**

			<p><b>1. River.</b> If project site is located adjacent to or within a designed Wild and Scenic River, regulatory agency has been consulted regarding protective measures. Project is in compliance with those measures. Documentation is maintained. (Wild and Scenic Rivers Act, State regulations)</p>	
			<p><b>2. Coastal Zone Management Act.</b> If project site is located within a designated federal/state coastal zone, Coastal Zone Management Act Certification has been obtained and is maintained in files. (CZMA, State/local regulations)</p>	
			<p><b>3. Shoreline Protection.</b> If project site is located within protected shoreline area in the state, a Shoreline Protection Act permit has been obtained. Project is in compliance with permit terms and conditions. (State/local regulations)</p>	
			<p><b>4. Public Lands.</b> If project activities are located or are occurring within federal, state, local public lands, including parks, forests, reserves, and trails, access and use authorization were obtained &amp; documented. (Federal/State/local regulations)</p>	

**Environmental Review**

			<p><b>5. National Environmental Policy Act.</b> If applicable, project activities are in compliance with any mitigation measures specified in the final documentation (e.g., FONSI). (40 CFR 1500-1508)</p>	
			<p><b>6. State Environmental Policy Act.</b> Project files contain documentation demonstrating completion of the environmental review and site activities are in compliance with any mitigative measures specified in this document. (State regulation)</p>	
			<p><b>7. CERCLA/State Mini-CERCLA Cleanup.</b> Project is not required to undergo environmental review because it is being conducted under CERCLA or State cleanup law.</p>	
			<p><b>8. Exempt.</b> Project is categorically exempt or has obtained specific exemption that it is not required to undergo environmental review. Project files contain proper documentation. (40 CFR 1500, State regulations)</p>	


**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— CONSERVATION RESOURCES AND ENVIRONMENTAL REVIEWS**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

<b>Location or Activity-Dependent Programs</b>		
		<b>9. Archaeological/Cultural/Historic Resources.</b> Project activities involve excavation or other land disturbing activities. If State Historic Preservation Officer files show that no surveys have been conducted and client has no information about cultural resources at the site, Tetra Tech EC cultural resources specialist or client designated specialist conducted a survey prior to commencing land disturbing activities. (36 800, E.O. 11593)
		<b>10. Threatened/Endangered Species.</b> If applicable, project files contain notification and regulatory agency response. Project is in compliance with any mitigative measures. If "takings" occur, approval has been obtained. (50 CFR 17, 50 CFR 402.6, state/local regulations)
		<b>11. Fish and Wildlife Collection.</b> Permit/approval, if required, has been obtained and fish/wildlife collection regulations and guidance are being complied with. (33 CFR 230-330, State/local regulations)

--End of Checklist--


**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— DRINKING WATER, SOLE SOURCE AQUIFER, WELLHEAD PROTECTION AND WATER WITHDRAWAL**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes	No	N/A
<b>REQUIREMENTS</b>		<b>COMMENTS/NOTES</b>

*This checklist applies to projects in which drinking water sources are being constructed/modified/abandoned, groundwater is being withdrawn, or sole source aquifers or wellheads are being impacted.*

**Drinking Water Systems.** *(Applies if project involves connection to or upgrading a drinking water system.)*

			<b>1. Design.</b> System design has been approved by regulatory agency and is being constructed in accordance with design plans.	
			<b>2. PE Certification/Stamping.</b> If applicable, drawings are properly stamped/certified.	
			<b>3. Water System Permits.</b> If required, permit is maintained in files and activities are in compliance with permit terms/conditions.	
			<b>4. Water System Connection Approvals/Plumbing Code.</b> If applicable, the connection design has been approved by the local authority and conforms to the local plumbing code.	
			<b>5. Other Permits/Certifications.</b> Permits to conduct construction, demolition, and road alteration/interference have been obtained. If fill brought in, certification that fill is clean is maintained in files. <i>Complete the "Field/Construction/Road Activities" Checklist to demonstrate compliance.</i>	
			<b>6. Waste Management.</b> Construction debris and other wastes, if any, are being properly managed, transported, and disposed of. <i>Complete applicable waste checklists.</i>	
			<b>7. Easements/Right-of-Ways.</b> Activities are being conducted on property owned/controlled by third parties. Easements and right-of-ways have been obtained prior to conduct of activities and are contained in project files.	

**Well Construction and Abandonment.** *(Applies if construction or abandonment of water supply or monitoring wells are performed.)*

			<b>8. Well Construction and Abandonment Approval/Notice.</b> Notice or approval was obtained prior to commencing well construction or abandonment activities. Documentation is in project files. (State regulations)	
			<b>9. Well Decommissioning Forms.</b> Notice was submitted to agency after well was decommissioned. (State regulations)	
			<b>10. Well Construction Standards.</b> Well construction standards have been met. (State regulations)	
			<b>11. Well Contractor Licensing.</b> Contractor performing well construction/abandonment is properly licensed. Documentation of licensing is contained in project files. (State regulations)	


**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— DRINKING WATER, SOLE SOURCE AQUIFER, WELLHEAD PROTECTION AND WATER WITHDRAWAL**

CONFIDENTIAL

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

**Wellhead Protection.** *(Applies when project is located near water wells or "well fields" supplying public water.)*

			<b>12. Wellhead Protection Program.</b> States list wellhead areas that must be protected against contamination or degradation. The state list has been examined to determine if the project areas is listed. (State regulations)	
			<b>13. Wellhead Restrictions.</b> If the impacted area is within a wellhead protection area, all restrictions are being complied with. (State regulations)	

**Water Withdrawal.** *(Applies if groundwater is being withdrawn.)*

			<b>14. Groundwater Withdrawal Permit.</b> A withdrawal permit has been obtained if the volume of groundwater being withdrawn exceeds the state-determined level. Terms/conditions of permit are complied with. (State regulations)	
			<b>15. Sole Source Aquifer Protection Standards.</b> Groundwater withdrawal must comply with state/local aquifer protection standards if the underlying aquifer has been designated as a sole source aquifer. (State/local regulations)	

--End of Checklist--


**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST—EHS/EMS PROGRAMS**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

*This checklist applies to all projects*

<b>Program Administration and Documentation</b>		
		<b>1. EHS Procedures.</b> Site has access to current, relevant EHS Program requirements through CRL or other communication source.
		<b>2. Awareness Recognition Programs (EHS 1-2).</b> EHS awareness being implemented (e.g., postings, posters, etc.). EHS recognition program instituted.
		<b>3. Employee Participation Program (EHS 1-3).</b> "Major Projects" have EHS Committee, meetings held, and files contain required documentation. The EPP has been implemented and documented (EHS 1-3, Section 3.3).
		<b>4. Subcontractors (EHS 1-4).</b>
		a) <b>HIPO Field Contractors</b> have been approved and proper documentation is maintained.
		b) <b>Waste Management Subs</b> have been approved (including lower tier subcontractors) and proper documentation is maintained.
		<b>5. Visitor Safety (EHS 1-5).</b> Visitors entering site have complied with procedural requirements.
		<b>6. EHS Meetings (EHS 1-3)</b>
		a) EHS Daily Briefings conducted – contents properly documented, EMS issues discussed (ESQ Policy, worker impacts to environment, pollution prevention).
		b) "Major Projects" conduct weekly meetings. Documentation is maintained.
		<b>7. Incident/Regulatory Reporting (EHS 1-7)</b>
		a) Incident reports submitted for all incidents in a timely fashion.
		b) Investigation report submitted for all incidents in a timely fashion.
		c) Corrective actions identified in the investigation report have been completed and closure has been documented.
		d) Employer's first report of injury prepared and submitted on time.
		e) Permit exceedences/spills/releases have been reported to regulatory agencies as required by law or regulation.
		<b>8. Manifests/TtEC Permits (EHS 1-8).</b>
		a) Manifests are not signed by TtEC personnel except as allowed by EHS 1-8.
		b) No environmental permits in TtEC's name or TtEC as operator except as allowed by EHS 1-8.


**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST—EHS/EMS PROGRAMS**

**CONFIDENTIAL**

<b>Project:</b>			<b>Inspector:</b>			<b>Date:</b>			
		</							


**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST—EHS/EMS PROGRAMS**

**CONFIDENTIAL**

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	k) Discusses appropriate personnel and equipment decontamination procedures. Procedures are being implemented (EHS 5-1).	
	l) Includes Emergency Response Plan, which addresses potential site emergencies (EHS 2-1).	
	m) Addresses Bloodborne Pathogens (EHS 4-1), Hazard Communications (EHS 4-2), Radioactive/Mixed Waste (EHS 4-3), Hearing Conservation (EHS 4-4), and Temperature Extreme (EHS 4-6) requirements as applicable. Requirements are appropriate and properly implemented.	
	n) Addresses respiratory protection program (EHS 5-2) requirements. Program being implemented.	
	o) Addresses environmental conditions and regulatory requirements.	
	p) Identifies all waste streams, management requirements (including client requirements), and transport/disposal plans. These requirements are being implemented.	
	q) Identifies all required environmental permits – permits are current and all applicable conditions are implemented. <i>(Refer to specific checklists if necessary).</i>	
	<b>14. Inspections (EHS 3-3).</b>	
	a) Weekly/monthly inspections conducted. Closure of action items are documented.	
	b) Closures of previous PESM inspection action items are documented. <i>(Those action items not closed must be forwarded to action item matrix for this inspection).</i>	
	<b>Postings/ Signs/ Labeling/ Markings</b>	
	15. OSHA Job Safety & Health Poster.	
	16. OSHA 300 Log (February) posted.	
	17. OSHA Noise Regulation posted.	
	18. Department of Labor Postings.	
	19. Emergency phone numbers posted.	
	20. Other suggested postings: a) Evacuation routes posted. b) All hazard warning signs. c) Noise hazard warning signs. d) Control zones clearly identified. e) Site perimeter posted and controlled. f) Emergency exits clearly marked. g) Fire extinguishers clearly marked. h) Safety showers/ eyewashes clearly marked. i) Circuit breakers labeled. j) Low overhead hazards clearly marked.	
	21. Copy of TtEC Work Rules Posted (EHS 3-6).	




**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST—EHS/EMS PROGRAMS**

**CONFIDENTIAL**

		Project:	Inspector:	Date:
Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			44. Sufficient trained CPR/ first aid personnel available. (See EHS 1-11 for TtEC requirements).	
			45. Site personnel trained to perform ER tasks per EHS Plan.	
			46. ER drills conducted per EHS Plan.	
			47. Emergency response phone numbers verified.	
			48. Local fire department, hazardous materials group, hospital, etc. aware of TtEC expectations for emergency situations	
<b>Environmental Management System</b>				
			49. <b>Project-Specific Significant Environmental Risks (Aspects).</b> Project-specific significant environmental risks (aspects) have been identified in TIP.	
			50. <b>Significant EHS Risks</b> The Project/Site Manager should be able to describe project environmental and H&S risks and their mitigations.	
			a) <b>Pollution Prevention.</b> Does project have a recycling program for paper, bottle, cans, construction debris, trees/shrubs, other: _____ (specify). (Please circle all that apply). <i>If not, why not?</i>	
			51. <b>Document Control.</b> No obsolete company guidance documents are maintained on-site. See PO-8 for requirements. Project Staff utilize current company procedures/ have access to CRL.	
			52. <b>Operational Controls.</b> The operations/activities associated with project-specific significant environmental risks (aspects) are carried out in accordance with specifications included in the project work plan, other project plans, and/or applicable procedures. <i>Operational controls are described as mitigation measures in TIP.</i>	
			53. <b>Monitoring and Measuring and Corrective Measures.</b> Significant environmental risks (aspects) are being monitored and measured. Corrective action to address deficiencies is implemented and closure is documented in project files.	

-- End of Checklist--




**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— FIELD CONSTRUCTION AND ROAD IMPACTING ACTIVITIES**

**CONFIDENTIAL**

Project:		Inspector:	Date:
Yes	No	N/A	REQUIREMENTS
			COMMENTS/NOTES
			<p><b>7. Airport/FAA Approval.</b> Project involves the construction or placement of temporary or permanent buildings, equipment, or structures which will be constructed adjacent to an airport or exceed 200 feet in height. FAA Certification has been obtained for the project or a determination has been made that the project is exempt. Project files contain the FAA certification or exemption determination (14 CFR 77).</p>
			<p><b>8. Noise.</b> Project generates noise emissions (e.g., drilling rigs, construction equipment, etc.). Project is in compliance with state or local noise control standards. If restrictions have been placed on hours of operation, project operating logs demonstrate compliance with these restrictions. (State/Local regulations).</p>
			<p><b>9. Certification of Drawings.</b> As-builts, specifications, or drawings have been stamp/sealed by PE or certified by other professional, as applicable, in accordance with state/local regulation.</p>
			<p><b>10. Demolition Activities.</b> Project involves the demolition of structures or equipment.</p>
			<p>a. <b>Pre-demolition Notice/License.</b> Notice is maintained in project files or posted conspicuously, if required.</p>
			<p>b. <b>Hazardous substances.</b> A pre-demolition determination regarding the presence of hazardous substances (PCB, Mercury, Lead and Others) associated with building structures, processes and equipment has been made. Proper removal and segregation of these hazardous substances occurs before demolition.</p>
			<p>c. <b>Asbestos Determination.</b> A determination regarding the presence of asbestos has been made. Proper notifications have been made (40 CFR 61, State/Local agencies)</p>
			<p>d. <b>Waste Characterization.</b> Debris and other wastes have been characterized and are being properly managed and disposed of.</p>
<b>Miscellaneous</b>			
			<p><b>11. Excavation Activities.</b> Dig-safe/ "hot dig" permits/approvals have been obtained. Permits are maintained in the project files. (State/Local regulations)</p>
			<p><b>12. Well Drilling/Construction/Maintenance/Abandonment.</b> Project involves the drilling/abandonment of wells.</p>




**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— FIELD CONSTRUCTION AND ROAD IMPACTING ACTIVITIES**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes	No	N/A
<b>REQUIREMENTS</b>		<b>COMMENTS/NOTES</b>

			<b>17. Dust Control.</b> Project involves land disturbance activity that generates fugitive dust and all reasonable measures (or other local standard) are being used to minimize fugitive emissions. (State/Local regulations)	
			a. Planning. Project has plans, specifications and or procedures for the control of fugitive dust	
			b. Inspections. Project is observing and taking action when visual dust is observed. Responsibility for dust control and visual monitoring is assigned and understood.	
			c. Control Measures. Project has equipment and materials on site to effectively control fugitive dust from land disturbance activities. Controls are implemented in active and inactive (but not fully stabilized) construction areas.	
			d. Effectiveness. At time of inspection fugitive dust was observed to be minimal and controls used to minimize dust were observed (e.g., water tank truck).	
			<b>18. Stream Crossing.</b> If applicable, the USACE § 9 permit has been obtained. State may also require permit. <i>Complete "Wetlands/Streams/Floodplains" checklist.</i>	
			<b>19. Land Surveying.</b> Licensed/registered Professional Land Surveyor performed the surveying and stamped/sealed appropriate documentation. (State/local regulations)	
<b>Activities That Impact Roads/Traffic</b> ( <i>Applies if roads or traffic will be impacted by project activities.</i> )				
			<b>20. Road Alteration/Curb Cuts.</b> Opening/access permit or approval has been obtained from the local or state agency prior to commencing construction. (State/local regulations)	
			<b>21. Heavy/Large Loads.</b> Permit/approval has been obtained from state/local agency authorizing shipment. Time restrictions and weight limits for shipment are being complied with. (State/local transportation regulations)	
			<b>22. Traffic Impact Analysis.</b> If required, the analysis was conducted and approved by the local regulatory agency. (Local regulations)	
			<b>23. Road Crossing/Easements.</b> For public road crossings, right-of-way permit was obtained from state/local agency. For private road crossing, right-of-way permit or easement was obtained from private landowner. Permits/approvals are maintained in the project files. (State/local regulations)	



TETRA TECH EC, INC.  
**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

CONFIDENTIAL

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

*This checklist applies when client (or Tetra Tech EC, Inc., if applicable) is storing wastes for longer than 90 days, creating, treating, or disposing of hazardous wastes on-site. Project may include either conducting work at a client's already permitted facility or obtaining a permit. Therefore, reference to the term "facility" throughout this checklist may either include the entire project or the client's facility. However, if the client already has a RCRA permit, the inspection is limited only to those areas of the client's facility which are impacted by the project activities. Other checklists may be required for areas of concern not included under this permit (i.e., Wastewater Discharge, Hazardous Waste: Storage Treatment Disposal in less than 90 days, Air Quality, etc.)*

<b>General Requirements (Please complete each line in this section.)</b>		
	<b>1. ESS or Designated Waste Management Role. Discuss Role of ESS or designated individual with regards to waste management at the Site.</b> a. How is waste management handled. Is it working effectively? b. What types of problems have been encountered? c. Is ESS or designated individual receiving regulatory support/oversight from ESQ Specialists, as needed? d. Does ESS or designated individual have the required training and knowledge? Note – for permitted or interim status facility management, the designated individual should be trained and experienced to a much higher level than is typical on less than 90 day facilities at most Tt project sites.	
	<b>2. Permit Applications/Interim Status and Final Part B Permits.</b> Copies of Part A and B permit applications and final Part B permits are located on-site. Verify the following: (40 CFR 270) a. Permit is current. b. Existing physical facilities are consistent with contents in permit and application. c. Part A and B application and permit, as applicable, accurately reflect existing TSD project activities. d. Project is in compliance with applicable permit requirements. Note: Each part of the permit that affects TTEC scope of work must be reviewed and evaluated for compliance as part of this inspection	
	<b>3. EPA Identification Number.</b> Facility has an EPA Identification number to store/treat/dispose/transport/offer waste for transport. (40 CFR 264.11 and 265.11)	
	<b>4. Waste Determination.</b> Waste has been determined to be hazardous or state-regulated hazardous waste prior to treatment, storage or disposal. (40 CFR 264.13 and 265.13)	
	<b>5. Waste Analysis Plan.</b> Written waste analysis plan has been developed.	

TETRA TECH EC, INC.  
**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

CONFIDENTIAL

	Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	
	<p>a. Contents. The waste analysis plan includes:</p> <ul style="list-style-type: none"> <li>• All wastes generated and received at the project.</li> <li>• Parameters for which each waste will be analyzed.</li> <li>• Test methods used to test for these parameters.</li> <li>• Sampling method used to obtain representative samples.</li> <li>• Frequency with which initial analysis will be reviewed or repeated.</li> <li>• Provisions for retesting waste when the process or operation generating the waste changes.</li> <li>• Procedures used to inspect and analyze each hazardous waste shipment received. (40 CFR 264.13 and 265.13)</li> </ul>		
	<p>b. Recordkeeping. Records are kept that confirm waste received matches analyses, waste movement are kept within the facility, and analysis regarding restricted waste are maintained.</p> <p>c. Updates. WAP is updated to reflect requirements applicable to restricted wastes. (40 CFR 265.13(b)(6) and 268.7(c) and (d))</p>		
	<p><b>6. Waste Minimization.</b> Waste minimization practices are being implemented in accordance with a written plan. (40 CFR 262.41(a)(6)-(8); 58 Fed. Reg. 31114)</p>		
	<p><b>7. Inspection.</b> A written schedule has been developed and is being complied with to inspect monitoring equipment, safety equipment, security devices, and operating and structure equipment.</p> <p>a. A copy of the plan is kept at the project site.</p> <p>b. Areas subject to spills are inspected daily.</p> <p>c. Deterioration/malfunctions are remedied in a timely manner.</p> <p>d. All inspections are documented in a log.</p> <p>All inspections must show deficiencies, responsibility for correcting deficiencies, and dates on which those deficiencies were corrected.</p>		
	<p><b>8. Location Requirements.</b> Project involves the construction of a TSD unit. Location standards specified in 40 CFR 264.18 and 265.18 are being complied with.</p>		
	<p><b>9. Construction Quality Assurance Program.</b> For new surface impoundments, waste piles, or landfills (units, lateral expansions, and replacement units constructed after January 29, 1992), a construction quality assurance program was developed and implemented in accordance with 40 CFR 264.19 and 265.19.</p>		
<p><b>Closure/Post-Closure</b> (<i>Applies if the project involves closure or post-closure care for any hazardous waste management unit.</i>)</p>			
	<p><b>10. Closure Plan.</b> Closure is being conducted pursuant to an approved-closure plan. ESS should be able to describe closure requirements and how they are being met. (40 CFR 264.112 and 265.112)</p>		

TETRA TECH EC, INC.  
**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

CONFIDENTIAL

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<b>11. Amendment to Plan.</b> Written notice was provided to EPA/state requesting modification to the closure plan and Part B permit because changes in operating plans or facility design affect the closure plan, there is a change in the expected year of closure, or a partial or final closure is being conducted and unexpected events require modification to the approved plan. A copy of the notification should be included in the project files.	
	<b>12. Notification.</b> Notification was provided to EPA/state 60 days prior to conducting closure of a surface impoundment, waste pile, or landfill and at least 45 days prior to closure of a tank, container storage area or incinerator. A copy of the notification should be included in the project files. (40 CFR 264.112 and 265.112)	
	<b>13. Time Allocation.</b> Within 90 days of receiving the last volume of waste, all hazardous wastes are treated, removed from unit or dispose on-site in accordance with the closure plan. The partial/final closure of the unit must be completed within 180 days of receiving the last volume of waste unless an extension has been obtained from EPA/state. Documentation of compliance should be included in the project files. (40 CFR 264.113 and 265.113)	
	<b>14. Disposal.</b> All contaminated equipment, structures and soil are being properly disposed of or decontaminated unless standards specified for closure of individual units are complied with. Hazardous waste generator requirements, as applicable, are being complied with during closure. (40 CFR 264.114 and 265.114)	
	<b>15. Certification.</b> Within 60 days of completion of closure of surface impoundment, waste pile, land treatment, and landfill unit, or completion of final closure of a facility, certification was sent to EPA/state certifying that it was closed in accordance with approved plan. Certification was signed by independent PE and owner/operator of facility. Documentation of compliance should be included within project files. (40 CFR 264.115 and 265.115)	
	<b>16. Survey Plat.</b> Survey plat indicating location and dimensions of landfill cells or other hazardous waste disposal units prepared and certified by professional land surveyor was submitted in timely fashion to local zoning authority and EPA/state. (40 CFR 264.116 and 265.116)	
	<b>17. Post-Closure Care/Plans/Notices and Certifications.</b> Post-closure performance standards, plan requirements, amendment/permit modification requirements, notifications to regulatory agencies and certification of completion are being complied with. (40 CFR 264.117 - .120 and 265.117 - .120)	
	<b>18. State-Specific Requirements.</b> Closure meets state-specific requirements. (State Hazardous Waste Regulations) See Work Plan/WMP for details on requirements.	
<b>Container Storage</b> ( <i>Applies to storage of containers for greater than 90 days.</i> )		
	<b>19. Marking.</b> Containers are clearly marked with the words "Hazardous Waste".	

PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	
	<b>20. Condition.</b> Containers are in good condition (e.g., no severe rusting, apparent structural defects). (40 CFR 264.171 and 265.171)		
	<b>21. Compatibility.</b> Waste is compatible with container. (40 CFR 264.172 and 265.172)		
	<b>22. Management.</b> Containers are closed at all times, except when adding or removing wastes, and containers are handled/stored in a manner to prevent rupture/leaking. (40 CFR 264.173 and 265.173)		
	<b>23. Stacking Drums.</b> Containers stored on top of each other have pallets between them and are not stored more than 2 high. (GMP)		
	<b>24. Drum Log.</b> A log is kept of all drums contained in the storage area. (GMP)		
	<b>25. Location.</b> Containers holding ignitable/reactive waste are stored at least 50 feet from property boundary. (40 CFR 264.177 and 265.176)		
	<b>26. Secondary Containment--Final Status.</b> Storage area has a secondary containment system which: <ul style="list-style-type: none"> <li>a. Is impervious: free from cracks or gaps and impervious enough to contain leaks, spills, and precipitation.</li> <li>b. Base is sloped (or otherwise designed) to drain and remove liquids resulting from leaks, spills, or precipitation.</li> <li>c. Containers are elevated or protected from contact with accumulated liquids.</li> <li>d. Has adequate capacity to contain 10% of volume of containers or the volume of the largest container, whichever is greater.</li> <li>e. Run-on into the containment system is prevented or system has sufficient capacity to contain any runoff that might enter system.</li> <li>f. Liquids within containment system are removed as soon as practicable. (40 CFR 264.175)</li> </ul>		
	<b>27. Inspections.</b> Containers and storage area are inspected at least weekly and logs are kept of these inspections. (40 CFR 264.174 and 265.174)		
	<b>28. Incompatibility.</b> If incompatible wastes are stored in same container, they comply with precautions specified in 40 CFR 264.17(b) or 265.17(b) and if waste is placed in container that previously held incompatible waste, documentation exists that container was washed by drum recycler before reuse. (40 CFR 264.177 and 265.177)		
	<b>29. Separation.</b> Incompatible wastes/materials are separated from each other or protected from each other by dike, berm, wall or other device. (40 CFR 264.177 and 265.177)		
	<b>30. Closure.</b> Upon closure, storage area meets 40 CFR 264.111 or 265.111 decontamination/closure requirements. (40 CFR 264.179 and 265.179)		

TETRA TECH EC, INC.  
 PESH INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES

CONFIDENTIAL

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<p><b>31. Air Emissions.</b> Containers comply with management standards specified in 40 CFR Part 265.1030, -.1050, and -.1080.</p> <ul style="list-style-type: none"> <li>a. Subpart AA: Applies to process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air/steam stripping of hazardous wastes with organic concentrations of 10 ppm or greater. Operator must calculate emissions and operate equipment within those specified emissions.</li> <li>b. Subpart BB: Applies to equipment that contains or contacts hazardous waste with organic concentrations of 10 ppm or greater. Refer to subpart for standards for various equipment.</li> <li>c. Subpart CC: Applies to tanks, surface impoundments, and containers used to contain hazardous waste. (ie, hazardous waste is stored in DOT specification containers; hazardous waste tanks meet specific design criteria (note CERCLA and RCRA corrective action exemptions); emissions controls for surface impoundments)</li> </ul>	
	<p><b>32. State-Specific Requirements.</b> Storage area meets state-specific requirements. (State Hazardous Waste Regulations) See WMP for additional state requirements.</p>	
<b>Satellite Accumulation</b>		
	<p><b>33. Satellite Accumulation Area.</b> A SSA is being used to manage small quantities of hazardous waste being generated at or near the point of generation. If so, complete the applicable SAA section in the <i>Hazardous Waste: Storage Treatment Disposal in Less than 90 Days Checklist</i></p>	
<b>Tanks</b>		
	<p><b>34. Existing Tanks.</b> If wastes are being stored in existing tanks that do not have secondary containment, there is a written integrity assessment certified by an independent, registered PE that attests to the tank's integrity, within the project files.. (40 CFR 264.191(a) and 265.191(a))</p>	
	<p><b>35. New Tanks Installed as Part of Project.</b> Project involves the installation of a tank that stores/treats hazardous waste, and the following has been performed:</p> <ul style="list-style-type: none"> <li>a. <b>Integrity Assessment.</b> There is a written assessment reviewed/certified by independent, registered PE of tank's integrity on-site. (40 CFR 264.192(a) and 265.192(a))</li> <li>b. <b>Installation Inspection.</b> There is a written assessment by a qualified installation inspector or registered PE that tank is properly installed on-site. (40 CFR 264.192(b) - (g) and 265.192(b) - (g))</li> </ul>	
	<p><b>36. Marking.</b> Tanks are clearly marked with "Hazardous Waste".</p>	

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	
	<p><b>37. Containment System.</b> Applies to a new tank, existing tank storing F020-F023, F026/F027, or other specified existing tanks, unless variance obtained.</p> <p>a. <b>General Requirement.</b> Containment system is capable of detecting/collecting releases and accumulated liquids until collected material is removed. (40 CFR 264.193(b)(3) and 265.193(b)(2))</p> <p>b. <b>Leak Detection.</b> Containment system has leak detection system that is designed/operated to detect failure of either primary or secondary containment structure or any release of waste in system within 24 hours, or earliest practicable time. (40 CFR 264.193(c) and 265.193(c))</p> <p>c. <b>Removal of Releases.</b> All spills, leaks, precipitation are removed from containment system within 24 hours. (40 CFR 264.193(c) and 265.193(c))</p> <p>d. <b>Specific Design.</b> Containment is: a liner, vault, double-walled tank or other EPA/state-approved device that meets specified design requirements (e.g., suitable base, sloped, leak detection system). (40 CFR 264.193(d) and (e) and 265.193(d) and (e))</p> <p>e. <b>Ancillary Equipment.</b> Ancillary equipment is provided with secondary containment. (40 CFR 264.193(f) and 265.193(f))                      Note: Not applicable to above ground piping/welded flanges, joints, and connections/seamless or magnetic coupling pumps and valves/pressurized aboveground piping with automatic shut-off devices that are visually inspected daily.</p> <p>f. <b>Existing tanks not yet subject to containment requirement.</b> If existing tank is being utilized which is not yet subject to containment requirement there is written assessment to leak test tank or tank integrity performed annually by registered PE kept on-site. (40 CFR 264.193(i) and 265.193(i))</p>		
	<p><b>38. Overfill/Spill Control.</b> Tank system includes spill prevention controls; overfill prevention controls and maintenance of freeboard in uncovered tanks to prevent overtopping. (40 CFR 264.194 and 265.194)</p>		
	<p><b>39. Inspection.</b> Daily inspections are performed of overfill/spill control; aboveground points of tank; monitoring/leak detection; and tank integrity for signs of ruptures, leaks, corrosion, and surrounding area. Cathode protection systems are inspected bimonthly (and 6 months after installation). Records are kept of inspections. (40 CFR 264.195 and 265.195)</p>		

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	<p><b>40. Spills/Releases.</b> If a spill has occurred from tank/containment system, the following must be performed: (40 CFR 264.196 and 265.196)</p> <ul style="list-style-type: none"> <li>a. <b>Waste/Released Material.</b> Waste is removed from tank as necessary to prevent further release and released material is removed from containment area within 24-hours/in timely manner. (40 CFR 264.195(a) and (b) and 265.195(a) and (b))</li> <li>b. <b>Release to Environment.</b> A visual inspection/removal of contamination was conducted and Environmental Compliance Spill/Release procedure was implemented. (40 CFR 264.196(c) and 265.196(c))</li> <li>c. <b>Notification.</b> If release to environment occurred, proper verbal and written notification was conducted. (40 CFR 264.196(d) and 265.196(d))</li> <li>d. <b>Repair.</b> If after the release the tank system required major repair, PE certification was sent to EPA/state. (40 CFR 264.198(e) and 265.198(e)) <i>Note: Major repair includes installation of internal liner, repair of ruptured containment system, etc.</i></li> </ul>		
	<p><b>41. Closure.</b> At closure, the standards in 40 CFR 264.197 or 265.197 and Subpart G were met which include removing/decontaminating waste residue, contaminated containment system, contaminated soils, structures, and equipment. (40 CFR 264.197 and 265.197)</p>		
	<p><b>42. Ignitable/Reactive.</b> If ignitable/reactive waste are stored in tank, 1) waste is treated, rendered, or mixed before placement so that it is no longer ignitable/reactive and meets 40 CFR 265.17(b) <b>OR</b> 2) waste is stored/treated so that it is protected from material/conditions that may cause ignition/reaction <b>OR</b> 3) tank system is used solely for emergencies <b>AND</b> NFPA requirements for storage of such wastes are met. (40 CFR 264.198 and 265.198)</p>		
	<p><b>43. Incompatible Wastes.</b> Incompatible wastes/materials are not placed in same tank system. (40 CFR 264.199 and 265.199)</p>		
	<p><b>44. Air Emissions.</b> Storage tanks comply with management standards specified in 40 CFR Part 264 or 265, Subpart AA (air emissions for process vents), BB (emissions standards for equipment leaks), and CC (air emissions for surface impoundments, tanks, and containers, if applicable). (40 CFR 264.178 and 265.178)</p>		

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	
	<p><b>45. Waste Analysis and Treatment -- Interim Status.</b> Tank system is used: 1) to treat chemically or to store a hazardous waste that is substantially different from waste previously treated or stored in the tank; or 2) treat chemically a hazardous waste with a substantially different process than any previously used in that tank system. The following is being performed:</p> <ul style="list-style-type: none"> <li>a. Waste analyses and trial treatment or storage tests (e.g., bench-scale or pilot-plant scale tests); OR</li> <li>b. Written, documented information was obtained on similar waste under similar operating conditions to show that the proposed treatment or storage will meet the requirements of § 265.194(a). (40 CFR 265.200)</li> </ul>		
	<p><b>46. State-Specific Requirements.</b> Tank system meets state-specific requirements (State Hazardous Waste Regulations). See WMP for requirements.</p>		
<b>Containment Buildings</b>			
	<p><b>47. Enclosed.</b> Building is completely enclosed (floor/walls and roof) and self-supported, and can support the waste and daily operating activities. (40 CFR 264.1100(a) and 265.1100(a))</p>		
	<p><b>48. Barrier.</b> Building has a primary barrier that is designed to be sufficiently durable to withstand the movement of personnel and equipment. Barrier is free of significant cracks, gaps, corrosion or other deterioration that could cause release of waste. (40 CFR 264.1101(a)(4) and (c) and 265.1101(a)(4) and (c))</p>		
	<p><b>49. Compatibility.</b> Surfaces are chemically compatible with wastes that come into contact with them. (40 CFR 264.1101(a)(2) and 265.1101(a)(2))</p>		
	<p><b>50. Amount of Waste.</b> Level of waste within containment walls does not exceed height of wall. (40 CFR 264.1101(c) and 265.1101(c))</p>		
	<p><b>51. Decontamination.</b> Building has decontamination area and procedures to prevent tracking waste out of building. (40 CFR 264.1101(c) and 265.1101(c))</p>		
	<p><b>52. Fugitive Dust Control.</b> Fugitive dust is controlled so that openings (doors, windows, vents, cracks, etc.) exhibit no visible emissions during normal operating conditions including when vehicles enter and exit unit. If particulate collection devices are used (fabric filter, electrostatic precipitator) these devices are operated and maintained. (40 CFR 264.1101(c) and 265.1101(c))</p>		

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<p><b>53. Liquids Management.</b> If containment building is used to store/treat wastes with free liquids, the following requirements are met: (40 CFR 264.1101(b) and 265.1101(b))</p> <ul style="list-style-type: none"> <li>a. <b>Primary Barrier</b> is designed to prevent the migration of hazardous constituents into the barrier.</li> <li>b. <b>Liquid Collection/Removal.</b> Liquid collection system minimizes accumulation of liquids on primary barrier— Primary barrier is sloped to drain liquids to collection system and liquids/waste are collected/removed to minimize hydraulic head on containment system at earliest practicable time.</li> <li>c. <b>Secondary Containment.</b> The secondary containment system includes a secondary barrier designed and constructed to prevent migration of hazardous constituents into barrier and leak detection system capable of detecting failure of primary barrier and collecting accumulated wastes/liquids. <i>(Note: Leak detection system requirement is met if bottom slope is 1% or more and constructed of granular drainage material with hydraulic conductivity of <math>1 \times 10^{-2}</math> or more and 12 inches thick or constructed of synthetic/geonet drainage materials with transmissivity of <math>3 \times 10^{-5} \text{ m}^2/\text{sec}</math> or more)</i></li> <li>d. <b>Treatment.</b> If treating in building, treatment area must be designed to prevent release of liquids, wet materials, or liquid aerosols to other portions of building.</li> <li>e. <b>Chemically Resistant.</b> Secondary containment system is constructed of materials that are chemically resistant to waste and liquids managed and of sufficient strength and thickness.</li> </ul>	
	<p><b>54. PE Certification.</b> On-site files contain PE certification that containment building is designed in accordance with 40 CFR 264 or 265.1101(a) through (c). (40 CFR 264.1101(c)(2) and 265.1101(c)(2)).</p>	
	<p><b>55. Release.</b> If condition detected that could cause or has caused a release of waste, the following has been conducted: (40 CFR 264.1101(c)(3) and 265.1101(c)(3))</p> <ul style="list-style-type: none"> <li>a. <b>Repair.</b> Condition was promptly repaired and any cleanup was conducted.</li> <li>b. <b>Recordkeeping.</b> Condition/release was recorded in operating record.</li> <li>c. <b>Notification.</b> Within 7 days EPA was notified and within 14 working days written plan of steps taken to repair/cleanup was submitted.</li> <li>d. <b>PE Certification.</b> After repairs were performed, EPA was provided with PE certification that repairs/cleanup were conducted in accordance with written plan.</li> </ul>	

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<b>56. Inspection.</b> Building is inspected once every 7 days and results are recorded in project log book/inspection log. (Inspection should include monitoring/leak detection equipment data, containment building, surrounding area for signs of release/deterioration) (40 CFR 264.1101(c)(4) and 265.1101(c)(4))	
	<b>57. Areas With and Without Secondary Containment.</b> If building contains areas with and without secondary containment, each area is designed and operated to meet specified requirements, measures are taken to prevent release of liquids/wet materials into areas without secondary containment, and operating log provides written description of procedures used to maintain integrity of areas without secondary containment. (40 CFR 264.1101(d) and 265.1101(d)).	
	<b>58. Closure.</b> Upon leaving the project site, contaminated containment systems, contaminated sub-soils, and structures/equipment contaminated with waste or leachate are removed or decontaminated. Requirements for closure specified in Subpart G and H are being met. Post-closure care requirements are being met if contaminated sub-soils could not be practically removed or decontaminated. (40 CFR 264.1102 or 265.1102)	
	<b>59. Recordkeeping.</b> The following records are kept: a. Certification by PE that building meets design requirements. b. Operating log which includes containment building operations and reported leaks or spills. c. Regulatory agency correspondence. d. Operating procedures to maintain integrity of areas without secondary containment. (40 CFR 264.1101 and 265.1101)	
	<b>60. State-Specific Requirements.</b> Containment building meets state-specific requirements. (State Hazardous Waste Regulations) See WMP for requirements.	
<b>Surface Impoundments</b>		
	<b>61. Permit.</b> Surface impoundment is operating in accordance with conditions of permit. (40 CFR 270)	
	<b>62. Construction or Expansion.</b> Project involves the construction or replacement of portions of a surface impoundment. The unit is designed and constructed with two or more liners and a leachate collection and removal system between such liners OR an EPA/state-approved alternative design. (40 CFR 264.221(c) and 265.221(a) - e)) <i>Note: This requirement applies to construction, lateral expansions or replacement of existing units which commenced after January 29, 1992 For interim status units, additional exemptions/variances may apply for replacement units.</i>	

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	
	<p><b>63. Existing Units.</b> Project involves non-construction activities at an existing surface impoundment. The unit :</p> <ul style="list-style-type: none"> <li>a. Contains a liner which is designed, constructed and installed to prevent the migration of waste out of the unit. <i>Applies to final status.</i> (40 CFR 264.221(a))</li> <li>b. Has 2 feet of freeboard to prevent overtopping of the dike by overfilling, wave action or a storm, unless alternative design is certified by qualified engineer. <i>Applies to interim status.</i> (40 CFR 265.221(f) and (g))</li> <li>c. Designed, constructed, maintained and operated to prevent overtopping by overfilling due to normal or abnormal activities, wind and wave action, rainfall, runoff, malfunctions of level controllers, alarms and other equipment and human error. <i>Applies to final status.</i> (40 CFR 264.221(g))</li> <li>d. Has a containment system (e.g., earthen dike, covered with grass, rock, or shale) that shows no signs of erosion. (40 CFR 264.221(h) and 265.223)</li> <li>e. Has additional design requirements as specified in the Part B permit. <i>Applies to final status.</i> (40 CFR 264.221(i))</li> </ul>		
	<p><b>64. Inspections.</b> The following inspections are conducted. Records are maintained at the project site.</p> <ul style="list-style-type: none"> <li>a. During and after installation and construction, liners and cover systems are inspected. <i>Applies to final status only.</i></li> <li>b. Freeboard level is checked daily for interim status facilities and weekly for final status facilities.</li> <li>c. Weekly and after storm events, evidence of deterioration, malfunctions, or improper operation of overtopping control systems, sudden drops in the level of the impoundment contents, and severe erosion or other signs of deterioration of dikes and containment devices are checked.</li> <li>d. Leak detection systems are monitored and amount of liquid removed from sump is recorded at least monthly. (40 CFR 264.226 and 265.226)</li> </ul>		
	<p><b>65. Response Action.</b> For new or expansion units, an approved response plan has been developed which describes the actions to be taken if action leakage rate has been exceeded. If flow rate into the leak detection system exceeded the action leakage rate for any sump, EPA was notified in writing within 7 days; a preliminary written assessment was sent to EPA within 14 days; results of determination regarding the location/size/cause of leak, determination whether waste should continue to be received, and long- and short-term actions was submitted to EPA within 30 days after notification. (40 CFR 264.223 and 265.223)</p>		
	<p><b>66. Certification -- Final Status.</b> Prior to issuance of permit and after extended period, certification was obtained from qualified engineer regarding the integrity of the dike system. (40 CFR 264.226(c))</p>		

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	
	<b>67. Removal from Service -- Final Status.</b> If level of liquids in impoundment suddenly dropped and cause was not due to flow into or out of impoundment, or the dike leaked, the unit was removed from service in accordance with 40 CFR 264.227(b). Notification to EPA within 7 days was conducted and prior to reinitiating service the steps specified in 40 CFR 264.227(d) were complied with. (40 CFR 264. 227)		
	<b>68. Closure/Post-Closure.</b> Project activities involve closure of a surface impoundment. At closure, all waste residues, contaminated containment system components, contaminated sub-soils, and structures/equipment contaminated with waste and leachate are being removed or decontaminated OR free liquids are being eliminated by removing or solidifying the remaining wastes and residues and covering the surface impoundment. Post-closure care will be conducted if waste residues or contaminated materials are left in place at final closure. Closure plan, cost estimate and financial responsibility requirements specified in Subpart G are also being complied with. (40 CFR 264.228 and 265.228)		
	<b>69. Ignitable/Reactive Wastes.</b> Ignitable/reactive wastes are not placed in the surface impoundment unless: a. Waste and impoundment satisfy 40 CFR 268 requirements; AND b. Waste is treated, rendered or mixed before or immediately after placement in the impoundment so that mixture or dissolution of material no longer meets definition of ignitable or reactive and 40 CFR 264.17(b) or 265.17(b) are complied with; OR c. Waste is managed in such a way that it is protected from any material or conditions which may cause it to ignite or react; OR d. Surface impoundment is used solely for emergencies. (40 CFR 264.229 and 265.229)		
	<b>70. Incompatible Wastes.</b> Incompatible wastes/materials are not placed in the same surface impoundment unless 40 CFR 264.17(b) or 265.17(b) requirements are met. (40 CFR 264.230 and 265.230)		
	<b>71. Dioxin-containing Wastes -- Final Status.</b> Waste codes F020-F023, F026, and F027 are not placed in a surface impoundment unless the impoundment is operated in accordance with a management plan approved by EPA/state. (40 CFR 264.231)		
	<b>72. Waste Analysis and Trial Tests -- Interim Status.</b> If surface impoundment is being used to chemically treat a hazardous waste which is substantially different from waste previously treated OR chemically treat hazardous waste with a substantially different process than previously used, EITHER waste analyses and trial treatment tests were conducted prior to treatment OR written documented information on similar treatment of similar waste under similar operating conditions to demonstrate compliance with 40 CFR 265.17(b) has been obtained. (40 CFR 265.225)		

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	<b>73. Air Emissions Standards.</b> Air emission standards specified in Subpart CC are being complied with if the surface impoundment is used to manage volatile organic compounds. This requirement applies after June 1996. (40 CFR 264.232 and 265.231)		
	<b>74. State-Specific Requirements.</b> Surface impoundment meets state-specific requirements. (State Hazardous Waste Regulations)		
<b>Waste Piles</b>			
	<b>75. Permit.</b> Waste pile is operating in accordance with conditions of permit. (40 CFR 270)		
	<b>76. Protection From Wind.</b> Pile containing hazardous waste is protected from the wind. Are appropriate BMPs in place? (40 CFR 264.251(j) and 265.251)		
	<b>77. Waste Analysis.</b> Incoming shipments of waste are analyzed prior to adding to the pile to determine compatibility of the waste, unless waste being added is known to be compatible. (40 CFR 264.257 and 265.252)		
	<b>78. Construction or Expansion.</b> Project involves the construction or replacement of portions of a waste pile. Waste pile has: <ul style="list-style-type: none"> <li>a. Double liner that meets the requirements of 40 CFR 264.251(c);</li> <li>b. Leachate collection and removal system;</li> <li>c. Run-on control system capable of preventing flow onto active portion of pile from at least 25-year storm;</li> <li>d. Run-off system to collect/control water volume from 24-hour, 25-year storm;</li> <li>e. Collection/holding systems must be emptied or otherwise managed expeditiously after storms to maintain design capacity;</li> <li>f. Additional requirements specified in permit. (40 CFR 264.251 and 265.254)</li> </ul> <i>Note: This requirement applies to construction, lateral expansions or replacement of existing units which commenced after January 29, 1992.</i>		

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<p><b>79. Existing Waste Pile.</b> Unless an alternative design has been approved by EPA/state, waste pile has:</p> <ul style="list-style-type: none"> <li>a. Liner designed, constructed, and installed to prevent migration of wastes out of the pile. <i>Applies to final status.</i> (40 CFR 264.251(a))</li> <li>b. Impermeable base compatible with the waste which supports liner. (40 CFR 264.251 and 265.253(a)(1))</li> <li>c. Run-on diversion and control systems. (40 CFR 264.251(g) and 265.253(a))</li> <li>d. Leachate and runoff collection. (40 CFR 264.251 and 265.253) and</li> <li>e. Collection/holding systems must be emptied or otherwise managed expeditiously after storms to maintain design capacity.</li> </ul> <p><i>Note: Existing pile must be constructed prior to January 29, 1992. If pile is at interim status facility and it is protected from precipitation and runoff by other means, and no liquids or waste containing free liquids are placed on pile, then these conditions do not apply.</i></p>	
	<p><b>80. Exemptions -- Final Status.</b> Waste pile is located indoors or otherwise protected from factors which produce leachate and runoff. Pile does not need to comply with the lining, leachate collection and groundwater protection requirements. Verify:</p> <ul style="list-style-type: none"> <li>a. Liquids are not placed in the waste pile (40 CFR 264.250(c)(1));</li> <li>b. The unit is protected from surface water runoff (40 CFR 264.250(c)(2));</li> <li>c. Wind dispersal is controlled by a means other than wetting; (40 CFR 264.250(c)(3)); and</li> <li>d. Pile does not generate leachate through decomposition or reactions (40 CFR 264.250(c)(4)).</li> </ul>	
	<p><b>81. Inspections.</b> The following inspections are conducted. Records are maintained at the project site.</p> <ul style="list-style-type: none"> <li>a. During and after installation and construction, liners and cover systems are inspected. <i>Applies to final status only.</i></li> <li>b. Weekly and after storm events, evidence of deterioration, malfunctions, or improper operation of run-on/run-off systems, proper functioning of wind dispersal control systems and presence of leachate in and proper functioning of leachate collection and removal systems are inspected. <i>Applies to final status only.</i></li> <li>c. Leak detection systems are monitored and amount of liquid removed from sump is recorded at least weekly. (40 CFR 264.254 and 265.260)</li> </ul>	

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	<p><b>82. Response Action.</b> For new or expansion units, an approved response plan has been developed which describes the actions to be taken if action leakage rate has been exceeded. If flow rate into the leak detection system exceeded the action leakage rate for any sump, EPA was notified in writing within 7 days; a preliminary written assessment was sent to EPA within 14 days; results of determination regarding the location/size/cause of leak, determination whether waste should continue to be received, and long- and short-term actions was submitted to EPA within 30 days after notification. (40 CFR 264.253 and 265.259)</p>		
	<p><b>83. Closure/Post-Closure.</b> Project activities involve closure of a waste pile. At closure, all waste residues, contaminated containment system components, contaminated subsoils, and structures/equipment contaminated with waste and leachate are being removed or decontaminated. If after removal/decontamination all contaminated subsoils can not be practicably removed/decontaminated, post-closure care will be conducted. Closure plan, cost estimate and financial responsibility requirements specified in Subpart G are also being complied with. (40 CFR 264.258 and 265.258)</p>		
	<p><b>84. Ignitable/Reactive Wastes.</b> Ignitable/reactive wastes are not placed in a waste pile unless:</p> <ul style="list-style-type: none"> <li>a. Waste and impoundment satisfy 40 CFR 268 requirements; AND</li> <li>b. Waste is treated, rendered or mixed before or immediately after placement in the impoundment so that mixture or dissolution of material no longer meets definition of ignitable or reactive and 40 CFR 264.17(b) or 265.17(b) are complied with; OR</li> <li>c. Waste is managed in such a way that it is protected from any material or conditions which may cause it to ignite or react. (40 CFR 264.256 and 265.256)</li> </ul>		
	<p><b>85. Incompatible Wastes.</b> Incompatible wastes/materials are not placed in the same waste pile unless 40 CFR 264.17(b) or 265.17(b) requirements are met.</p> <ul style="list-style-type: none"> <li>a. Pile that is incompatible with waste/materials stored nearby in containers, other piles, open tanks, or surface impoundments is separated from other materials or protected from them by dike, berm, wall or other device.</li> <li>b. Waste is not piled on same base where incompatible waste/materials were previously piled unless base was decontaminated sufficiently to meet 40 CFR 264.17(b) or 265.17(b) requirements. (40 CFR 264.257 and 265.257)</li> </ul>		
	<p><b>86. Dioxin-Containing Wastes -- Final Status.</b> Waste codes F020-F023, F026, and F027 are not placed in a waste pile unless it is operated in accordance with a management plan approved by EPA/state. Additional design requirements, if any, are being complied with. (40 CFR 264.259)</p>		
	<p><b>87. State-Specific Requirements.</b> Waste pile complies with state-specific requirements. (State Hazardous Waste Regulations)</p>		

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Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

**Drip Pads**

	<p><b>88. Design and Operation.</b> Drip pads are designed and operated as follows:</p> <ul style="list-style-type: none"> <li>a. Constructed solely of nonearthen materials (40 CFR 264.573(a)(1) and 265.443(a)(1);</li> <li>b. Has an intact curb or berm around the perimeter of the pad and pad is sloped to drain liquids into a collection system (40 CFR 264.573(a)(2) and (3) and 265.443(a)(2) and (3);</li> <li>c. Pad is either covered or capable of preventing runoff and runoff from a 24-hour, 25-year storm (40 CFR 264.573(e) and (f) and 265.443(e) and (f)).</li> <li>d. Collecting/holding units are emptied as soon as possible after storms. (40 CFR 264.573(h) and CFR 265.443(h));</li> <li>e. Pad has hydraulic conductivity of <math>1 \times 10^{-7}</math> cm/sec or less and is free of cracks and gaps, OR synthetic liner is below drip pad, leak detection system is above liner, and leak collection system is installed immediately above the liner. (40 CFR 264.573(a)(4), (b)(1) and (2) and 265.443(a)(4), (b)(1) and (2))</li> <li>f. Pad is operated/maintained to minimize tracking of waste/constituents off pad resulting from personnel or equipment activities. (40 CFR 264.573(k) and 265.443(j))</li> <li>g. After removal from treatment vessel, treated wood is held on pad until drippage has ceased; records are maintained to document. (40 CFR 264.573(k) and 265.443(k))</li> </ul>	
	<p><b>89. Construction of New Units.</b> Project activities involve the construction of a new drip pad. All of the requirements specified in #1 are complied with EXCEPT:</p> <ul style="list-style-type: none"> <li>a. Pad has hydraulic conductivity of <math>1 \times 10^{-7}</math> cm/sec or less and is free of cracks and gaps, OR synthetic liner is below drip pad, leak detection system is above liner, and leak collection system is installed immediately above the liner. (40 CFR 264.573(a)(4), (b)(1) and (2) and 265.443(a)(4), (b)(1) and (2)) OR</li> <li>b. Pad has a synthetic liner and leakage detection system constructed in accordance with 40 CFR 264.573(b) or 265.442(b).</li> </ul> <p><i>Note: New units are those which commenced construction after December 24, 1992.</i></p>	
	<p><b>90. Assessment and Certification.</b> Written independent professional engineering assessments and annual certifications have been conducted and are located in the on-site project files. (40 CFR 264.573(a)(4) and (g), 264.574(a) and 265.441, 265.443(a)(4) and (g))</p>	
	<p><b>91. Operating Record.</b> Past operating and waste handling practices are document in the facility records. (40 CFR 264.573(o) and 265.443(n).</p>	

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	<p><b>92. Closure.</b> Based upon review of closure plan determine if all wastes will be removed and all contaminated equipment, sub-soils, and structures will be removed or decontaminated OR if the unit will be closed as a landfill. (40 CFR 264.575 and 265.445).</p>	
	<p><b>93. Inspection.</b> The following inspections have or are being conducted. Documentation is placed in on-site files.</p> <ul style="list-style-type: none"> <li>a. Liners and cover systems were inspected during and after installation (examine construction records to determine). (40 CFR 264.574(a) and 265.441(a))</li> <li>b. Drip pads are inspected weekly while in operation and after storm events to detect deterioration, malfunction, or leakage of run-on and runoff control systems, leak detection systems, and the drip pad surface. (40 CFR 264.574(b) and 265.444(b)).</li> <li>c. Drip pads are sufficiently clean to allow weekly inspections. Facility records must note the date and time of cleaning. (40 CFR 264.573(i) and 265.444(i))</li> </ul>	
	<p><b>94. Release.</b> If leak detected, the following has been conducted: (40 CFR 264.573(m) and 265.443(m))</p> <ul style="list-style-type: none"> <li>a. <b>Repair.</b> Condition was promptly repaired and any cleanup was conducted.</li> <li>b. <b>Recordkeeping.</b> Condition/release was recorded in operating record.</li> <li>c. <b>Notification.</b> Within 24 hours EPA was notified and within 10 days a written report of steps taken to repair/cleanup was submitted.</li> <li>d. <b>Certification.</b> Independent engineering certification was submitted upon completion of repairs and cleanup.</li> </ul>	
	<p><b>95. State-Specific Requirements.</b> Drip pads comply with state-specific requirements. (State Hazardous Waste Regulations)</p>	
<b>Landfills</b>		
	<p><b>96. Design and Operation.</b> Project involves construction of a new landfill, replacement landfill or lateral expansion of existing landfill that first received waste after November 8, 1984, that meets specific design and construction standards. Landfill constructed after January 29, 1992, that meets minimum technology requirements for</p> <ul style="list-style-type: none"> <li>a. Double liners;</li> <li>b. Leak detection; and</li> <li>c. Groundwater monitoring. (40 CFR 264.301, 264.90 - 100 and 265.301)</li> </ul>	
	<p><b>97. Written Procedures.</b> Procedures are in place to ensure that received waste is appropriate for landfilling and waste is placed in the proper landfill cell. (40 CFR 270.21)</p>	

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	<p><b>98. Runoff Collection/Control System.</b> Landfill has a runoff diversion and control system which is capable of managing a 24-hour, 25-year storm.</p> <ul style="list-style-type: none"> <li>a. The system is emptied as soon as practicable to maintain the required holding capacity.</li> <li>b. Collected runoff is analyzed to determine if it is hazardous waste.</li> <li>c. Collected runoff is properly managed according to characterization. (40 CFR 264.301(g), (h), and (j) and 265.301(b) - (c)).</li> </ul>	
	<p><b>99. Waste Location Documentation.</b> Operating record contains information on a map designating the exact location and dimensions (including depth of each cell with respect to permanent surveyed bench marks and the contents of each cell) and approximate locations of each hazardous waste type within each cell. (40 CFR 264.73(b)(1) and (2), 264.309 and 265.73(b)(1) and (2) and 265.309)</p>	
	<p><b>100. Inspection.</b> The following inspections have or are being conducted. Documentation is contained in project files.</p> <ul style="list-style-type: none"> <li>a. Liners and cover systems were inspected during and after installation (examine construction records to determine).</li> <li>b. Landfill is inspected weekly while in operation and after storm events to detect deterioration, malfunctions, or improper operation of run-on and run-off control systems; proper functioning of wind dispersal control systems, and presence of leachate in and proper functioning of leachate collection and removal systems.</li> <li>c. If landfill is required to have a leak detection system under 40 CFR 264.301(c) or (d) record of the amount of liquids removed from each leak detection system sump must be kept at least once each week during the active life and closure period. After final cover is installed, some exceptions apply if no liquids found in sumps. (40 CFR 264.303 and 265.303)</li> </ul>	
	<p><b>101. Response Action.</b> For new or expansion units, an approved response plan has been developed which describes the actions to be taken if action leakage rate has been exceeded. If flow rate into the leak detection system exceeded the action leakage rate for any sump, EPA was notified in writing within 7 days; a preliminary written assessment was sent to EPA within 14 days; results of determination regarding the location/size/cause of leak, determination whether waste should continue to be received, and long- and short-term actions was submitted to EPA within 30 days after notification. (40 CFR 264.304 and 265.304)</p>	

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	<p><b>102. Closure/Post-Closure.</b> Project activities involve closure of a landfill. At final closure, the owner or operator must cover the landfill or cell with a final cover designed and constructed to: provide long-term minimization of migration of liquids through the closed landfill; function with minimum maintenance; promote drainage and minimize erosion or abrasion of the cover; accommodate settling and subsidence so that the cover's integrity is maintained; and have a permeability less than or equal to the permeability of any bottom liner system or natural sub-soils present. After final closure, all post-closure requirements contained in 264.117 through 264.120, including maintenance and monitoring throughout the post-closure care period, are being complied with. If during the post-closure care period, liquid leaks into a leak detection system installed under 264.302, EPA was notified within seven days after detecting the leak. Closure plan, cost estimate and financial responsibility requirements specified in Subpart G are also being complied with. (40 CFR 264.310 and 265.310)</p>		
	<p><b>103. Reactive/Ignitable Wastes.</b> Reactive or ignitable waste are placed in landfill only if:</p> <ul style="list-style-type: none"> <li>a. It is treated, rendered, or mixed before or immediate after placement in the landfill so it is no longer reactive/ignitable; OR</li> <li>b. Ignitable waste is in non-leaking containers that are protected from sources of ignition (i.e., daily soil cover, segregation from heat-generating wastes, etc.). (40 CFR 264.17(b), 264.312(a) and (b) and 265.17(b) and 265.312(a) and (b))</li> </ul>		
	<p><b>104. Incompatible Wastes.</b> Incompatible wastes are placed in the same landfill cell only if wastes are managed to prevent:</p> <ul style="list-style-type: none"> <li>a. Extreme heat, fire or explosion;</li> <li>b. Uncontrolled toxic mists, dusts, fumes, or gases;</li> <li>c. Uncontrolled flammable vapors or gases;</li> <li>d. Damage to structural integrity of landfill; and</li> <li>e. Threat to human health and the environment. (40 CFR 264.17(b) and 265.17(b))</li> </ul>		
	<p><b>105. Bulk Liquids -- Final Status.</b> Bulk liquids are banned from disposal in landfills. Procedure is in place to prevent bulk or non-containerized liquid hazardous or non-hazardous waste or waste containing free liquids from being placed in landfill. Liquids are treated chemically or physically prior to placement in the landfill so that free liquids are no longer present. (40 CFR 264.314(b) and (e), 264.13)</p>		

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	<p><b>106. Containerized Liquids.</b> Containerized liquids are only placed in the landfill under the following conditions:</p> <ul style="list-style-type: none"> <li>a. Free-standing liquid has been removed;</li> <li>b. Waste has been mixed with absorbents or solidified so that free-standing liquid is no longer observed;</li> <li>c. Container is very small, such as an ampule;</li> <li>d. Container is designed to hold free liquids for use other than storage, such as a battery or capacitor; OR</li> <li>e. Container is a lab pack. (40 CFR 264.314(d) and 265.314(d))</li> <li>f. Absorbents used to treat free liquids are non-biodegradable. (40 CFR 264.314(e) and 265.314(f))</li> </ul>		
	<p><b>107. Empty Containers.</b> Empty containers are reduced in volume (i.e., shredded) prior to disposal in a landfill. Containers meet definition of "empty" prior to disposal. (40 CFR 264.315 and 265.315).</p>		
	<p><b>108. Dioxin-Containing Wastes – Final Status.</b> Waste codes F020-F023, F026, and F027 are not placed in a landfill unless it is operated in accordance with a management plan approved by EPA/state. Additional design requirements, if any, are being complied with. (40 CFR 264.317)</p>		
	<p><b>109. State-Specific Requirements.</b> Landfill complies with state-specific requirements. (State Hazardous Waste Regulations)</p>		
<b>Incinerators</b>			
	<p><b>110. Exemption.</b> Incinerator is exempt from all requirements of this subpart except 40 CFR 264.341 (Waste analysis) and 264.351 (Closure) [40 CFR 265.351 for interim status] because waste meets requirements specified in 40 CFR 264.340(b) and (c) or 265.340(b) and (c).</p>		
	<p><b>111. Waste Analysis.</b> For final status facility, waste analysis of feed was provided as part of trial burn plan or with Part B application and during normal operation waste feed to incinerator is being analyzed as specified in the permit. For interim status unit, waste which has not been previously burned has been sufficiently analyzed so that steady-state (normal) operating conditions (including waste and auxiliary fuel feed and air flow) and pollutants which might be emitted have been determined. Minimum analysis includes: heat value of waste, halogen, sulfur, lead and mercury content. Waste analysis is placed in operating record. (40 CFR 264.341, 40 CFR 265.341)</p>		
	<p><b>112. Principal Organic Hazardous Constituents (POHCs) – Final Status.</b> POHCs in the waste feed are being treated to meet performance standard of 40 CFR 264.343. During trial burn, POHCs are meeting trial burn requirements specified in 40 CFR 270.62. (40 CFR 264.342)</p>		
	<p><b>113. Performance Standards -- Final Status.</b> Incinerator is designed, constructed, and maintained so that, when operated in accordance with operating requirements specified below in #6, unit meets performance standards specified in 40 CFR 264.343.</p>		

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	<b>114. Permit -- Final Status.</b> Incinerator is burning only wastes specified in permit and under operating conditions, unless burning is being conducted under trial burn approved under 40 CFR 270.62 or is subject to exemption specified in 40 CFR 264.340. A permit modification/new permit was obtained to burn other hazardous wastes, if applicable. (40 CFR 264.344)	
	<b>115. Operating Conditions -- Final Status.</b> Incinerator is operating in accordance with operating requirements specified in the permit which include: composition of the waste feed (including acceptable variations in the physical or chemical properties of the waste feed which will not affect compliance with the performance requirement); CO in the stack exhaust gas; waste feed rate; combustion temperature; appropriate indicator of combustion gas velocity; allowable variations in incinerator system design or operating procedures; and other operating requirements as are necessary to ensure that the performance standards are met. These standards apply to start-up and shutdown. Standards specified in 40 CFR 264.345 for controlling fugitive emissions and operation of automatic shutoff/cutoff systems are also being met. (40 CFR 264.345).	
	<b>116. Operating Conditions -- Interim Status.</b> During start-up and shut-down of an incinerator, hazardous waste is not being fed into unit unless the incinerator is at steady state (normal) conditions of operation, including steady state operating temperature and air flow. (40 CFR 265.345)	
	<b>117. Monitoring and Inspections -- Interim Status.</b> During hazardous waste burning, specified instruments are monitored at least every 15 minutes (waste feed gauge, auxiliary fuel feed gauge, CO gauge, air flow gauge, temperature, scrubber flow, scrubber pH gauge, and relevant level controls). Daily inspection is conducted of: a. Pumps, valves, conveyors, and pipes for leaks, spills, and fugitive emissions; b. Emergency shutdown controls; and c. System alarms. Inspections logs are kept in the project files (40 CFR 265.347 and 265.15)	
	<b>118. Monitoring and Inspections -- Final Status.</b> Continuous monitoring of combustion temperature, waste feed rate, and combustion gas velocity is being conducted. Pumps, valves, conveyors, and pipes are monitored daily for leaks, spills or fugitive emissions. Waste feed cut-off and associated alarms are monitored at least weekly. Inspections logs are kept in project files. (40 CFR 264.347)	
	<b>119. Closure.</b> All hazardous waste and hazardous waste residues (including, but not limited to, ash, scrubber waters, and scrubber sludges) from the incinerator site is removed at closure. (40 CFR 364.351 and 265.351)	

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	<b>120. Dioxin Containing Wastes -- Interim Status.</b> If unit is burning F020, F021, F022, F023, F026, or F027 wastes, a certification has been obtained demonstrating that unit meets the performance standards of 40 CFR 264, Subpart O. (40 CFR 265.352)	
	<b>121. Waste Residues and Treated Wastes.</b> Solid wastes generated from the treatment, storage or disposal of hazardous waste must be properly managed. Verify if any of the following have been generated: ash, scrubber liquids, refractory material, scrubber filters, etc.	
	<b>122. State-Specific Requirements.</b> Incinerator complies with state-specific requirements. (State Hazardous Waste Regulations)	
<b>Thermal Treatment Units.</b> (This section applies to interim status facilities only.)		
	<b>123. Operation.</b> Thermal unit is operated at steady-state conditions whenever waste is added to the unit, including startup and shutdown periods. For continuous feed processes, written procedures have been developed to ensure that process is operating at steady-state before adding hazardous waste. (40 CFR 265.373)	
	<b>124. Waste Analysis Plan.</b> A written waste analysis plan has been developed. Waste analysis is performed on hazardous waste not previously burned. Written procedures incorporate the analysis results into operating parameters that establish the steady-state conditions. Waste analysis plan includes: heat value, halogen content, sulfur content, concentration of lead, mercury and PCBs. Lead and mercury analysis are not required if facility has written, documented data that show elements are not present. Waste analysis is documented in the operating record. (40 CFR 265.375)	
	<b>125. Monitoring and Inspections.</b> Instruments related to combustion and emission control are monitored at least every 15 minutes (waste feed gauge, auxiliary fuel feed gauge, treatment process temperature gauge, process flow gauge, afterburner/temperature controls, O <sub>2</sub> and CO meters, process levels, etc.). Stack plume emissions are monitored at least hourly (for color and opacity). Daily inspection is conducted of: a. Pumps, valves, conveyors, and pipes for leaks, spills, and fugitive emissions; b. Emergency shutdown controls; and c. System alarms. Inspections logs are kept in the project files. (40 CFR 265.377 and 265.15)	
	<b>126. Contingency Planning.</b> Written contingency plan has been developed to ensure that corrective actions are initiated when operating conditions based upon combustion and emission control instruments or observation of emission plume change. Procedures are being followed. (40 CFR 265.377)	

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	<b>127. Detonation of Explosives.</b> Project involves the open burning or detonation of waste explosives and detonation meets distance requirements specified in 40 CFR 265.382. Written procedure is in place to prohibit open burning of hazardous waste (except waste explosives).		
	<b>128. Closure.</b> At closure, all hazardous waste and hazardous waste residues (including, but not limited to, ash) are removed from the thermal treatment process or equipment. (40 CFR 265.381)		
	<b>129. Dioxin Containing Wastes -- Interim Status.</b> If unit is burning F020, F021, F022, F023, F026, or F027 wastes, a certification has been obtained demonstrating that unit meets the performance standards of 40 CFR 264, Subpart O. (40 CFR 265.382)		
	<b>130. Waste Residues and Treated Wastes.</b> Solid wastes generated from the treatment, storage or disposal of hazardous waste must be properly managed. Verify if any of the following have been generated: ash, scrubber liquids, refractory material, scrubber filters, etc.		
	<b>131. State-Specific Requirements.</b> Unit complies with state-specific requirements. (State Hazardous Waste Regulations). Refer to WMP for requirements.		
<b>Chemical, Physical, and Biological Treatments.</b> (Applies to interim status facilities only.)			
	<b>132. Operating Procedure.</b> Written procedure is in place that describes the types of wastes that are not permitted to be added to the treatment systems and specifies all operating and safety procedures. Chemical, physical, or biological treatment of hazardous waste complies with 40 CFR 265.17(b). Hazardous wastes or treatment reagents are not placed in the treatment process or equipment if they could cause the treatment process or equipment to rupture, leak, corrode, or otherwise fail before the end of its intended life. Where hazardous waste is continuously fed into a treatment process or equipment, the process or equipment is equipped with a means to stop the inflow (e.g., a waste feed cut-off system or by-pass system to a standby containment device). (40 CFR 265.401)		
	<b>133. Waste Analysis Plan.</b> A written waste analysis plan has been developed. If hazardous waste being treated is substantially different from any hazardous waste previously treated, or if a substantially different process than previously used is being used to chemically treat the waste, waste analysis and treatment tests are being performed OR written, documented information on similar treatments of similar wastes is kept in project files. (40 CFR 265.13, 265.402, 265.17 and 265.401(a))		

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	<p><b>134. Inspections.</b> Daily inspections are being conducted of</p> <ul style="list-style-type: none"> <li>a. Discharge control and safety equipment; and</li> <li>b. Data gathered from monitoring equipment.</li> </ul> <p>Weekly inspections of construction materials used in the treatment process or equipment are conducted to detect signs of corrosion or leakage. Inspection logs are maintained in the project files documenting conduct of these inspections. (40 CFR 265.403, 265.15 and 265.73)</p>	
	<p><b>135. Incompatible Wastes.</b> Incompatible wastes are placed in the same treatment process only if wastes are managed to prevent:</p> <ul style="list-style-type: none"> <li>a. Extreme heat, fire or explosion;</li> <li>b. Uncontrolled toxic mists, dusts, fumes, or gases;</li> <li>c. Uncontrolled flammable vapors or gases;</li> <li>d. Damage to structural integrity of landfill; and</li> <li>e. Threat to human health and the environment. (40 CFR 265.17(b))</li> </ul> <p>If waste is placed in a treatment unit that previously held an incompatible waste, procedures are in place to ensure that equipment is properly washed prior to placing incompatible waste in unit. (40 CFR 265.406(b))</p>	
	<p><b>136. Reactive/Ignitable Wastes.</b> Reactive or ignitable waste are treated to prevent ignition or reaction.</p> <ul style="list-style-type: none"> <li>a. It is treated, rendered, or mixed before or immediately after placement in the treatment process so it is no longer reactive/ignitable;</li> <li>b. Treated in a manner that does not threaten human health or the environment; OR</li> <li>c. Treated so that it is protected from any material or condition that may cause the waste to ignite or react. (40 CFR 265.17(b), 265.405(a)(1) and (2))</li> </ul>	
	<p><b>137. Closure.</b> At closure, all hazardous waste and hazardous waste residues are removed from treatment processes or equipment, discharge control equipment, and discharge confinement structures. (40 CFR 265.404)</p>	
	<p><b>138. Waste Residues and Treated Wastes.</b> Residues from hazardous waste treatment process are hazardous waste unless specifically exempt. Verify that treatment residue is managed as hazardous waste or is delisted. (40 CFR 261.3(c) and (d), 260.22 and 265.404)</p>	
	<p><b>139. State-Specific Requirements.</b> Unit meets state-specific requirements. (State Hazardous Waste Regulations)</p>	
<b>Land Treatment Units</b>		

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	<b>140. Design and Operation.</b> Unit is designed and operated in accordance with permit conditions. Land treatment program has been established in accordance with 40 CFR 264.271 that is designed to ensure that hazardous constituents placed in or on the treatment zone are degraded, transformed, or immobilized within the treatment zone. For interim status unit, hazardous waste is not placed in or on a land treatment facility unless the waste can be made less hazardous or nonhazardous by degradation, transformation, or immobilization processes occurring in or on the soil. (40 CFR 264.273(a) and 265.272(a))		
	<b>141. Treatment Demonstration. -- Final Status.</b> Treatment demonstration has been conducted for each waste that will be applied to the treatment zone in accordance with 40 CFR 264.272.		
	<b>142. Waste Analysis -- Interim Status.</b> Before hazardous waste was placed in or on a land treatment facility, waste analysis was conducted in accordance with 40 CFR 265.273.		
	<b>143. Run-on/Runoff Control.</b> Treatment zone is designed, constructed, operated and maintained to minimize runoff of hazardous constituents. Runon control system is capable of preventing flow onto the treatment zone during peak discharges from at least a 25-year storm. Runoff control system is capable of collecting and controlling at least water volume from a 24-hour, 25-year storm. Collection and holding facilities associated with runon/runoff system are managed to maintain the design capacity of the system. (40 CFR 264.273 and 265.272)		
	<b>144. Wind Dispersal Control.</b> Treatment zone contains particulate matter and wind dispersal is being controlled. (40 CFR 264.273(f) and 265.272(e))		
	<b>145. Inspections – Final Status.</b> Treatment unit is inspected weekly and after storms to detect deterioration, malfunctions, or improper operation of the runon/runoff control systems and improper functioning of wind dispersal control measures. Inspection logs are being maintained in the on-site project files. (40 CFR 264.273(g))		
	<b>146. Monitoring.</b> If unit is conducting unsaturated zone monitoring such monitoring is being conducted in accordance with permit conditions or monitoring plan. (40 CFR 264.278 and 265.278)		
	<b>147. Significant Increase of Hazardous Constituents -- Final Status.</b> If a significant increase in hazardous constituents below the treatment zone has occurred, the EPA/state was notified within 7 days and an application for a permit modification was submitted within 90 days of this increase. (40 CFR 264.278(g))		

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	<p><b>148. Reactive/Ignitable Wastes.</b> Reactive or ignitable waste are treated to prevent ignition or reaction.</p> <p>a. It is immediately incorporated into the soil so that they no longer meet the definition of ignitability or reactivity; OR</p> <p>b. It is managed to prevent ignition or reaction. (40 CFR 264.281 and 265.281)</p>	
	<p><b>149. Incompatible Wastes.</b> Incompatible wastes are treated in separate treatment zones or other adequate precautions are taken to prevent reactions from occurring. (40 CFR 264.282 and 265.282)</p>	
	<p><b>150. Treatment of Dioxins -- Final Status.</b> Waste codes F020 - F023 or F026 - F027 are treated and facility has a management plan approved by EPA/state for treatment of these wastes. (40 CFR 264. 283)</p>	
	<p><b>151. Recordkeeping.</b> Hazardous waste application dates and rates are included in the operating record required under 40 CFR 264.73 and 265.73. (40 CFR 264.279 and 265.279)</p>	
	<p><b>152. Closure.</b> Land treatment unit is being properly closed.</p> <p>a. Operations necessary to maximize degradation, transformation, or immobilization of waste and minimize run-on/runoff and wind dispersal will continue through closure.</p> <p>b. Vegetative cover is being established and maintained.</p> <p>c. Unsaturated zone monitoring is being continued.</p> <p>d. Soil pore monitoring is continued for 90 days after last waste application</p> <p>e. Closure has been certified by independent qualified soil scientist or independent registered professional engineer. (40 CFR 264.280 and 265.280)</p>	
	<p><b>153. State-Specific Requirements.</b> Land treatment unit complies with state-specific requirements. (State Hazardous Waste Regulations)</p>	
<b>Miscellaneous Units (Applies to final status units only.)</b>		
	<p><b>154. Design and Operation.</b> Unit is designed and operated in accordance with permit conditions, including but not limited to:</p> <p>a. Prevention of migration of waste constituents in groundwater or subsurface environment;</p> <p>b. Prevention of migration of waste constituents in surface water, wetlands, or soil surface;</p> <p>c. Prevention of migration of waste constituents to air; and</p> <p>d. Procedures regarding monitoring and analysis, inspection, emergency response, spill reporting, and corrective action. (40 CFR 264.600 - 603)</p>	

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<b>155. Monitoring, Analysis, Inspection, Response, Reporting, and Corrective Action.</b> Monitoring, testing, analytical data, inspections, response, and reporting procedures and frequencies have been developed and are being implemented to comply with 40 CFR 264.601, 264.15, 264.33, 264.75, 264.76, 264.77, and 264.101 as well as meet any additional requirements needed to protect human health and the environment as specified in the permit. (40 CFR 264.602)	
	<b>156. Closure.</b> Plan is in place for closure and if all contamination cannot be completely removed, post closure plan is in place. (40 CFR 264.603)	
	<b>157. State-Specific Requirements.</b> Miscellaneous unit complies with state-specific requirements. (State Hazardous Waste Regulations)	
<b>Boilers And Industrial Furnaces</b>		
	<b>158. Interim Status.</b> Project involves the construction or operation of a BIF which is operating under interim status. The unit complies with 40 CFR 266.103 and 266.104 requirements.	
	<b>159. Final Status.</b> Project involves the construction or operation of a BIF which is operating under a final status permit. The unit complies with 40 CFR 266.100, 270.22 and 270.66 requirements.	
<b>Groundwater Monitoring</b>		
	<b>160. Solid Waste Management Unit – Final Status.</b> Facility has SWMUs that are subject to the groundwater monitoring program. Sampling for each hazardous constituent or monitoring parameters as specified in the permit are being met. Groundwater monitoring plan which was approved by the state/EPA is being implemented. (40 CFR 264.90 - .101)	
	<b>161. Monitoring At Interim Status Facilities.</b> Project involves activities at a surface impoundment, landfill, or land treatment facility which is used to manage hazardous waste and is required to implement a groundwater monitoring program. The groundwater monitoring system is designed in accordance with 40 CFR 265.91, sampling and analysis is conducted in accordance with 40 CFR 265.92, groundwater quality assessment program meets 40 CFR 265.93 requirements, and reports/recordkeeping requirements specified in 40 CFR 265.94 are met. <i>Note: Facility may have obtained a waiver from these requirements if the criteria specified in 40 CFR 265.90(c) - (e) were met.</i>	
<b>Corrective Action Management Units Facilities (Applies to final status facilities only.)</b>		

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	<p><b>162. Designated Area.</b> Area at the facility has been designated as CAMU. The permit or order specifies the areal configuration of the CAMU, requirements for remediation waste management (including design, operation and closure requirements) and requirements for groundwater monitoring. If a regulated unit is designated as a CAMU or a regulated unit is incorporated into a CAMU, Subpart F, G, and H requirements and the unit-specific requirements of part 264 or 265 that applied to that regulated unit will continue to apply to that portion of the CAMU after incorporation into the CAMU. (40 CFR 264.552)</p>	
	<p><b>163. Closure.</b> Closure of the CAMU will minimize the need for further maintenance and control to the extent necessary to protect human health and the environment. For areas where wastes remain in place, closure will minimize the post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground, to surface waters, or to the atmosphere. Closure may include excavation, removal, treatment or containment of wastes; and removal and decontamination of equipment, devices, and structures used in remediation waste management activities within the CAMU. Post-closure requirements are being implemented as necessary to protect human health and the environment, to include, for areas where wastes will remain in place, monitoring and maintenance activities, and the frequency with which such activities shall be performed to ensure the integrity of any cap, final cover, or other containment system. (40 CFR 264.552(e) and (f))</p>	
	<p><b>164. Documentation.</b> EPA has documented the rationale for designating the CAMU. (40 CFR 264.552(g))</p>	
	<p><b>165. Incorporation Into Permit.</b> CAMU has been incorporated into existing permit. Such incorporation has been approved by the EPA according to the procedures for Agency-initiated permit modifications under 40 CFR 270.41 or according to the permit modification procedures of 40 CFR 270.42. (40 CFR 264.552(h))</p>	
	<p><b>166. Temporary Unit.</b> Temporary tanks and container storage areas are being used for treatment or storage of hazardous remediation wastes. EPA has determined that a design, operating, or closure standard applicable to such units may be replaced by alternative requirements which are protective of human health and the environment. EPA has specified the length of time a temporary unit will be allowed to operate, (which is no longer than one year), and the design, operating, and closure requirements for the unit. The operational period of a temporary unit may be extended once for one year beyond that originally specified in the permit or order and such extension has been approved as agency-initiated permit modification or a Class II modification. (40 CFR 264.552)</p>	

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Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

**Training**

	<b>167. General.</b> Personnel have completed program of classroom or on-the-job training that teaches them to perform their duties. Training has been conducted within 6 months after project start/untrained personnel are supervised. (40 CFR 264.16(a) and (b) and 265.16(a) and (b))	
	<b>168. Annual Refresher.</b> Personnel have undergone annual refresher training. (40 CFR 264.16(c) and 265.16(c))	
	<b>169. Personnel Records.</b> Records are maintained on-site which include: job title of each position at facility and name of person filling it; job description of each position; written description of type/amount of training for each position; and records documenting training. (40 CFR 264.16(d) and 265.16(d))	
	<b>170. Training Records.</b> Training records are kept on-site until project closure. If employee leaves, records are kept for at least 3 years from date of last employment. (40 CFR 264.16(e) and 265.16(e))	

**Preparedness and Prevention**

	<b>171. Controlled Entry/Security.</b> The following security measures are installed at the hazardous waste portion of the project site. (40 CFR 264.14 and 265.14) a. Area is surrounded by a fence or natural barrier. b. Entrances are locked or monitored on a 24-hour basis. c. Signs with "Danger-Unauthorized Personnel Keep Out" are posted at each entrance and other locations as appropriate. d. Signs are legible from at least 25 feet and are written in English or other language predominant in the area.	
	<b>172. Management of Project.</b> Project is managed to minimize the possibility of fire, explosion, or any sudden releases to the environment. (40 CFR 264.31 and 265.31)	
	<b>173. Equipment.</b> Project site is equipped with: a. Internal communication or alarm system. b. Telephone or hand-held two-way radio capable of summoning help. c. Spill control, and decontamination equipment, and d. Portable fire extinguisher, fire control equipment, water to supply fire hoses, foam equipment or sprinklers (if flammable wastes on-site). (40 CFR 264.32 and 265.32)	
	<b>174. Testing.</b> Equipment is tested/maintained to assure proper operation and records are kept of testing. (40 CFR 264.33 and 265.33)	
	<b>175. Waste Handling Procedure.</b> Whenever waste is being poured, mixed, spread, or handled, all personnel have immediate access to internal alarm or emergency communication device. When only one employee is on-site, he/she has immediate access to communication device. (40 CFR 264.34 and 265.34)	

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<b>176. Aisle space.</b> Proper aisle space is maintained to allow unobstructed movement of personnel, fire, spill control, and decon equipment. Three feet is considered GMP. (40 CFR 264.35 and 265.35)	
	<b>177. Local Arrangements.</b> Arrangements have been made with emergency response agencies. (40 CFR 264.37 and 265.37)	
	<b>178. Ignitable/Reactive/Incompatible Wastes.</b> The following is being performed: a. Waste is separated and confined from sources of ignition or reaction, sparks, spontaneous ignition, and radiant heat. b. Smoking and open flames are confined to specifically designated areas. c. "No Smoking" signs are posted in areas where ignitable or reactive wastes are handled. d. Incompatible wastes are always separated. e. Written procedures for avoiding commingling of incompatible wastes have been developed and are being implemented. f. Flammable/ignitable wastes are grounded. (40 CFR 264.17 and 265.17)	
	<b>179. Contingency Planning</b>	
	<b>180. Hazardous Waste Contingency Plan.</b> Facility has a HWCP or SPCC Plan which has been amended to include hazardous waste requirements. The plan includes requirements specified in 40 CFR 264.52 or 265.52. (40 CFR 264.51 and .52, and 265.51 and .52)	
	<b>181. Copies.</b> HWCP is maintained at the project site and submitted to local emergency response agencies, as appropriate. (40 CFR 264.53 and 265.53)	
	<b>182. Revision of HWCP.</b> HWCP is reviewed and amended immediately when: a. Regulations change, b. Plan failed in an emergency, c. Increased potential for emergency from changes in project/facility, d. List of emergency coordinators changes, and e. List of emergency equipment changes.	
	<b>183. Emergency Coordinator Responsibilities.</b> On-site emergency coordinator is familiar with HWCP, operations, location/characteristics of wastes, location of records, facility layout; is on-call or on facility (or has designated alternate); and is authorized to commit resources to implement HWCP. (40 CFR 264.55 and 265.55)	
	<b>184. Implementation of Plan.</b> During emergency, requirements/responsibilities of emergency coordinator, implementation of plan, and notification were properly conducted. (40 CFR 264.56 and 265.56)	

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Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

**Off-site Transportation/Disposal**

	<p><b>185. Transporter.</b> Hazardous wastes are offered only to transporters with proper EPA Identification Numbers. (40 CFR 262.12(c))</p>	
	<p><b>186. Prequalification.</b> Hazardous wastes are transported by and disposed only by prequalified transporters and disposal, treatment, or recycling facilities (EHS 1-4).</p>	
	<p><b>187. Manifesting.</b> Completed manifests are used each time a regulated hazardous waste is transported off-site. (40 CFR 262.20-23; 49 CFR 172.604). All required data has been inputted and manifest is properly signed by both the generator and transporter. If TtEC personnel sign the manifest, there is written authorization from the generator and this authorization has been reviewed by ESQ Dept.</p>	
	<p><b>188. Packaging/Labeling/Placarding.</b> Prior to off-site transport each hazardous waste is:</p> <ul style="list-style-type: none"> <li>a. Packaged and labeled in accordance with DOT requirements.</li> <li>b. If 110 gallons or less, marked with commercial label designated "Hazardous Waste" and contact information.</li> <li>c. Marked with generator's name, address, and manifest document number.</li> <li>d. Placarded in accordance with DOT requirements. (40 CFR 262.30 - .32)</li> </ul>	

**Receiving Offsite Waste**

	<p><b>189. Manifest/Shipping Paper Review.</b> All manifests and shipping papers are reviewed for waste received from offsite sources. Each manifest is signed and dated; discrepancies are noted; transporter is given one copy; copy is returned to generator within 30 days. (40 CFR 264.71 and 265.17)</p>	
	<p><b>190. Discrepancies.</b> Significant discrepancies are reported on all shipments received: quantity variations greater than 10% for bulk waste; any variation in piece count for batch waste, and obvious differences of waste type. In addition, such discrepancies are reconciled with generator or transporter within 15 days OR if not, letter is sent to EPA. (40 CFR 264.72 and 265.72)</p>	
	<p><b>191. Unmanifested Waste Reports.</b> If a facility accepts for treatment, storage, or disposal waste from off-site source without an accompanying manifest (and waste is not excluded from the manifest requirement), "Unmanifested Waste Report" (EPA form 8700-13B) was submitted to EPA within fifteen days after receiving the waste.</p>	

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<p><b>192. Restricted Waste Disposal.</b> If a facility accepts for treatment, storage, or disposal waste from off-site source which is restricted from land disposal, records are maintained of all notices and certifications pertaining to land disposal. (40 CFR 268.7(c)(1))</p> <p>a. <b>Recordkeeping.</b> Records are maintained of all notices and certifications pertaining to land disposal. (40 CFR 268.7(c)(1))</p> <p>b. <b>Sampling and Analysis.</b> Waste or extract of waste must be tested to ensure waste is in compliance with treatment standards. Verify:</p> <ul style="list-style-type: none"> <li>• Waste analysis plan contains frequency and analytical methods.</li> <li>• Operating record demonstrates waste analysis plan is being implemented.</li> <li>• Laboratory analysis demonstrates waste disposed of meets LDRs.</li> </ul>	
	<p><b>193. Receiving Off-site Waste.</b> If the project activities include receiving hazardous waste from a foreign source, a notice was filed with EPA at least 4 weeks prior to waste arrival. If project is receiving hazardous waste from off-site source, the facility owner informed generator in writing that facility has appropriate permits and will accept waste that is being shipped. (40 CFR 264.12 and 265.12)</p> <p>a. Written notice is maintained in project's operating record.</p> <p>b. Project is approved to handle specified waste type.</p>	
<b>Import/Export</b>		
	<p><b>194. Export.</b> Hazardous wastes are being exported outside the U.S. for treatment, storage or disposal. Notification of intended export was sent to EPA, EPA's acknowledged consent was sent to receiving country, and manifesting and reporting requirements are being met. (40 CFR 262.50 - .57)</p>	
	<p><b>195. Import.</b> Hazardous wastes are being imported to the facility for treatment, storage or disposal from a foreign country. Manifests have been properly completed for these wastes. (40 CFR 262.60)</p>	
<b>Onsite Transportation</b>		
	<p><b>196. Management Practices.</b> Onsite transportation of hazardous wastes between buildings is accomplished using good management practices to ensure against spills, releases, and accidents. Procedures exist to manage movement of hazardous wastes throughout the site, drivers are trained in spill response, provisions are made to secure waste in vehicles, and site contingency plan covers accidents during transport.</p>	
	<p><b>197. Crossing Public Roads.</b> Onsite transportation of hazardous wastes involves crossing public roads. If so, offsite transportation requirements must be complied with and facility must be permitted as a transporter. (40 CFR 263)</p>	

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Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

**Recordkeeping.** *Note: These are generator requirements; Tetra Tech EC normally is not a generator, but assists clients in managing their wastes. However, Tetra Tech EC may keep some or all of these records depending upon contractual requirements. It is GMP to keep records if Tetra Tech EC is involved in off-site transport or disposal.*

	<p><b>198. Operating Record.</b> Operating record contains the following:</p> <ul style="list-style-type: none"> <li>a. Description, quantity and date of placement of each shipment of waste received. This information should cross-reference the manifest number.</li> <li>b. Location of waste at the facility.</li> <li>c. Records and results of waste analysis and trial tests.</li> <li>d. Report on incidents.</li> <li>e. Records/results of inspections in accordance with 40 CFR 264.17 and 265.17.</li> <li>f. Monitoring, testing, and analytical data.</li> <li>g. Copies of LDR notices and certifications.</li> <li>h. Records of quantities of waste placed in land disposal under extension of effective date of any LDR.</li> <li>i. Closure and, for disposal facilities, post-closure plans and cost estimates. Verify closure plan and post-closure plans are up-to-date, reflects all units currently operating, was amended if operating, design or closure plans have changed, and notices sent to EPA to amend plans, if applicable.</li> <li>j. Annual waste minimization program certifications. (40 CFR 264.73, 265.74, 268.7 and 268.8)</li> </ul>	
	<p><b>199. Generator Records If Waste Shipped Off-site.</b> Records are kept on-site for at least 3 years (or in project files if project ends earlier) of the following:</p> <ul style="list-style-type: none"> <li>a. Copy of signed manifests from TSDf which received waste.</li> <li>b. Copy of exception reports.</li> <li>c. Records to characterize wastes. (40 CFR 262.40)</li> </ul>	
	<p><b>200. Biennial/State Report.</b> Biennial Report has been prepared and submitted by March 1 of each even numbered year or according to timing and schedule of state requirement. Copy of report is kept for 3 years. (40 CFR 264.75, 265.75 and 262.41)</p>	
	<p><b>201. Facility Reports.</b> The following reports, if applicable, have been prepared, signed, and submitted:</p> <ul style="list-style-type: none"> <li>a. Any release from solid waste management unit.</li> <li>b. Fires and explosions.</li> <li>c. Groundwater detection monitoring program.</li> <li>d. Compliance monitoring program.</li> <li>e. Corrective action program.</li> <li>f. Surface impoundment, waste pile, land treatment, and land disposal unit monitoring.</li> <li>g. Certification of closure for hazardous waste surface impoundment, waste pile, land treatment, and landfill units. (40 CFR 264.77 and 265.77)</li> </ul>	

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	
	<b>202. Exception Reports.</b> If copy of signed manifest from TSDF was not received within 35 days from off-site transport, transporter was contacted. If the manifest was not received within 45 days, exception report was filed with EPA (state). (40 CFR 262.43)		
	<b>203. LDR Certification/Notices/Waste Analysis.</b> Copies of all data to support characterization either based upon knowledge of waste or testing, notices, certifications, and demonstrations are kept on-site/in project files for at least 5 years. (40 CFR 268.7(a)(5))		
<b>Land Disposal Restrictions</b>			
	<b>204. Notice/Certification.</b> Initial Off-site shipment of waste has generator notice and certification that waste meets/does not meet LDRs (waste number, treatment standard under 40 CFR 268, five letter treatment code, if applicable, manifest number, and waste analysis data. (40 CFR 268.7(a) and (b))		
	<b>205. Variance/Extension/Exemption.</b> If hazardous waste is subject to exemption, variance, or extension from LDR requirements, notice is submitted to TSDF that waste is not prohibited from land disposal. (40 CFR 268.7(a)(3))		
	<b>206. Exemption.</b> If waste is determined to be exempt from RCRA subtitle C subsequent to the point of generation, a one-time notice stating this determination is placed in the project files. (40 CFR 268.7(a)(6))		
	<b>207. Compliance with LDRs.</b> Disposal of hazardous wastes meet treatment standards specified in 40 CFR 268.40 and applicable Universal Treatment Standards in 40 CFR 268.48, unless variance, exemption, or extension has been granted. (40 CFR 268)		
	<b>208. Debris.</b> Debris which contains a listed waste or is characteristically hazardous has: a. Obtained a contained-in determination by EPA under 40 CFR 261 b. Has been treated and meets the performance standards specified in 40 CFR 268.45 and is therefore no physical or chemical extraction longer regulated as hazardous. c. Meets the land disposal restrictions in 40 CFR 268.40 and applicable Universal Treatment Standards of 40 CFR 268.48. d. Residues from treatment of hazardous debris must be managed as a hazardous waste and meet 40 CFR 268 standards prior to land disposal.		

--End Checklist--

**EHS 3-3 ATTACHMENT C  
TETRA TECH EC, INC.  
PESM INSPECTION CHECKLIST - HAZARDOUS WASTE: STORAGE/TREATMENT/DISPOSAL  
IN LESS THAN 90 DAYS**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

This checklist applies when client (or Tetra Tech EC, Inc., if applicable) qualifies as a large quantity generator. A large quantity generator is defined in the federal regulations as any one who generates 1) greater than 1,000 kg per month; 2) 1 kg of an acutely hazardous waste; or 3) 100 kg/month of soil or other material contaminated with an acutely hazardous waste. State regulations should be consulted for state-specific definitions.

<b>General Requirements</b>		
		<p><b>1. ESS or Designated Waste Management Role.</b> Discuss Role of ESS or designated individual with regards to waste management at the site.</p> <p>a. How is waste management handled &amp; is it working effectively?</p> <p>b. What types of problems have been encountered?</p> <p>c. Is ESS or designated individual receiving regulatory support from ESQ Env. Compliance/Regulatory Specialists as needed?</p> <p>d. Does ESS or designated individual have the required training and knowledge?</p>
		<p><b>2. Waste Classification.</b> Waste is characterized as hazardous or state-regulated hazardous waste.</p> <p>Waste containers that are stored pending sample results are labeled as "Hazardous Waste-Pending Analysis," are dated with an accumulation start date (ASD), and are in compliance with 90-day accumulation period while awaiting waste classification.</p>
		<p><b>3. EPA Identification Number.</b> Generator has obtained EPA Identification number to store &amp; offer waste for transport. (40 CFR 262.12)</p>
<b>Container Storage</b>		
		<p><b>4. Storage Requirements.</b> Review weekly inspection forms for container &amp; storage area requirements and inventory/tracking. Perform field observations to document how the requirements are being met and check condition of containers, including marking and labeling requirements. (40 CFR 262.34 and 40 CFR 265.171-177)</p>
		<p><b>5. Inspections.</b> Containers &amp; storage area are inspected at least weekly &amp; written records are kept of these inspections as well as corrective actions documentation. (40 CFR 265.174; GMP)</p>
		<p><b>6. Incompatibility.</b> Check to see if incompatible wastes are stored without adequate separation or berms, as applicable. (40 CFR 265.177; GMP)</p>

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 IN LESS THAN 90 DAYS

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

	<p><b>7. Air Emissions.</b> Containers comply with management standards specified in 40 CFR Part 265.1030, -.1050, and -.1080 (<b>Contact ESQ Env. Compliance Specialist for assistance</b>).</p> <p><b>a.</b> If there are process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air/steam stripping of hazardous wastes with organic concentrations of 10 ppm or greater, the operator must calculate emissions &amp; operate equipment within those specified emissions (40 CFR 265 Subpart AA).</p> <p><b>b.</b> If there is equipment that contains or contacts hazardous waste having organic concentrations of 10 ppm or greater, the Subpart BB standards are followed for various equipment. (40 CFR 265 Subpart BB).</p> <p><b>c.</b> If there are tanks that contain hazardous waste, the tanks must meet specific design criteria in Subpart CC (<i>Note: Superfund sites &amp; RCRA Corrective Actions are exempt</i>). If haz. waste is stored in surface impoundments, there must be emissions controls per Subpart CC. (40 CFR 265 Subpart CC).</p>	
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	<p><b>8. State-Specific Requirements.</b> Storage area meets state-specific requirements, which may include secondary containment. <b>See the Site Health &amp; Safety Plan (or Project Waste Management Plan) for additional requirements.</b></p>	
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**Satellite Accumulation**

	<p><b>9. Designated Area and Marking.</b> A designated area has been established to accumulate waste (posted as such) &amp; area is marked with caution signage or tape on the floor.</p>	
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	<p><b>10. Quantity and Location.</b> A total of less than 55 gallons of haz. waste (or 1 quart of acutely haz. waste) is being accumulated at the location where the waste is generated and is within control of the person generating the waste. (40 CFR 262.34(c))</p> <p>Ex.: NAPL removed from a monitoring well is accumulated in a 55-gal. drum &amp; stored next to the well, and drum contains less than 55 gallons.</p> <p>Ex.: Five gallon pails of spent solvent haz. waste are stored in a flammable cabinet in the lab where waste was generated, and the total stored is less than 55 gallons.</p>	
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		<p><b>11. Marking.</b> Containers are marked with the words "Hazardous Waste".</p> <p>NOTE: An <b>Accumulation Start Date</b> is <b>not</b> placed on the container until the total of haz. waste accumulated is equal to or more than 55 gallons of haz. waste (or 1 qt. of acutely haz. waste).</p>	
		<p><b>12. Timing.</b> Waste is dated when a total of 55 gallons of haz. waste (1 qt of acutely haz. waste) is generated and moved to a less-than-90 days or RCRA permitted storage area within 3 days.</p> <p>NOTE: If site does not have either a Less-Than-90-Days Storage Area or a RCRA Permitted haz. waste storage area, then the haz. waste must be <b>shipped off-site</b> within 3 days.</p>	
		<p><b>13. State-Specific Requirements.</b> Satellite accumulation area meets state-specific requirements. <b>See Site H&amp;S Plan</b> (or Waste Mgmt. Plan) for additional requirements.</p>	
		<p><b>14. Container Management.</b> Containers meet the same condition, compatibility, and requirements for handling as less than 90-day storage areas (<i>see #4 through #8 above</i>).</p>	

**REMEDIATION WASTE STOCKPILES (NOTE: This is not the same as a "waste pile" which is a permitted temporary waste storage area similar to a surface impoundment – these are covered in the checklist for hazardous waste permitted Facilities.)**

Not all remediation waste will be hazardous waste but RCRA has specific allowances for stockpiling of remediation waste that is hazardous *in situ* (versus in a container, tank, drip pad, containment building) without triggering LDRs or minimum technology requirements (MTRs) if the waste is managed in accordance with the Area of Contamination (AOC) policy. Remediation wastes are generated during state or federal cleanup actions (e.g., CERCLA or state CERCLA programs). Remediation waste may be debris or soil.

Note: Stockpiles of contaminated remediation waste (hazardous or not) on projects sites requires diligence and attention to BMPs because wind and rain create challenges for maintaining stockpile integrity and the spread of contamination can occur. Also, not all remediation sites have space for stockpiling within the AOC, so if direct dig and haul options exist; usually clients prefer that option.

		<p><b>15.</b> Is the remediation waste stockpile located within the AOC (contiguous contaminated area)?</p>	
		<p><b>16.</b> Stockpiles of haz. waste are tracked in a waste log to include at a minimum:</p> <ul style="list-style-type: none"> <li>a. Date of generation (accumulation start date)</li> <li>b. Dates sampled (if applicable)</li> <li>c. Characterization of waste</li> <li>d. Off-site shipment dates.</li> </ul>	
		<p><b>17.</b> Stockpiles of hazardous waste are shipped off-site within 90 days of the accumulation start date.</p>	

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES

			<p><b>18.</b> Stockpiles are designed &amp; maintained appropriately (e.g. placed on poly sheeting, bermed, and <b>covered when not in use or at the end of each day. Covers should be anchored appropriately to avoid wind lifting cover &amp; exposing waste or rain to enter into the bermed area.</b></p>	
			<p><b>19.</b> Stockpiles are inspected at least weekly and inspections are documented. BMP – even non hazardous waste stockpiles should be inspected weekly – e.g., EHS 3-3 weekly inspection checklist.</p>	

**Hazardous Waste Tanks (NOTE: DOES NOT APPLY TO TANKS THAT ARE PART OF A “PROCESS” (e.g., Wastewater Treatment collection/treatment tanks for treatment of contaminated groundwater))**

			<p><b>20. New Tanks Installed as Part of Project.</b> Project involves the installation of a tank that stores/treats hazardous waste, and the following has been performed:</p>	
			<p><b>a. Integrity Assessment.</b> There is a written assessment reviewed/certified by an independent, registered PE of tank's integrity &amp; document is kept on-site. (40 CFR 265.192(a))</p>	
			<p><b>b. Installation Inspection.</b> There is a written assessment by qualified installation inspector or registered PE that tank is properly installed &amp; document is kept on-site. (40 CFR 265.192(b) - (g))</p>	
			<p><b>21. Marking.</b> Tanks are clearly marked with the words "Hazardous Waste" and accumulation start date is clearly visible. (40 CFR 262.34(a))</p>	
			<p><b>22. Accumulation Time.</b> Waste is stored in tanks for 90 days or less, unless an extension has been obtained from the State (or EPA, if state is not authorized to implement RCRA haz. waste program). (40 CFR 262.34(b))</p>	
			<p><b>23. Containment System.</b> Applies to a new tank, existing tank storing F020-F023, F026/F027, or other specified existing tanks, unless a variance was obtained.</p>	
			<p><b>a. General Requirement.</b> Containment system is capable of detecting/collecting releases &amp; accumulated liquids until collected material is removed. (40 CFR 265.193(b)(2))</p>	
			<p><b>b. Leak Detection.</b> Containment system has leak detection system that is designed/operated to detect failure of either primary or secondary containment structure or any release of waste in system within 24 hours, or earliest practicable time. (40 CFR 265.193(c))</p>	

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 TETRA TECH EC, INC.  
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 IN LESS THAN 90 DAYS

**CONFIDENTIAL**

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<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

			<p>c. <b>Removal of Releases.</b> All spills, leaks, precipitation are removed from containment system within 24 hours. (40 CFR 265.193(c))</p>	
			<p>d. <b>Specific Design.</b> Containment is: a liner, vault, double-walled tank or other EPA/state-approved device that meets specified design requirements (e.g., suitable base, sloped, leak detection system). (40 CFR 265.193(d) and (e))</p>	
			<p>e. <b>Ancillary Equipment.</b> Ancillary equipment is provided with secondary containment. (40 CFR 265.193(f))</p> <p>Note: Not applicable to above ground piping/welded flanges, joints &amp; connections/seamless or magnetic coupling pumps and valves/pressurized aboveground piping with automatic shut-off devices that are visually inspected daily.</p>	
			<p>f. <b>Existing Tanks not yet Subject to Containment Requirement.</b> If existing tank is being utilized which is not yet subject to containment requirement, there is written assessment to leak test tank or tank integrity performed annually by registered PE &amp; document is kept on-site. (40 CFR 265.193(i))</p>	
			<p><b>24. Overfill/Spill Control.</b> Tank system includes spill prevention controls, overfill prevention controls and maintenance of freeboard in uncovered tanks to prevent overtopping. (40 CFR 265.194)</p>	
			<p><b>25. Inspection.</b> Daily inspections are performed of overfill/spill control; aboveground points of tank; monitoring/leak detection; and surrounding area. Cathodic protection systems are inspected bimonthly (and 6 months after installation). Records are kept of inspections. (40 CFR 265.195)</p>	
			<p><b>26. Spills/Releases.</b> If a spill has occurred from tank/containment system, the following must have been performed: (40 CFR 265.196)</p>	
			<p>a. <b>Waste/Released Material.</b> Waste was removed from tank as necessary to prevent further release and released material removed from containment area within 24-hours/in timely manner. (40 CFR 265.195(a)(b))</p>	
			<p>b. <b>Release to Environment.</b> A visual inspection/removal of contamination was conducted and the site-specific Environmental Compliance Spill/Release procedure was implemented. (40 CFR 265.196(c); GMP)</p>	
			<p>c. <b>Notification.</b> If release to environment occurred, proper verbal and written notification to the State agency or agencies, and EPA were conducted. (40 CFR 265.196(d))</p>	

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		<p>d. <b>Repair.</b> If after the release the tank system required major repair, the PE certification was sent to EPA/state. (40 CFR 265.198(e))</p> <p>Note: "Major repair" includes installation of internal liner, repair of ruptured containment system, etc.</p>	
		<p><b>27. Closure.</b> At closure, the standards in 40 CFR 265.197 and Subpart G were met which include removing/decontaminating waste residue, contaminated containment system, contaminated soils, structures, and equipment. (40 CFR 265.197) (<b>Contact ESQ Env. Compliance Specialist for assistance</b>).</p>	
		<p><b>28. Ignitable/Reactive.</b> If ignitable/reactive wastes are stored in tank, 1) waste is treated, rendered, or mixed before placement so that it is no longer ignitable/reactive and meets 40 CFR 265.17(b) <b>OR</b> 2) waste is stored/treated so that it is protected from material/conditions that may cause ignition/reaction <b>OR</b> 3) tank system is used solely for emergencies <b>AND</b> NFPA requirements for storage of such wastes are met. (40 CFR 265.198) (<b>Contact ESQ Env. Compliance Specialist for assistance</b>).</p>	
		<p><b>29. Incompatible Wastes.</b> Incompatible wastes/materials are not placed in same tank system. (40 CFR 265.199)</p>	
		<p><b>30. Air Emissions.</b> If 40 CFR Part 265, Subpart AA, BB, or CC standards are applicable, tank system complies with these management standards. (40 CFR 265.202) (<b>Contact ESQ Env. Compliance Specialist for assistance</b>).</p>	
		<p><b>31. Treatment in 90-Day or Less Tanks.</b> If tanks are used to treat waste to meet RCRA Land Disposal Restrictions (LDRs), a waste analysis plan has been developed, is maintained on-site, and was submitted to EPA/state 30 days prior to treatment. (40 CFR 262.34(a)(4)) (<b>Contact ESQ Env. Compliance Specialist for assistance</b>).</p>	
		<p><b>32. State-Specific Requirements.</b> Tank system meets state-specific requirements. <b>See Project Waste Mgmt. Plan for requirements.</b></p>	
<p><b>Containment Buildings (APPLICABLE TO BULKY, NONLIQUID HAZARDOUS WASTES (e.g., lead-bearing materials from batteries) NOT AMENABLE TO ACCUMULATION, STORAGE, OR TREATMENT IN CONTAINERS OR TANKS.</b></p>			
		<p><b>33. Enclosed.</b> Building is completely enclosed (floor/walls and roof), self-supported and can support the waste and daily operating activities. (40 CFR 265.1100(a))</p>	

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<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

		<p><b>34. Barrier.</b> Building has a primary barrier that is designed to be sufficiently durable to withstand the movement of personnel and equipment. Barrier is free of significant cracks, gaps, corrosion or other deterioration that could cause release of waste. (40 CFR 265.1101(a)(4) and (c))</p>	
		<p><b>35. Compatibility.</b> Surfaces are chemically compatible with wastes that come into contact with them. (40 CFR 265.1101(a)(2))</p>	
		<p><b>36. Amount of Waste.</b> Level of waste within containment walls does not exceed height of wall. (40 CFR 265.1101(c))</p>	
		<p><b>37. Decontamination.</b> Building has decontamination area and procedures to prevent tracking waste out of building. (40 CFR 265.1101(c))</p>	
		<p><b>38. Fugitive Dust Control.</b> Fugitive dust is controlled so that openings (doors, windows, vents, cracks, etc.) exhibit no visible emissions during normal operating conditions including when vehicles enter and exit unit.</p> <p>If particulate collection devices are used (fabric filter, electrostatic precipitator) these devices are operated and maintained.</p> <p>(40 CFR 262.1101(c))</p>	
		<p><b>39. Liquids Management.</b> If containment building is used to store/treat wastes with free liquids, the following requirements are met: (40 CFR 265.1101(b))</p>	
		<p>a. <b>Primary Barrier.</b> The primary barrier is designed to prevent the migration of hazardous constituents into the barrier</p>	
		<p>b. <b>Liquid Collection/Removal.</b> Liquid collection system minimizes accumulation of liquids on primary barrier -- Primary barrier is sloped to drain liquids to collection system and liquids/waste are collected/removed to minimize hydraulic head on containment system at earliest practicable time.</p>	
		<p>c. <b>Secondary Containment.</b> The secondary containment system includes a secondary barrier designed and constructed to prevent migration of hazardous constituents into barrier and leak detection system capable of detecting failure of primary barrier and collecting accumulated wastes/liquids. <b>(Contact ESQ Env. Compliance Specialist for assistance).</b></p> <p>(Note: Leak detection system requirement is met if bottom slope is 1% or more and constructed of granular drainage material with hydraulic conductivity of <math>1 \times 10^{-2}</math> or more and 12 inches thick or constructed of synthetic/geonet drainage materials with transmissivity of <math>3 \times 10^{-5}</math> m<sup>2</sup>/sec or more)</p>	

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			<p>d. <b>Treatment.</b> If treating in building, treatment area must be designed to prevent release of liquids, wet materials, or liquid aerosols to other portions of building.</p>	
			<p>e. <b>Chemically Resistant.</b> Secondary containment system is constructed of materials that are chemically resistant to waste and liquids managed and of sufficient strength and thickness.</p>	
			<p><b>40. PE Certification.</b> On-site files contain PE Certification that containment building is designed in accordance with 40 CFR 265.1101(a) through (c). (40 CFR 265.1101(c)(2)).</p>	
			<p><b>41. Release.</b> If condition detected that could cause or has caused a release of waste, the following has been conducted: (40 CFR 265.1101(c)(3))</p>	
			<p>a. <b>Repair.</b> Condition was promptly repaired and any cleanup was conducted.</p>	
			<p>b. <b>Recordkeeping.</b> Condition/release is recorded in operating record.</p>	
			<p>c. <b>Notification.</b> Within 7 days notify EPA and within 14 working days provide written plan of steps taken to repair/cleanup.</p>	
			<p>d. <b>PE Certification.</b> After repairs performed, provide EPA with PE certification that repairs/cleanup conducted in accordance with written plan.</p>	
			<p><b>42. Inspection.</b> Building is inspected once every 7 days and results are recorded in project log book/inspection log. (40 CFR 265.1101(c)(4))</p> <p>(Inspection should include monitoring/leak detection equipment data, containment building and surrounding area for signs of release/deterioration).</p>	
			<p><b>43. Areas With and Without Secondary Containment.</b> If building contains areas with and without secondary containment:</p> <ul style="list-style-type: none"> <li>• Each area is designed and operated to meet specified requirements,</li> <li>• Measures are taken to prevent release of liquids/wet materials into areas without secondary containment; and</li> <li>• Operating log provides written description of procedures used to maintain integrity of areas without secondary containment.</li> </ul> <p>(40 CFR 265.1101 (d)).</p>	
			<p><b>44. Closure.</b> Upon leaving the project site, plans are in place to ensure storage area meets 40 CFR 265.111 decontamination/closure requirements. (40 CFR 265.179)  <b>(Contact ESQ Env. Compliance Specialist for assistance).</b></p>	

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		<p><b>45. Accumulation Time.</b> Waste is stored in building for 90 days or less, unless an extension has been obtained. Project operating record/log book documents that unit is emptied at least once every 90 days or procedures are being used to ensure waste volume remains in unit no more than 90 days. (40 CFR 262.34(a)(1))</p>	
		<p><b>46. Recordkeeping.</b> The following records are kept:</p>	
		<p>a. Procedure to ensure that each waste volume remains in the unit for no more than 90 days, <b>OR</b></p>	
		<p>b. Written description of waste generation and management practices for facility showing that they are consistent with respecting 90 day limit and documentation that procedures are complied with. (40 CFR 264.34(a)(1)).</p>	
		<p><b>47. State-Specific Requirements.</b> Containment building meets state-specific requirements. <i>(See Project Waste Mgmt. Plan for requirements).</i></p>	

**Training**

		<p><b>48. General.</b> Personnel have completed waste management training that teaches them to perform their duties (general and function specific to their tasking). Training has been conducted within 6 months after project start &amp; untrained personnel are supervised. (40 CFR 265.16(a) and (b)). This training is in addition to HAZWOPER requirements and if persons are involved with a DOT related hazardous material function, must also have DOT/HAZMAT Security training.</p>	
		<p><b>49. Annual Refresher.</b> Personnel have undergone annual waste management refresher training. (40 CFR 265.16(c)). DOT/HM Security is every 2 years <i>(Tt policy because our training includes air shipment module which is more stringent than DOT rail, highway, vessel modes).</i></p>	
		<p><b>50. Personnel Records.</b> Records are maintained on-site which include: job title of each position at facility and name of person filling it; job description of each position; written description of type/amount of training for each position; records documenting training. (40 CFR 265.16(d))</p>	
		<p><b>51. Training Records.</b> Training records are kept on-site until project closure. If employee leaves, records are kept for at least 3 years from date of last employment. (40 CFR 265.16(e))</p>	

**Preparedness and Prevention**

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<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

		<b>52. Management.</b> Project is managed to minimize the possibility of fire, explosion, or any sudden releases to the environment. (40 CFR 265.31)	
		<b>53. Testing.</b> Emergency equipment is tested/maintained to assure proper operation and records are kept of testing. (GMP; 40 CFR 265.33)	
		<b>54. Waste Handling Procedure.</b> Whenever waste is being poured, mixed, spread, or handled, all personnel have immediate access to internal alarm or emergency communication device.  When only one employee is on-site, he/she has immediate access to communication device.  (40 CFR 265.34)	
		<b>55. Local Arrangements.</b> Arrangements have been made with emergency response agencies. (40 CFR 265.37)	

**Contingency Planning (NOTE: THESE REQUIREMENTS MAY BE COVERED IN THE SITE-SPECIFIC HEALTH & SAFETY PLAN)**

		<b>56. Hazardous Waste Contingency Plan.</b> Facility has a HWCP (or SPCC Plan which has been amended to include hazardous waste requirements). The plan includes requirements specified in 40 CFR 265.52. (40 CFR 265.51 and .52) ( <b>Contact ESQ Env. Compliance Specialist for assistance</b> ).	
		<b>57. Copies.</b> HWCP is maintained at the project site and was submitted to local emergency response agencies, as appropriate. (40 CFR 265.53)	
		<b>58. Revision of HWCP.</b> HWCP is reviewed and amended immediately when: <ul style="list-style-type: none"> <li>a. regulations change,</li> <li>b. plan failed in an emergency,</li> <li>c. increased potential for emergency from changes in project/facility,</li> <li>d. list of emergency coordinators changes, and</li> <li>e. list of emergency equipment changes.</li> </ul> (40 CFR 265.54)	

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<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>
	<p><b>59. Emergency Coordinator Responsibilities.</b> On-site emergency coordinator is familiar with HWCP, operations, location/characteristics of wastes, location of records, facility layout; on-call or on-facility (or has designated alternate); is authorized to commit resources to implement HWCP. (40 CFR 265.55)</p>	
	<p><b>60. Implementation of Plan.</b> During emergency, requirements/responsibilities of emergency coordinator, implementation of plan, and notification were properly conducted. (40 CFR 265.56)</p>	
<b>Offsite Transportation/Disposal</b>		
	<p><b>61. Transporter.</b> Hazardous wastes are offered only to transporters with proper EPA Identification Numbers. (40 CFR 262.12(c))</p>	
	<p><b>62. Prequalification.</b> Hazardous wastes are transported by and disposed only by pre-approved qualified transporters and disposal, treatment or recycling facilities. (Contact Project Procurement staff or Project ESQ Env. Compliance Specialist to verify these vendors were approved prior to waste shipment). See Procedure EHS1-4.</p>	
	<p><b>63. Manifesting.</b> Completed manifests are used each time a regulated hazardous waste is transported off-site. All required data has been inputted and manifest is properly signed by both the generator &amp; transporter. (40 CFR 262.20-.23; 49 CFR 172.604)</p> <p><b>If TtEC personnel sign manifest, there is written authorization from the generator and this authorization has been reviewed by both the ESQ and Legal Departments.</b></p>	
	<p><b>64. Packaging/Labeling/Placarding.</b> Prior to off-site transport each hazardous waste is:</p> <ul style="list-style-type: none"> <li>a. Packaged &amp; labeled in accordance with DOT requirements.</li> <li>b. If 110 gallons or less, marked with commercial label designated "Hazardous Waste" and contact information</li> <li>c. Marked with generator's name, address, and manifest document number</li> <li>d. Placarded in accordance with DOT requirements.</li> </ul> <p>(40 CFR 262.30 - .32)</p>	
<p><b>Onsite Disposal</b> (If hazardous waste is being disposed at client's facility, or onsite disposal is part of remedial activity, complete the "Hazardous Waste: RCRA Permitted Facility" checklist.)</p>		

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**Recordkeeping** *Note: These are generator requirements; Tetra Tech normally is not a generator, but assists clients in managing their wastes. However, Tetra Tech may keep some or all of these records depending upon contractual requirements. It is imperative to keep records if Tetra Tech is involved in off-site transport or disposal.*

		<p><b>65. Records.</b> Records are kept on-site for at least 3 years (or in project files if project ends earlier) of the following:</p> <ul style="list-style-type: none"> <li>a. copy of generator-signed manifest</li> <li>b. copy of exception reports</li> <li>c. copy of Biennial Hazardous Waste Report (or state equivalent)</li> <li>d. records to characterize wastes.</li> </ul> <p>(40 CFR 262.40)</p>	
		<p><b>66. Biennial/State Report.</b> Biennial Haz. Waste Report has been prepared and submitted by March 1 of each even numbered year or according to timing and schedule of state requirement. (40 CFR 262.41)</p> <p><i>Note: Determine what Tetra Tech scope of work is. At a minimum, Tetra Tech should provide client with notice that Biennial Report is required.</i></p>	
		<p><b>67. Exception Reports.</b> If copy of signed manifest from TSDf is not received within 35 days from off-site transport, transporter was contacted. If the manifest was not received within 45 days, an Exception Report was submitted to the EPA (or State). (40 CFR 262.43)</p>	
		<p><b>68. LDR Certification/Notices/Waste Analysis.</b> Copies of all data to support characterization (either based upon knowledge of waste or testing), notices, certifications, demonstrations are kept on-site/in project files for at least 5 years. (40 CFR 268.7(a)(5))</p>	

**Land Disposal Restrictions**

		<p><b>69. Notice/Certification.</b> LDR Notification forms are submitted with the first off-site shipment of each particular RCRA hazardous waste to a TSDf, <b>OR</b> generator has provided Certification form that waste is not prohibited from land disposal and waste meets LDR treatment standards. (40 CFR 268.7(a))</p>	
		<p><b>70. Exemption.</b> If waste is determined to be exempt from RCRA Subtitle C subsequent to the point of generation, a one-time notice stating this determination is placed in the project files. (40 CFR 268.7(a)(6))</p>	

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	<p><b>71. Debris. (Note: Contact Project Env. Compliance Specialist for assistance). (40 CFR 268)</b></p> <p>Debris which contains a listed haz. waste (i.e., F, K, P or U codes) or exhibits a characteristic (i.e., D001-D043 codes) has:</p> <ul style="list-style-type: none"> <li>a. Obtained a "contained-in" determination by EPA;</li> <li>b. Has been treated and meets the LDR Debris performance standards and therefore is no longer regulated as hazardous; OR</li> <li>c. Meets the LDR standards and applicable Universal Treatment Standards.</li> </ul> <p>(Residues from treatment of hazardous debris must be managed as a hazardous waste and meet 40 CFR 268 standards prior to land disposal.)</p>	
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--End of Checklist--

EHS 3-3 ATTACHMENT C

TETRA TECH EC, INC.

PESM INSPECTION CHECKLIST— LEAD-BASED PAINT ABATEMENT/ASSESSMENT/SAMPLING

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	

This checklist applies to projects where lead-based paint abatement, assessment, or sampling is being conducted

General Requirements		
		<p><b>1. Scope of Activities.</b> Project involves the following activities. Please circle those that are applicable.</p> <ul style="list-style-type: none"> <li>a. Assessment</li> <li>b. Sampling</li> <li>c. Abatement</li> <li>d. Other: _____</li> </ul>
		<p><b>2. Certifications.</b> Check on that the following certifications are in order:</p> <p><b>Training Programs:</b> Contractor(s) who performs lead-based paint abatement, assessment, sampling, etc., has been trained under a current certification program that took effect on 6/23/2008.</p> <p><b>Firms:</b> Ensure that the contractor firm has applied for certification on or after 10/23/2009. [Note: On or after April 22, 2010, no firm may perform, offer, or claim to perform renovations without certification from EPA under §745.89 in target housing or child-occupied facilities.]</p> <p><b>Individuals:</b> Ensure that on or after 4/22/2010, all renovations are directed by renovators certified in accordance with §745.90(a) and performed by certified renovators or individuals trained in accordance with §745.90(b)(2) in target housing or child-occupied facilities.</p> <p><b>Note:</b> There are some exceptions to the above. Check with ESQ if any of the certifications are lacking.</p>
		<p><b>3. Permits.</b> Notification submitted or permit issued prior to commencement of lead-based paint abatement, assessment, sampling, etc., activities. Verify that permits have been obtained and that project is operating in compliance with the terms/conditions of such permits. (State/local regulations)</p> <p><b>Note:</b> On or after April 22, 2010, all renovations must be performed in accordance with the work practice standards in §745.85 and the associated recordkeeping requirements in §745.86(b)(6) and (b)(7) in target housing or child-occupied facilities.</p>

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Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	

		<p><b>4. Cleanup Standards.</b> Ensure that project is complying with federal/state cleanup requirements. (Federal/State/local regulations)</p> <p><b>Note:</b> Federal clearance levels are found in §745.227.</p>	
		<p><b>5. Record-keeping.</b> Ensure that all records and certifications pertaining to the renovation or remediation are being retained for a period of three years following completion of the renovation. Specific record-keeping requirements are listed in §745.86</p>	
		<p><b>6. OSHA.</b> OSHA specifies requirements for workers conducting lead-abatement activities. Review SHSP implementation requirements. Discuss with ESS how requirements are being met at the Site.</p>	

<b>Waste Generation/Management/Disposal</b> (If hazardous wastes are being generated, also refer to Hazardous Waste: Storage Treatment Disposal in Less than 90 days Checklist)			
		<p><b>7. Recognized Test Kits.</b> Ensure that only EPA recognized test kits for lead are being used at the project site.</p> <p><b>Note:</b> This regulation took effective June 23, 2008.</p>	

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TETRA TECH EC, INC.

PESM INSPECTION CHECKLIST— LEAD-BASED PAINT ABATEMENT/ASSESSMENT/SAMPLING

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	

		<p><b>8. Waste Characterization.</b> Waste has been characterized in accordance with hazardous or special waste requirements. EPA suggests the use of the guidance, "Applicability of RCRA Disposal Requirements to Lead-Based Paint Abatement Wastes," (EPA 747-R-93-0006). The following are EPA's recommendations for characterizing various waste streams. State and local regulations also need to be evaluated. All items must either be tested to determine if they are hazardous or generator knowledge must be used to characterize.</p> <ul style="list-style-type: none"> <li>a. <b>Bulk Items (Wood, Plaster, Doors, etc.).</b> Generally hazardous when the lead level in the paint exceeded 4 mg/cm<sup>2</sup>. This threshold is not EPA policy.</li> <li>b. <b>Paint Chips/Dust/Debris.</b> May be hazardous or non-hazardous.</li> <li>c. <b>HEPA Filters/ HEPA Vacuum Debris.</b> May be hazardous or non-hazardous.</li> <li>d. <b>Stripping Sludge/Unfiltered Liquid Waste.</b> May be hazardous or non-hazardous.</li> <li>e. <b>Disposable Work Clothes.</b> Generally considered non-hazardous.</li> <li>f. <b>Respirator Filters.</b> Generally considered non-hazardous.</li> <li>g. <b>Filtered Wash-water.</b> Generally considered non-hazardous.</li> <li>h. <b>Plastic Sheeting and Tape.</b> Generally considered non-hazardous, unless a heat gun is used for paint removal or if enclosure or encapsulation abatement methods are used.</li> </ul>	
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--End of Checklist--

**EHS 3-3 ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST - OIL AND HAZARDOUS SUBSTANCES MANAGEMENT**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

*This checklist applies when petroleum, oil, or hazardous substances are stored, used, or handled on the project site or transported on- or off-site.*

<b>General Requirements</b>		
		<p><b>1. Oil/Water Separators.</b> Project involves the maintenance/pumping/ inspection of oil water separators. Proper waste management procedures are being implemented depending upon final disposition of pumped out product, sludges, etc. <i>Complete applicable EHS 3-3 Solid or Hazardous Waste Checklists.</i></p>
		<p><b>2. State Regulations.</b> State/local regulations specify requirements for oil storage, handling or disposal which are more stringent than requirements specified in this checklist. <i>Check the Site Health and Safety Plan to determine if State/local regulations are applicable.</i></p>
		<p><b>3. Fire Marshall Approval.</b> Project involves aboveground storage of oil (or other hazardous substance). State/local fire department may require approval of the design, location, handling procedures, etc. for oil storage. Check the Site Health and Safety Plan to see if these criteria have been met.</p>
		<p><b>4. Uniform Fire Code Requirements.</b> Storage of hazardous materials in certain amounts must comply with UFC requirements which include: permitting, incompatibility, posting, security, construction/maintenance requirements for tanks, containers, cylinders, pipe/valve/fittings criteria, placard, plan requirements, drainage, secondary containment, ventilation, etc. Specific requirements apply to storage/handling/use of oxidizers, reactive/water-reactive materials, cryogenic, highly toxic and toxic materials, corrosives, carcinogens, irritants, sensitizers, radioactive materials, organic peroxides, toxic and highly toxic compressed gases, and flammable solids/gases/liquids. The local fire department has informed project how to comply with these requirements. ESS has documented in project file any local requirements and requirements are being met.</p>
		<p><b>5. Oil Product Handling/Disposition.</b> Project involves the storage/disposition of oil product. The method by which the oil will be dispositioned will dictate the management/disposal requirements. <i>Complete waste checklists as appropriate. For example, the "Hazardous Waste Storage, Treatment and/or Disposal in Less than 90 Day Checklist", or the "Solid Waste Checklist."</i></p>

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Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

**Spill Prevention Control and Countermeasure Plan (SPCC Plan)** *Applies when oil is stored, transported or handled in the following quantities: Total aboveground storage is 1,320 gallons or more. Since requirement applies to "facilities," discuss with client the quantities of oil stored at its facility to ensure total "facility" volumes (including project site) are properly calculated. NOTE: The December 2008 Amendments have streamlined requirements for some facilities, however the effective date has been delayed – check with ESQ Dept. to find out current date. See Zip Bulletin 260 or check with ESQ Environmental Compliance Specialist for assistance. (Note: Requirements regulating completely buried tanks (which are already subject to all UST requirements) have been vacated.)*

			<p><b>6. Development.</b> SPCC plan has been developed and project was constructed and is operating in compliance with its requirements. (40 CFR 112)</p>	
			<p><b>7. Contents.</b> SPCC plan states that it meets all plan requirements as stated in 40 CFR 112.</p>	
			<p><b>8. Certification.</b> Plan has been certified by a PE and contains appropriate management approvals, unless it meets the conditions for "self certification." (40 CFR 112.7); <i>See ZIP Bulletin 260</i></p>	
			<p><b>9. Project Drainage.</b> Facility drainage meets the following standards:</p> <ul style="list-style-type: none"> <li>a. For diked storage areas, drainage is restricted by valves, which are preferably manual open/close variety, and pumps/ejectors are manually activated and inspected.</li> <li>b. Undiked areas drain into ponds, lagoons or catchments basins which are designed not to flood.</li> <li>c. If treatment units are used, drainage is designed to gravity flow or flow into back-up pumping systems.</li> <li>d. Drainage is engineered to prevent oil from reaching navigable waters.</li> </ul> <p>(40 CFR 112.7(e)(1))</p>	
			<p><b>10. Containment/Diversionary Structures.</b> Appropriate containment/ diversionary structures are at project site which may include: dikes, berms, retaining walls, curbing, culverts, gutters, drainage systems, weirs, booms, other barriers, spill diversion ponds, retention ponds, and sorbent materials. (40 CFR 112.7(c)).</p>	
			<p><b>11. Spill Control/Cleanup Equipment.</b> Spill control materials are located on project site and may include: sorbent materials, oil retention booms, sand bags/temporary curbing devices, fuel recovery pumps/collection hoses, fuel recovery tank trucks, and protection equipment for project staff. (40 CFR 112.7(c))</p>	
			<p><b>12. Drainage Water Quality.</b> Discuss spill history with ESS and determine if any oil spills to containment systems/drainage areas/anywhere on project site have occurred? Determine if procedures followed were in compliance with SPCC Plan and TtEC requirements.</p>	

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		<p><b>13. On-shore Bulk Storage.</b> Bulk storage tank system complies with standards which include tank structure compatibility, secondary containment/alternative drainage, specific drainage requirements, periodic testing/inspections, tanks alarms, pumps and level sensors. (40 CFR 112.7(e)(2)) <i>Note: Check regional EPA definition of "bulk" storage which normally includes any aboveground storage greater than 12,000 gallons.</i></p>	
		<p><b>14. Testing.</b> Periodic integrity testing (including tanks supports/foundations/ internal heating systems, etc.) is being conducted. In addition, piping systems are pressure tested once per year. Project files document testing results. (40 CFR 112.7(e)(2) and (3))</p>	

		<p><b>15. Loading/Unloading.</b> Loading and unloading procedures meet DOT requirements; project personnel are in continuous attendance during loading/unloading; if no catchment basin, quick drainage system is used, and lower most drain and all outlets are inspected for leaks after tank filling. (40 CFR 112.7(e)(8))</p>	
		<p><b>16. Security.</b> Appropriate security is maintained at project site. (40 CFR 112.7(e)(9))</p>	
		<p><b>17. Recordkeeping.</b> The following records are maintained:</p> <ul style="list-style-type: none"> <li>a. Copy of SPCC plan is kept at project site if it is normally attended more than 8 hours per day; otherwise it is kept at the nearest field office.</li> <li>b. Inspection records are kept for at least 3 years, including: written inspection procedures, inspections which are signed and dated by inspector, and notes describing repairs.</li> </ul> <p>(GMP; 40 CFR 112.7(e)(8))</p>	
		<p><b>18. Amendments.</b> Material change in project design, construction, operation, or maintenance that alters potential for oil spill has occurred and the SPCC Plan has been amended. (40 CFR 112.5)</p>	
		<p><b>19. Review.</b> SPCC Plan has been reviewed within last 5 years. If revisions were required, such revisions were made within 6 months of review. (40 CFR 112.5).</p>	
		<p><b>20. Designated Project Staff.</b> A designated person is responsible for overall spill prevention. This person conducts workplace safety evaluations and inspections. (40 CFR 112.7(e)(10))</p>	

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<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

		<p><b>21. Release.</b> Has more than 1,000 gallons spilled in a single incident or "harmful quantity" been discharged in 2 incidents within 12 months? Reporting to EPA/state has been conducted. (40 CFR 112.4) <i>Note: In addition, CWA requires immediate notification/written notification for releases to waters of the US that causes a sheen. Notifications are made to the National Response Center Hotline (800-424-8802) and the State's Spill Hotline.</i></p>	
		<p><b>22. Training.</b> Project staff involved with management/handling of oil take part in periodic training in spill prevention/response. (40 CFR 112.7(e)(10))</p>	
		<p><b>23. Inspections.</b> Inspections are conducted daily in accordance with SPCC plan.</p>	
		<p><b>24. Release of Accumulated Containment Liquids.</b> Confirm with ESS procedures for releasing accumulated storm water from secondary containment surrounding tank. Is it documented on daily inspection documentation?</p> <ul style="list-style-type: none"> <li>a. Water is inspected for visible signs of contamination prior to release</li> <li>b. Water is removed daily, or as necessary to prevent excessive accumulation</li> </ul>	
<p><b>Facility Response Plan</b> (<i>Applies if storage of greater than 1 million gallons of oil and certain location criteria/lack of secondary containment exists or involves transfer of oil over water from vessel to vessel.</i>) For example, oil refineries and terminals.</p>			
		<p><b>25. Develop/Submit Facility Response Plan.</b> Facility response plan was developed in accordance with 40 CFR 112.20 and <b>submitted</b> to EPA in a timely manner for the project activities. (40 CFR 112.20)</p>	
		<p><b>26. No Substantial Harm.</b> Project meets criteria of storage capacity/location but has requested an exemption because it believes "no substantial harm" will occur. (40 CFR 112.20(e))</p>	

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Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

**Hazardous Materials Storage** *(Applies to storage of virgin hazardous materials, not hazardous and non-hazardous wastes)*

		<p><b>27. OSHA Hazardous Communication.</b> Health and Safety Inspection has been conducted which addressed OSHA Hazardous Communication requirements. (29 CFR 1910.1200)</p>	
		<p><b>28. Hazardous Chemical Inventory Reporting.</b> (EPCRA Section 312) Project site handles/stores:</p> <ul style="list-style-type: none"> <li>a. 10,000 pounds or more of a hazardous chemical; OR</li> <li>b. 500 pounds or the threshold planning quantity (TPQ) (whichever is less) of an extremely hazardous substance (EHS);</li> <li>c. Then project must submit a list of hazardous substances/copies of MSDS to state commission, local committee, and local fire department.</li> </ul> <p>(40 CFR 370)</p>	
		<p><b>29. Toxic Chemical Release Reporting.</b> (EPCRA Section 313) Project involves work at a facility that manufactures or processes 25,000 pounds of a toxic chemical or uses 10,000 pounds of a toxic chemical, the client's facility is SIC code 20 - 39, AND it employs more 10 or more full-time employees. A Toxic Chemical Inventory Release Report must be submitted by March 1 of each year. (40 CFR 372) <i>Note: Site often only provides information to client for their reporting purposes. If Section 313 reporting is applicable, ensure project files reflect actions taken.</i></p>	
		<p><b>30. Emergency Planning and Response.</b> (EPCRA Section 301-303).Project stores extremely hazardous substances on-site above TPQ. State commission was notified within 60 days of commencing on-site work. The information provided to commission is up-to-date. (40 CFR 355.30) <i>Note: OSHA also has emergency planning requirements which should have been addressed in H&amp;S inspection.</i></p>	
		<p><b>31. Release.</b> (EPCRA 304) Has a release of a hazardous substance occurred on the project site? If so, was the National Response Center and state/local agencies contacted verbally and in writing as required? (40 CFR 302 and 355, state/local regulations)</p>	

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Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

**Hazardous Materials Transportation** (This section applies if DOT "hazardous materials", which may include hazardous wastes, are being transported on "public roads." Requirements are GMP for transport on private/in-facility roads.)

	<b>32. Shipping Papers/Manifests.</b> Discuss procedures for receipt and review of shipping papers with ESS. Ensure shipping papers are completed, reviewed, and approved by Tetra Tech EC personnel/client for shipment of samples, project-specific chemicals, etc	
	<b>33. Packaging/Labeling/Marking.</b> Based upon the classification of the hazardous material, the proper DOT packaging/labeling/markings is being chosen and the materials are being packaged by an employee/subcontractor who has been properly DOT trained. (40 CFR 172)	
	<b>34. Training.</b> Tetra Tech EC employees/subcontractor employees performing DOT functions have been trained at least every 3 years. (Bi-annually for IATA Shipments). Documentation of training is located at the project site. (40 CFR 172, Subpart G)	
	<b>35. Placarding.</b> Placards are being offered to transporter prior to shipment offsite. (40 CFR 172.500)	
	<b>36. Transportation in Tetra Tech EC Vehicle.</b> Project involves the transportation of hazardous materials (e.g., samples, supplies) on public roads in company vehicles. TTEC Shipping Paper was used to transport hazardous materials. Packaging, labeling, and training requirements also being complied with. <i>Note: Materials of Trade Exemption may apply.</i>	
	<b>37. International Shipments.</b> Project involves shipment of hazardous materials across international boundaries or through international waters. Shipment complied with International and/or other foreign country transportation and environmental requirements.	
	<b>38. Prequalification.</b> Review transporters used at project site and ensure all were pre-qualified prior to use. (See EHS 1-4)	

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<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

	<p><b>39. DOT HM Security Plan.</b> Project is required to have an HM Security Plan if project ships hazardous waste or hazardous materials in bulk containers having any of the following <u>capacities</u>:</p> <ul style="list-style-type: none"> <li>• 17.3 cubic yards for solids (Ex.: 20 cubic yard capacity roll-off container, end dump, dump truck, etc.); or</li> <li>• 3,500 gallons for liquids (Ex.: 5,000 gallon capacity tanker truck); or</li> <li>• Shipment is required by DOT regulations to be placarded (Ex.: More than 1,000 pounds of HM, except for Class 9).</li> </ul> <p>(49 CFR 172 Subpart 800)</p>	
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--End of Checklist--

ATTACHMENT C  
TETRA TECH EC, INC.  
PESM INSPECTION CHECKLIST— POLYCHLORINATED BIPHENYLS

CONFIDENTIAL

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES

*This checklist applies if project involves the management, generation or disposal of PCBs 50 ppm or greater (this includes PCB containing electrical equipment/transformers, PCB liquids, soils/rags from cleanup of 50 ppm PCB spill, and containers storing such materials). Exemptions as outlined in this checklist may apply for management/cleanup of PCBs conducted under CERCLA and spills which occurred prior to 1978 when the anti-dilution provisions of TSCA became effective. This checklist does not address state-specific requirements for PCBs less than 50 ppm. State regulations must be consulted for those requirements.*

General Requirements		
		1. <b>PCBs 50 ppm or greater.</b> Liquid, transformer, capacitor, rags, debris, soil or other article/environmental media have been determined to contain PCBs at concentration 50 ppm or greater. (40 CFR 761.1(a))
		2. <b>PCBs Resulting from Spill/Concentration Less than 50 ppm.</b> Determination has been made that materials/environmental media contaminated by PCBs resulted from a spill that occurred after 1978 and the material spilled contained 50 ppm or greater PCBs. (40 CFR 761.1(a))
		3. <b>PCBs Resulting from Spill/CERCLA Activity.</b> Project is being conducted under CERCLA/IRP and a determination has been made that materials/environmental media contains 50 ppm or greater PCBs. (EPA Superfund Guidance – PB90-274432 and OSWER 9355.4-01)
		4. <b>Awaiting Analytical.</b> PCB wastes are being stored awaiting analytical regarding PCB concentration.
<b>Storage 30 Days or Less (Applies if PCBs are stored at project site for 30 days or less.)</b>		
<i>Note: See General Requirements for additional requirements applicable to less than 30-day storage areas.</i>		
		5. <b>Designated Area.</b> A designated area has been established for accumulation of PCB wastes. (GMP)
		6. <b>Accumulation Time.</b> Waste tracking log shows PCB wastes are stored in designated area for 30 days or less. (40 CFR 761.65(c)(1))
		7. <b>PCB Article/Type of Wastes.</b> Only the following PCB wastes are stored:
		a. Non-leaking PCB articles/PCB equipment.
		b. Leaking PCB articles/equipment if placed in non-leaking container with sufficient absorbent.
		c. PCB Containers containing non-liquid PCBs (soil/rags/debris).
		d. Liquid PCBs between 50 and 500 ppm stored in containers. A Spill Prevention Control and Countermeasure Plan has been prepared in accordance with 40 CFR 112 and each container bears notation that liquids in drums do not exceed 500 ppm PCBs. (40 CFR 761.1.65(c)(1))

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	e. Non-leaking/structurally undamaged PCB Large High Voltage Capacitors/PCB-Contaminated Electrical Equipment that have not been drained of free-flowing fluid are stored on pallets next to greater than 30 day storage facility and storage area has immediately available unfilled storage space to 10 percent of volume of capacitors/equipment stored outside. (40 CFR 761.65(c)(1))	
<b>1-Year Storage Facility</b> ( <i>Applies if PCBs are stored at project site for less than 1 year, but greater than 30 days</i> ) <i>Note: See General Storage Requirements for additional requirements applicable to greater than 30-days, but less than 1-year storage areas.</i>		
	<b>8. Accumulation Time.</b> Waste tracking log indicates PCB wastes are disposed of within 1 year of being placed into storage.	
	<b>9. Roof and Walls.</b> Storage facility has adequate roof and walls to prevent rain water from reaching PCBs and PCB Items. (40 CFR 761.65(b))	
	<b>10. Curbing.</b> Floor has continuous curbing with minimum six inch high curb.	
	<b>11. Containment.</b> Floor/curbing have containment volume equal to at least two times the internal volume of the largest PCB Article/PCB Container stored therein or 25% of all PCB Articles/Containers, whichever is greater.	
	<b>12. Impervious Material.</b> Floor/curbing are constructed of continuous smooth and impervious materials to prevent/minimize penetration of PCBs.	
	<b>13. Floodplain.</b> The facility is not located at a site that is below the 100-year flood water elevation.	
<b>General Storage Requirements</b> ( <i>Applies to storage of PCBs in both: 1) Less than 30-day and 2) Greater than/equal to 30 days, but less than 1-year storage areas</i> )		
	<b>14. Marking Storage Area.</b> Storage area is clearly marked with "Caution-PCB" sign. (40 CFR 761.40(a)(10))	
	<b>15. Marking Containers.</b> PCB Containers/Article Containers are clearly marked with "Caution-PCB" mark and Out of Service Date (i.e., the date the item was removed from service or waste was generated) is clearly visible. (40 CFR 761.40(a) and 761.65(c)(1))	
	<b>16. Management.</b> Storage area is managed so that PCB Articles/Containers can be located by date they entered storage.	

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	<b>17. Decontamination of Equipment.</b> Movable equipment used to handle PCBs/PCB Items in storage facility that comes in direct contact with PCBs has been decontaminated by swabbing surfaces contacted with PCBs with a solvent that contains less than 50 ppm PCBs/solubility 5 percent or more by weight prior to removal from area. (40 CFR 761.65(c)(4) and 761.79)	
	<b>18. Inspection.</b> All PCB Articles/Containers are checked for leaks at least once every 30 days. Inspection forms are maintained in on-site project files. (40 CFR 761.65(c)(5))	
	<b>19. Leaking Articles/Containers.</b> Leaking PCB Articles and PCB Containers and contents are transferred immediately to properly marked non-leaking containers. Spilled material is cleaned up immediately and PCB-contaminated material is disposed in incinerator or chemical waste landfill. (40 CFR 761.65(c)(5) and 761.60(a)(4))	
	<b>20. Container Requirements.</b> PCBs are contained in DOT Specification Containers. (49 CFR 172.101, GMP)	
	<b>21. One-Year Disposal Requirement.</b> PCB Articles/Containers are removed from storage and disposed of within one year from the date when they were first placed in storage. (40 CFR 761.65(a))	
<b>PCB Stockpile Storage</b> ( <i>Applies to soils and other solid PCB wastes stored in stockpiles</i> )		
	<b>22. Accumulation Time.</b> Waste tracking log indicates PCB waste stockpiles are stored less than 180 days.	
	<b>23. Type of Wastes.</b> Only solid, non-flowing PCB solids may be stored in stockpiles.	
	<b>24. Containment.</b> The stockpile is covered when not in use to control dispersal by wind or water. Water is not used to prevent wind dispersal.	
	<b>25. Leachate.</b> No leachate is generated as a result of storage in the stockpile	
	<b>26. Liner.</b> Stockpiled waste is placed on a liner that prevents PCBs from migrating into soil or groundwater.	
	<b>27. Storm Water Protection.</b> Adequate run-on controls are present to withstand a 25 year storm event. Water ??	
<b>Decontamination</b>		
	<b>28. Container Decontamination.</b> PCB containers are decontaminated by 1) flushing internal surface of container at least 3 times with a solvent that contains less than 50 ppm PCBs/solubility 5 percent or more by weight prior to removal from area; 2) each rinse is at least 10 percent of the container's volume; and 3) rinse/solvent/residue is disposed of in accordance with 40 CFR 761.60. (40 CFR 761.79)	

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			<p><b>29. Staging Area.</b> Decontamination is conducted in engineered staging area where all rinsates/solvents/residues are collected in a sump or other containment system.</p>	
<b>Disposal</b>				
			<p><b>30. All PCBs.</b> PCB-contaminated items, and materials are disposed of in an EPA-approved incinerator, high efficiency boiler, or chemical waste landfill, as required under 40 CFR 761.60.</p>	
<p><b>PCB Spill Cleanup Policy</b> (<i>Applies if PCB from current or recent spill is being cleaned up (e.g., contaminated soil, concrete pads, buildings, containers, etc.)</i>)</p>				
			<p><b>31. Historical Spills.</b> If spill occurred prior to May 4, 1987, it is a historical spill and cleanup is complying with case-by-case cleanup criteria established by EPA. Project files contain documentation outlining the cleanup criteria. (40 CFR 761.120(a)(1))</p>	
			<p><b>32. Current Spills.</b> If spill occurred after May 4, 1987 (except those specified in 3 below), it is a current spill and is meeting the requirements of 40 CFR 761.125(a) and (b), unless EPA has specified more/less stringent cleanup criteria. (40 CFR 761.120(a)(3), (b), and (c))</p>	
			<p><b>33. Notification/Recordkeeping.</b> EPA was notified as soon as possible (no later than 24 hours) if the spill directly contaminated surface water, sewer, drinking water, grazing lands, or exceeded 10 pounds. National Response Center was also contacted if spill exceeded 1 pound. Cleanup was begun immediately in accordance with the PCB Spill Cleanup Policy. (40 CFR 761.125)</p>	
			<p><b>34. Recordkeeping.</b> Records and certifications specified in 40 CFR 761.125(a) are maintained in the project files. Records of spill/decontamination procedure were developed and are being maintained in project files. (40 CFR 761.125(a) and (b)(5))</p>	
<p><b>Recordkeeping Note:</b> <i>These are generator requirements; Tetra Tech EC normally is not a generator, but assists clients in managing their wastes. However, Tetra Tech EC may keep some or all of these records depending upon contractual requirements. It is GMP to keep records if Tetra Tech EC is involved in off-site transport or disposal. Confirm that ESS understands and has documented who's responsibility it is to maintain documentation.</i></p>				
			<p><b>35. Records. Project files contain the following records:</b></p> <ul style="list-style-type: none"> <li>a. Written annual document log regarding disposition of each PCB item prepared by July 1 for the previous year,</li> <li>b. Signed manifests; and</li> <li>c. Certificates of Disposal (40 CFR 761.180(a)).</li> </ul> <p>These records are kept for at least 3 years after project stops storing PCBs.</p>	

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<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>
	<p><b>36. Exception Reports.</b> If copy of signed manifest from disposer is not received within 35 days from off-site transport, transporter was contacted. If the manifest was not received within 45 days, exception report was filed with EPA. (40 CFR 761.215)</p>	
	<p><b>37. One-Year Exception Report.</b> If waste is transferred to disposer within 9 months of date of removal from service and generator has not received within 13 months a Certificate of Disposal or the Certificate of Disposal confirms waste was disposed of more than 1 year after the date of removal from service, a one-year exception report was filed with EPA. (40 CFR 761.215)</p>	
	<p><b>38. Cleanup/Decontamination Report.</b> If project involves cleanup of a current spill, record/certification of cleanup/decontamination is being maintained for 5 years. (40 CFR 761.125(b)(3) and (c)(5))</p>	
<b>Off-Site Transportation/Disposal</b>		
	<p><b>39. EPA Notification Number.</b> If the project involves storage of PCBs for more than 30 days or storage of bulk liquid PCBs in large non-DOT containers, the client has obtained an EPA Notification number. (40 CFR 761.202 and .205) <i>Note: Generators who do not store PCBs for greater than 30 days may use either their EPA Identification number under RCRA or the generic number "40 CFR Part 761".</i></p>	
	<p><b>40. Transporter/Disposer.</b> Transporters and disposers used for the project PCB wastes have EPA Notification numbers. (40 CFR 761.202(b))</p>	
	<p><b>41. Manifesting.</b> Completed hazardous waste manifests are used each time a PCB waste is transported off-site. The following information is included based upon the type of PCB waste. (40 CFR 761.207)</p> <ul style="list-style-type: none"> <li>a. Bulk PCBs: identify waste, date of removal from service (Out of Service Date), and weight of PCBs.</li> <li>b. PCB Article Container/Container: unique identifying number; type of waste, date of removal from service, and weight.</li> <li>c. PCB Article not in Container: serial number/identification; date of removal from service, and weight of PCB waste in the article.</li> </ul>	
	<p><b>42. Certificate of Disposal.</b> Certificate of Disposal was received by generator within 30 days of the date that PCB waste was disposed of.</p>	

--End of Checklist--

ATTACHMENT C  
TETRA TECH EC, INC.  
PESM INSPECTION CHECKLIST— NON-HAZARDOUS IDW/SOLID WASTE

CONFIDENTIAL

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES

*This checklist applies when project generates, manages, transports, or disposes of solid waste (except hazardous waste or TSCA-regulated PCB waste), including Investigation Derived Waste, special waste, unexploded/explored ordnance, chemical warfare agents, and used oil.*

<b>General Requirements</b>											
		<p><b>1. Waste Determination.</b> Waste has been characterized. (State/local regulations, TTEC Environmental Field Procedures)</p>									
		<p><b>2. Waiting Analytical.</b> Wastes being stored awaiting waste determination.</p>									
<b>Investigation Derived Waste</b>											
		<p><b>3. WMP Plan.</b> A Waste Management (WMP) Plan has been developed which identifies how IDW and other solid waste is to be characterized, managed and disposed of based upon suspected/ known contamination. IDW Plan requirements are being fully complied with. (GMP; CERCLA guidance). Circle which types of IDW are being generated.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Soil cuttings</td> <td style="width: 33%;">Treatment residues</td> <td style="width: 33%;">Disposable Sampling Equipment</td> </tr> <tr> <td>Purge water</td> <td>Deconwater</td> <td>PPE</td> </tr> <tr> <td colspan="3">Other: _____</td> </tr> </table>	Soil cuttings	Treatment residues	Disposable Sampling Equipment	Purge water	Deconwater	PPE	Other: _____		
Soil cuttings	Treatment residues	Disposable Sampling Equipment									
Purge water	Deconwater	PPE									
Other: _____											
		<p><b>4. Suspected Hazardous Waste.</b> IDW, which is suspected of being hazardous is containerized and managed as hazardous waste until proven otherwise. (Note: If hazardous, refer to Hazardous Waste checklist for requirements. This checklist is not required.)</p>									
		<p><b>5. Container/Stockpile Labeling.</b> Drums awaiting analytical results are labeled with "source/location of contents"; "contents/quantity"; "date of sampling"; "Analysis Pending", and any other requirement identified in the (WMP) Plan. If contents of drum are known, it is labeled in accordance with regulatory requirements.</p>									
		<p><b>6. Containers are being managed in accordance with BMPs. (containers closed, inspected, tracked)</b></p>									
<p><b>Special Waste/Solid Waste</b> (<i>Special Waste may include petroleum-contaminated waste, soils that exceed state/federal cleanup levels but are not hazardous, PCB wastes not regulated under TSCA, etc. Solid waste may include construction debris, demolition debris, decontamination wastewater, non-hazardous soil, scrap metal, etc. Check state/local regulations for definitions.</i>)</p>											
		<p><b>7. Stockpiles.</b> Waste is being stored in stockpiles in compliance with liner, size, covering, etc. requirements. (State/local regulations)</p>									

ATTACHMENT C  
TETRA TECH EC, INC.  
PESM INSPECTION CHECKLIST— NON-HAZARDOUS IDW/SOLID WASTE

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	
	<p><b>8. Container Management.</b> Waste is being stored in containers that meet condition, compatibility, closure/covering, and marking/labeling requirements. Containers are handled so as to prevent rupture/leaking. ESS demonstrates appropriate understanding of proper storage and handling.</p>		
	<p><b>9. Labeling.</b> Waste is labeled in accordance with the WMP. ESS understands WMP requirements for labeling.</p>		
	<p><b>10. Inspections.</b> Documented inspections are in maintained in the project files. If no regulatory requirements exist, waste and accumulation areas are inspected at least weekly. ESS demonstrates understanding of good container management procedures:</p> <ul style="list-style-type: none"> <li>a. containers kept closed, except when adding/removing wastes,</li> <li>b. containers handled/stored to prevent leaking/rupturing and allow for inspection,</li> <li>c. accumulation/storage areas are kept free of precipitation, debris, etc.</li> </ul>		
	<p><b>11. Drum/Waste Logs.</b> Drum/Waste logs are reviewed and were noted to be up-to-date.</p>		
	<p><b>12. Treatment.</b> Waste is being treated on-site. Regulations may require that a treatment plan be submitted for approval from the regulatory agency, permit be obtained, specified treatment goals be met, records be kept, reports submitted, etc. <i>Note: Complete "Air Quality" and "Wastewater/Stormwater Discharges/UIC" checklists, if applicable. (State/local regulations)</i></p>		
	<p><b>13. Accumulation Time.</b> Waste is moved off-site within time-period required by regulation (if applicable) or, if available, an extension is obtained from the regulatory agency. Extension documentation is maintained in project files. (State/local regulations)</p>		
	<p><b>14. On-Site Disposal.</b> Waste is being disposed of on-site in accordance with state/local regulations. Permit, if required, has been obtained and project activities are in compliance with its terms/conditions. (State/local regulations)</p>		
	<p><b>15. Transportation.</b> Transportation of waste complies with state/local solid waste and transportation requirements. Transportation vehicles are inspected in accordance with regulatory requirements. <i>Note: If hazardous materials being transported off-site, complete "Oil and Hazardous Substance Management" checklist.</i></p>		
	<p><b>16. Off-Site Disposal.</b> Off-site landfills which receives waste is pre-qualified under TTEC procedures. (State/local regulations)</p>		

ATTACHMENT C  
TETRA TECH EC, INC.  
PESM INSPECTION CHECKLIST— NON-HAZARDOUS IDW/SOLID WASTE

CONFIDENTIAL

Project:	Inspector:	Date:
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

			<b>17. Recordkeeping.</b> All required records are maintained in project files. These records may include inspection logs, sampling results, off-site disposal manifests/trip-tickets, agency correspondence, etc. (State/local regulations)	
			<b>18. State-Specific Requirements.</b> Waste management, transportation and disposal comply with other state/local regulatory requirements. (See WMP for state requirements)	

**Medical/Infectious Wastes** *Note: Compliance with 40 CFR 259 has been vacated by EPA. Medical/infectious waste is primarily regulated by states. Refer to WMP to determine if plan requirements are being followed for medical/infectious waste. The checklist items below are common to many state requirements and are considered BMPs. Note: DOT often regulates medical/infectious waste as a class 6.2 hazardous material due to potential for disease transmission.*

			<b>19. WMP.</b> WMP addresses medical/infectious waste management. ESS understands medical waste management requirements including transportation requirements.	
			<b>20. Segregation.</b> Medical/infectious wastes are segregated.	
			<b>21. Packaging.</b> Medical/infectious waste is packaged in accordance with regulatory requirements which may include using rigid, leak-resistant packaging that is impervious to moisture, sufficiently strong to prevent tearing, and sealed to prevent leakage.	
			<b>22. Storage.</b> Medical /infectious waste is stored in a secure, protected area in a way that maintains integrity of packaging. Waste is maintained in a nonputrescent state.	
			<b>23. Labeling.</b> Untreated medical waste is affixed with label "Medical Waste" or "Infectious Waste" or "Biohazard symbol." Treated medical waste need not be labeled.	
			<b>24. Disposal/Transportation.</b> ESS follows and understands labeling, marking, packaging, manifesting requirements for shipping medical /infectious waste.	
			<b>25. Disposal.</b> Disposal facility was prequalified under TTEC procedures to dispose of medical/infectious waste.	

**USDA Soil Permits**

			<b>26. Quarantine State/Area.</b> Project activities involve the interstate shipment or receipt of soils from on- or off-site sources and project is located within a quarantine state/area. These states include, but are not limited to, AL, AR, FL, GA, LA, MI, NC, SC, OK, PR, TN, TX. (7 CFR 301.80 , .81, .85, and .90)	
			<b>27. Certificate/Permit.</b> Certificate or permit has been obtained for the interstate shipment unless specific conditions are met allowing transport without a permit/certificate.	

ATTACHMENT C  
TETRA TECH EC, INC.  
PESM INSPECTION CHECKLIST— NON-HAZARDOUS IDW/SOLID WASTE

CONFIDENTIAL

Project:	Inspector:	Date:
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>
	<p><b>28. Attachment of Certificate/Permit To Container/Shipping Paper.</b> Certificate/permit is attached to outside of container holding soils or attached to bill of lading/shipping paper.</p>	
<b>On-Site Landfill</b>		
	<p><b>29. Design.</b> Landfill meets design requirements specified in regulations or alternative design has been approved by state/local agency. Design requirements may include liner, cover, leachate collection/gas collection, location criteria, etc. (40 CFR 258, State/local regulations)</p>	
	<p><b>30. Permitting/Licensing.</b> Permit/license has been obtained to construct/operate landfill. Construction/operation complies with conditions of permit. (State/local regulations)</p>	
	<p><b>31. Operation.</b> Landfill is operating in compliance with permit including, if applicable, O&amp;M Plan, inspection, waste acceptance, monitoring, reporting, and recordkeeping requirements. (40 CFR 258, State/local regulations)</p>	
	<p><b>32. Stormwater.</b> individual NPDES Stormwater permit has been obtained or coverage under a multi-sector/general permit has been obtained. <i>Complete "Wastewater/Stormwater Discharges/UIC" checklist to evaluate compliance.</i></p>	
<b>Unexploded Ordnance/Ordnance Explosive Waste/Chemical Warfare Material</b>		
	<p><b>33. Site-Specific UXO Work Plan.</b> A site-specific workplan has been developed for the project.</p>	
	<p><b>34. UXO Team On-site.</b> UXO team is on-site to oversee all operations which have potential for UXO/OEW.</p>	
	<p><b>35. Management.</b> OEW and CWM may be RCRA regulated material. <i>Complete "Hazardous Waste" checklists, as appropriate.</i></p>	
<p><b>Used Oil</b> <i>Note: State regulations may require that used oil be managed as a hazardous waste. If so, skip this section and complete the "Hazardous Waste" checklist.</i></p>		
	<p><b>36. Testing.</b> Used oil has been tested and determined:</p> <ul style="list-style-type: none"> <li>a. Not to be mixed with a listed hazardous waste.</li> <li>b. If mixed with a characteristically hazardous waste, it does not exhibit a characteristic of hazardous waste.</li> <li>c. Not contain more than 1,000 ppm total halogens unless it is documented that it does not contain a hazardous waste. (40 CFR 279.10, State regulations)</li> </ul>	

ATTACHMENT C  
TETRA TECH EC, INC.  
PESM INSPECTION CHECKLIST— NON-HAZARDOUS IDW/SOLID WASTE

CONFIDENTIAL

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
<b>Yes</b>	<b>No</b>	<b>N/A</b>
REQUIREMENTS		COMMENTS/NOTES
	<p><b>37. Prohibitions.</b> Used oil is:</p> <ul style="list-style-type: none"> <li>a. Not managed in a surface impoundment or waste pile.</li> <li>b. Used as dust suppressant without state/EPA approval.</li> <li>c. Burned in units, except industrial furnace, boiler, utility boiler, used oil fired space heater or hazardous waste incinerator. (40 CFR 279.12, State regulations)</li> </ul>	
	<p><b>38. Storage.</b> Used oil is stored as follows:</p> <ul style="list-style-type: none"> <li>a. In tank/container/unit subject to regulation under 40 CFR 264/265.</li> <li>b. Container/tank is in good condition.</li> <li>c. Labeled with words "Used Oil."</li> <li>d. Fill pipe connecting to UST is labeled with "Used Oil". (40 CFR 279.22, State regulations)</li> </ul> <p><i>Note: Storage may also need to comply with SPCC plan requirements under 40 CFR 112 or UST requirements under 40 CFR 280. Complete "Oil and Hazardous Substances Management" and "UST/AST Installation and Closure" checklists, as appropriate.</i></p>	
	<p><b>39. Oil-Fired Space Heaters.</b> Used oil is burned in generator's (client's) space heater which has rated capacity of no more than 0.5 mmBtu/hr. (40 CFR 279, State regulations)</p>	
	<p><b>40. Off-Site Shipment.</b> Used oil is being shipped by a transporter with an EPA Identification number or under tolling agreement where reclaimed oil is returned to project site/client's facility. (40 CFI 279.24, State regulations)</p>	
	<p><b>41. Off-Site Disposal.</b> Used oil is transported to a facility that has been approved for used oil recycling/disposal and prequalified under TTEC procedures.</p>	
	<p><b>42. DOT Compliance.</b> Used oil is transported in accordance with DOT requirements including shipping papers, packaging, marking, labeling, and placarding. <i>Complete "Oil and Hazardous Substances Management" Checklist to evaluate compliance.</i> (49 CFR 171-178)</p>	

--End of Checklist--

**EHS 3-3 ATTACHMENT C  
TETRA TECH EC, INC.  
PESM INSPECTION CHECKLIST— UNDERGROUND/ABOVEGROUND STORAGE TANK  
INSTALLATION AND CLOSURE**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes	No	N/A
<b>REQUIREMENTS</b>		<b>COMMENTS/NOTES</b>

*This checklist applies when project involves the installation, closure or corrective action of underground or aboveground storage tanks that store hazardous substances/oil. Under federal regulations, regulated USTs include tank systems used to contain hazardous substances/oil the volume of which is 10% beneath the ground. The following are not regulated USTs: heating oil tank used for consumptive use on premises, septic tanks, surface impoundment, pit, stormwater/wastewater collection, flow through process tanks, tanks which contain de minimum amounts of hazardous substances, hazardous waste tanks, wastewater treatment units that are part of a POTW/NPDES permitted facility, equipment/machinery that contains hazardous substances for operational purposes, emergency spill/overflow tanks that are emptied immediately, and tanks which are less than 110 gallons.*

*PESM should reference 40 CFR Part 282, especially Appendix A to Part 282 which details various State requirements incorporated by reference for states that have State administered UST programs to ensure State requirements are being met.*

<b>General Information</b>		
		<p><b>1. Activity.</b> Project involves the following activity at an UST/AST: (Please circle applicable activity):</p> <ul style="list-style-type: none"> <li>a. Installation</li> <li>b. Upgrading</li> <li>c. Closure: Demolition/In-place</li> <li>d. Investigation</li> <li>e. Corrective Action</li> <li>f. Other:</li> </ul>
		<p><b>2. Type of Substance.</b> For each UST/AST which is part of the project activities, identify the hazardous substance/oil it stores or historically has stored and its quantity in the adjacent column. Attach a table/list, if necessary.</p>
<p><b>USTs Installed AFTER December 22, 1988</b> (Applies if project involves installation /repairs of a new tank or upgrading to "new" tank requirements of a tank installed before December 22, 1988.) Note for item 4.) Not every state has the 1991 overfill prevention alternatives for overfill prevention in their state specific rules. NFPA does not have 1991 alternatives, but actually requires both 90% alert and the 95% shut off.</p>		
		<p><b>3. Corrosion Protection.</b> USTs meet one of following standards:</p> <ul style="list-style-type: none"> <li>a. Constructed of fiberglass-reinforced plastic (FRP);</li> <li>b. Constructed of steel and cathodically protected with dielectric material coating; field-installed cathodic protection system designed by corrosion expert; impress-current cathodic protection system and inspected every 60 days;</li> <li>c. Constructed of steel/FRP composite;</li> <li>d. Constructed of steel with no corrosion protection if site determined by corrosion expert to not be corrosive enough to cause release; or</li> <li>e. Alternative design approved by regulatory agency. (40 CFR 280.20(a) and (b))</li> </ul>


**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— UNDERGROUND/ABOVEGROUND STORAGE**  
**TANK INSTALLATION AND CLOSURE**  
**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

		<p><b>4. Spill and Overfill Prevention.</b> If tank system is filled by transfer of more than 25 gallons, it has spill/overfill protection which include:</p> <ul style="list-style-type: none"> <li>a. Equipment that will prevent release of product when transfer hose is detached from fill pipe (e.g., catchment basin);</li> <li>b. Overfill equipment that: when tank is no more than 95% full shuts off automatically; when tanks is no more than 90% full, it has a high-level alarm; and for tanks with &gt; 4,000 gal capacity, flow is restricted 30 minutes prior to overfilling with high-level alarm 1 minute before overfilling; tank has automatic shut-off flow; or</li> <li>c. Alternative equipment approved by regulatory agency. (40 CFR 280.20(c))</li> </ul>	
		<p><b>5. Proper Installation/Certified Installer.</b> Regulatory agency was notified of installation by ONE of the following certifications:</p> <ul style="list-style-type: none"> <li>a. Checklist showing that all work in manufacturer's checklist is completed;</li> <li>b. Installer is certified by tank/piping manufacturers or regulatory agency;</li> <li>c. Installation has been inspected and certified by registered PE with experience in UST installation;</li> <li>d. Installation has been approved by regulatory agency; or</li> <li>e. Another method approved by regulatory agency. (40 CFR 280.20(d) and (e))</li> </ul> <p><i>Note: State regulations may specifically require one type of certification. Check state regulations.</i></p>	
		<p><b>6. Release Detection.</b> ONE of the following release detections is being used:</p> <ul style="list-style-type: none"> <li>a. Every 30 days monitoring for release is conducted through automatic tank gauging/inventory control; vapor monitoring; groundwater monitoring; interstitial monitoring; or alternative method approved by regulatory agency;</li> <li>b. Inventory control is conducted on a monthly basis to detect any release of at least 1% of flow-through plus 130 gallons AND tightness testing every 5 years until tank is 10 years old, then tank is monitored every 30 days for releases; OR</li> <li>c. Weekly manual tank gauging is conducted if tank is 550 gallons or less. (40 CFR 280.41(a))</li> </ul> <p>Records are kept documenting compliance with inspection/monitoring/ testing requirements.</p>	


**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— UNDERGROUND/ABOVEGROUND STORAGE**  
**TANK INSTALLATION AND CLOSURE**  
**CONFIDENTIAL**

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<p><b>7. Petroleum UST Release Detection for Piping.</b> If project involves installation of an UST which stores petroleum, the UST has release detection in piping which consists of:</p> <ul style="list-style-type: none"> <li>a. Pressurized piping which is equipped with automatic line leak detector and EITHER tested annually for line tightness OR monitored monthly for releases by vapor/groundwater/interstitial/agency-approved alternative monitoring; or</li> <li>b. Suction piping requirements: below grade piping operates at less than atmospheric pressure and is sloped so that contents of pipe will drain back into tank if suction is released; only 1 check valve is included in each suction line and it is located directly below and as close as practicable to suction pump; and method is provided to check suction requirements.</li> <li>c. No release detection is required if meet suction piping requirements.</li> <li>d. If suction piping requirements are not met, piping must have line tightness test every 3 years OR monitored monthly for releases described for pressurized piping. (40 CFR 280.41(a))</li> </ul> <p>Records are kept documenting compliance with inspection/monitoring/ testing requirements.</p>	
	<p><b>8. Hazardous Substances USTs/Secondary Containment.</b> Secondary containment is designed/constructed/installed to:</p> <ul style="list-style-type: none"> <li>a. Contain substances released from tank system until they are detected and removed and prevent release to environment during operational life.</li> <li>b. Containment is checked for releases every 30 days. Records are kept of these inspections.</li> <li>c. Tank and piping designed with double-wall or external liners, including vaults to contain 100% capacity of largest tank.</li> <li>d. Pressurized piping is equipped with automatic line leak detector. (40 CFR 280.42)</li> </ul>	
<b>USTs Installed BEFORE December 22, 1988</b>		
	<p><b>9. Criteria.</b> Project involves the repair/reinstallation or closure of an UST which will meet one of the following standards: 1) UST will meet new tank systems described above; 2) UST will meet upgrading requirements described below; OR 3) UST will be closed. (40 CFR 280.21)</p>	


**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— UNDERGROUND/ABOVEGROUND STORAGE**  
**TANK INSTALLATION AND CLOSURE**  
**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

	<p><b>10. Release Prevention Upgrades.</b> If the UST is a steel tank it has:</p> <ul style="list-style-type: none"> <li>a. Internal lining which is inspected annually for 10 years/every 5 years thereafter;</li> <li>b. Cathodic protection which is installed and integrity of tank is ensured through internal inspection, monitoring every 30 days (if tank is less than 10 years old) OR tightness testing prior to installation of cathodic protection, and between 3 and 6 months (if tank is less than 10 years old); OR</li> <li>c. Alternative approved by regulatory agency. (40 CFR 280.21(b) and (c)).</li> <li>d. Piping that contains regulated substances and is in contact with ground has been upgraded by installing cathodic protection system described for new tanks (above in question 1), except that no dielectric material coating is required.</li> <li>e. Spill/overflow prevention equipment described for new tanks (above in question 2) has been installed.</li> </ul>	
	<p><b>11. Release Detection.</b> Depending upon when tank was installed, release detection/pressurized piping was installed according to timetable in regulations. Release detection includes ONE of the following.</p> <ul style="list-style-type: none"> <li>a. Every 30 days monitor release through automatic tank gauging/inventory control, vapor /groundwater /interstitial/ alternative approved monitoring;</li> <li>b. Weekly manual tank gauging (if tank is 550 gallons or less);</li> <li>c. If tank meets upgrade/new tank requirements, on a monthly basis use inventory control to detect release of at least 1% of flow-through plus 130 gallons, tightness testing every 5 years until 10 years old, then monitor every 30 days; OR</li> <li>d. If tank does not meet upgrade/new tank requirements, on a monthly basis conduct inventory control to detect release of at least 1% flow-through plus 130 gallons and tightness test EVERY year.</li> <li>e. If tank contains hazardous substances, secondary containment specified above for new tanks was installed. (40 CFR 280.40).</li> </ul> <p>Records of monitoring/inspections/tests are maintained in project files.</p>	


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<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

				<p><b>12. Piping Release Detection.</b> Depending upon when tank was installed, release detection for piping has been installed according to timetable in regulations.</p> <ul style="list-style-type: none"> <li>a. Pressurized piping which is equipped with automatic line leak detector and EITHER tested annually for line tightness OR monitored monthly for releases by vapor /groundwater /interstitial/ agency-approved alternative monitoring; OR</li> <li>b. Suction piping requirements: below grade piping operates at less than atmospheric pressure and is sloped so that contents of pipe will drain back into tank if suction is released; only 1 check valve is included in each suction line and it is located directly below and as close as practicable to suction pump; and method is provided to check suction requirements.</li> <li>c. No release detection is required if meet suction piping requirements.</li> <li>d. If suction piping requirements are not met, piping must have line tightness test every 3 years OR monitored monthly for releases described for pressurized piping.</li> <li>e. Hazardous substance tanks must have secondary containment as described for new tanks. (40 CFR 280.40).</li> </ul> <p>Records of monitoring/inspections/tests are kept in files.</p>	
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**All UST Systems** (Applies to installation, operation, repair, maintenance, etc. of all UST tanks.)

				<p><b>13. Cathodic Protection System Operation/Maintenance.</b> Cathodic protection systems must be tested by qualified tester within 6 months of installation and every 3 years. Impressed current systems are inspected every 60 days. Records of operation of cathodic protection system are maintained in project files. (40 CFR 280.31)</p>	
				<p><b>14. Repairs.</b> Repairs must prevent releases due to structural failure or corrosion. Proper personnel, specific requirements for metal/FRP piping, and testing after repairs are being complied with. (40 CFR 280.33)</p>	
				<p><b>15. Compatibility.</b> UST system is compatible with substance stored. (40 CFR 280.32)</p>	
				<p><b>16. Filling.</b> When UST is being filled, the volume in tank is checked before transfer and transfer operation is constantly monitored to prevent spills/overfills. (40 CFR 280.30(a))</p>	


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**TETRA TECH EC, INC.**  
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<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

		<p><b>17. Reporting.</b> Has a spill/overfill occurred at the project site? If so, was the following reported by the client or by TtEC in consultation with the client within 24 hours (<i>note that states may have more stringent requirements for spill reporting for their UST programs – check state reporting requirements</i>):</p> <ul style="list-style-type: none"> <li>a. Spills/overfill of 25 gallons of petroleum if released to environment.</li> <li>b. Spill of petroleum which causes sheen on surface water.</li> <li>c. Spills of more than RQ of hazardous substance.</li> </ul> <p>If not meet these criteria, was spill cleaned up within 24 hours or agency notified that cleanup was not conducted within 24 hours? (40 CFR 280.53)</p>	
		<p><b>18. Temporarily Out of Service.</b> Maintenance requirements specified in 40 CFR 280.70 must be met for USTs temporarily taken out of service. (40 CFR 280.70)</p>	
		<p><b>19. Conversion.</b> UST system is being converted to store nonregulated substances.</p> <ul style="list-style-type: none"> <li>a. The regulatory agency has been/will be notified 30 days prior to conversion.</li> <li>b. Tank is being emptied and cleaned by removing all liquids/accumulated sludges.</li> <li>c. Assessment is being performed to measure for contamination unless other monitoring indicates no release present.</li> <li>d. If release confirmed, notification has been made. (40 CFR 280.71 and .72)</li> </ul>	


**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— UNDERGROUND/ABOVEGROUND STORAGE**  
**TANK INSTALLATION AND CLOSURE**  
**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

		<p><b>20. Records.</b> Project files contain the following applicable records <i>(Mark each applicable record contained in the file.):</i></p> <ul style="list-style-type: none"> <li>a. Corrosion expert's analysis of site's corrosion potential if corrosion protection is not used on steel tank.</li> <li>b. Proper operation of cathodic protection system -- last 2 inspections for operation of system; last 3 inspections if an impressed current CPS is used.</li> <li>c. Repairs made in compliance with 40 CFR 280.33.</li> <li>d. Performance claims pertaining to any release detection system used and manner in which those claims were tested/justified by manufacturer (5 years from installation).</li> <li>e. Schedules of required calibration/maintenance provided by manufacturer of release detection equipment (5 years from installation).</li> <li>f. Results of tank tightness test (until next test conducted).</li> <li>g. Calibration, maintenance, repairs of release detection equipment (1 year).</li> <li>h. Results of site investigation if permanent closure conducted.</li> <li>i. Copies of permits, notification forms, release reports, corrective action reports, other information submitted to regulatory agency. (40 CFR 280.34(b))</li> </ul>	
		<p><b>21. Reporting.</b> Project files contain the following applicable records <i>(Mark each applicable record contained in the file.):</i></p> <ul style="list-style-type: none"> <li>a. Notification for all UST systems (certification of installation).</li> <li>b. Reports of releases, suspected releases, spills/overfills and confirmed releases described in this checklist.</li> <li>c. Corrective action planned or taken -- initial abatement measure, initial site characterization, free product removal, investigation of soil/groundwater cleanup, corrective action plan.</li> <li>d. Notification prior to permanent closure or change in service. (40 CFR 280.34(a))</li> </ul>	


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<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

<b>Investigation of Release/Corrective Action/Closure</b>		
		<p><b>22. Suspected Release Reporting.</b> The following was reported to regulatory agency within 24 hours:</p> <ul style="list-style-type: none"> <li>a. Discovery of released regulated substances at UST site.</li> <li>b. Unusual operating conditions unless equipment is found to be defective but not leaking and is repaired/replaced immediately.</li> <li>c. Monitoring results that indicate release may have occurred, unless monitoring device is defective and it is repaired/replaced and additional monitoring is satisfactory, or second month of inventory control does not confirm initial results. (40 CFR 280.50)</li> </ul>
		<p><b>23. Investigation.</b> Suspected release is investigated and confirmed within 7 days using tightness testing of tank, piping or both. If environmental contamination is basis of suspected release and UST has passed tank tightness, sampling is conducted in area where release is most likely to have occurred. (40 CFR 280.52)</p>
		<p><b>24. Confirmed Release Reporting.</b> Confirmed release has been reported by the client or by TtEC in consultation with the client to regulatory agency within 24 hours. (40 CFR 280.60)</p>
		<p><b>25. Corrective Action.</b> Corrective action is being taken to cleanup spill. <i>Circle which of the following is included in Tetra Tech EC scope of work.</i></p> <ul style="list-style-type: none"> <li>a. Identification/mitigation of fire/explosion/vapor hazards,</li> <li>b. Removal of regulated substance from UST,</li> <li>c. Prevention of further migration of released substance,</li> <li>d. Investigation to determine presence of free product,</li> <li>e. Initial site characterization,</li> <li>f. Free product removal,</li> <li>g. Investigation for soil/groundwater cleanup,</li> <li>h. Development of corrective action plan. (40 CFR 280.60 - .66)</li> </ul>
		<p><b>26. Closure.</b> The following steps were completed for closure of the UST. (40 CFR 280.71 and .72)</p> <ul style="list-style-type: none"> <li>a. <b>Notification.</b> Regulatory agency was notified 30 days prior to conducting closure. Notice is maintained in files.</li> </ul>


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Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			<p>b. <b>Emptying.</b> UST was emptied of all product and sludges and cleaned. <i>Note: Sludges/product may be "hazardous" or "special" waste or "hazardous material" subject to specific management, handling, transportation, disposal, or reuse requirements. Complete applicable checklists to demonstrate compliance with these requirements.</i></p>	
			<p>c. <b>Type of Closure.</b> UST was closed EITHER through permanent removal of all liquids and accumulated sludges OR by filling with inert material. <i>Please circle applicable activity.</i></p>	
			<p>d. <b>Site Assessment.</b> Site assessment was performed to measure for contamination unless vapor or groundwater monitoring detected no release.</p>	
			<p>e. <b>Notification if Contamination Found.</b> If contamination was found during assessment, was notification provided to regulatory agency within 24 hours?</p>	
			<p><b>27. Records.</b> Copies of permits, notification forms, release reports, corrective action reports, other information submitted to regulatory agency is maintained in project files. (40 CFR 280.34(b))</p>	
			<p><b>28. Reporting.</b> The following reports have been submitted to regulatory agencies:</p> <ul style="list-style-type: none"> <li>a. Reports of releases, suspected releases, spills/overfills and confirmed releases described in this checklist.</li> <li>b. Corrective action planned or taken -- initial abatement measure, initial site characterization, free product removal, investigation of soil/groundwater cleanup, corrective action plan.</li> <li>c. Notification prior to permanent closure or change in service. (40 CFR 280.34(a))</li> </ul>	
<p><b>Aboveground Storage Tanks</b> (<i>Applies if project involves the design/construction/repair/cleanup/closure of aboveground storage tanks that store hazardous substance/oil.</i>)</p>				
			<p><b>29. Installation/Repair.</b> Design/construction requirements for aboveground storage tanks that store petroleum/hazardous substances are dictated by Uniform Fire Code and state or local oil/hazardous substances regulations. Also, depending upon the size of the tank, an SPCC plan may be required. (UFC, state/local regulations) <i>Please also complete the "Oil and Hazardous Substances Management" Checklist.</i></p>	


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Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

				<p><b>30. Cleanup/Closure.</b> Project involves the cleaning/closure of aboveground storage tanks. ASME standards may apply. Closure of tank will likely be subject to state mini-CERCLA cleanup law if release or suspected release occurred. The state/local law may require that notifications, reports, sampling/analysis plans, QAPP plans, etc. be submitted for review and approval. (ASME, State/local regulations)</p>	
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Federal USTs (This section applies to USTs owned by Federal Agencies and are a result of the Federal Policy Act of 2005)

				<p><b>31. Inspection Requirements.</b> USTs not inspected since December 22, 1998 must be inspected by EPA or State every three years. The first three-year inspection cycle must be completed by August 8, 2010.</p>	
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				<p><b>32. Delivery Prohibition.</b> USTs must meet State eligibility requirements. (Note: Most states have set up tag programs where a green tag means that the UST is eligible to receive a delivery and a red tag means that the UST is ineligible to receive a delivery.)</p>	
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				<p><b>33. Operator Training.</b> States are to have UST operator training requirements developed by August 8, 2009. All UST operators must be trained by August 8, 2012. There are three classes of operators:</p> <p><b>Class A:</b> Personnel having primary responsibility to operate and maintain UST tank systems.</p> <p><b>Class B:</b> Personnel who are responsible for implementing UST state/federal regulatory requirements in the field.</p> <p><b>Class C:</b> Personnel who are responsible for the first line of response events indicating emergency conditions.</p>	
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				<p><b>34. Groundwater Protection.</b> Each new or replaced UST or piping system connected to a new or replaced UST, and new fuel dispenser system, that are located within 1,000 feet of an existing community water system or existing potable drinking water well, must be equipped with secondary containment (including under dispenser containment) and be monitored for leaks. (<b>Note:</b> Does not apply to repairs needed to maintain existing UST system.)</p>	
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--End of Checklist--

**EHS 3-3 ATTACHMENT C  
TETRA TECH EC, INC.  
PESM INSPECTION CHECKLIST— WASTEWATER/STORMWATER DISCHARGES/UIC**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes	No	N/A
<b>REQUIREMENTS</b>		<b>COMMENTS/NOTES</b>

*This checklist applies when wastewater/stormwater is discharged to surface water, ground, or groundwater, or if any fluids are emplaced in an Underground Injection Well.*

<b>Surface Wastewater Discharges</b>		
		<p><b>1. Point Source Discharge.</b> If the discharge constitutes a "point source" discharge into waters of the U.S., an NPDES permit has been obtained. (40 CFR 122.1(b)) <i>Note: Reference to NPDES permit in this section includes state-authorized NPDES permit.</i></p>
		<p><b>2. Exemption.</b> Certain point source discharges to waters of the U.S. are exempt from NPDES permitting, for instance, discharges to POTW or privately owned treatment works. See exclusions in 40 CFR 122.3. Project's discharge is exempt from obtaining an NPDES permit.</p>
		<p><b>3. § 401 Water Quality Certification.</b> If NPDES program is not delegated to a state and EPA issues the permit, state has issued a Clean Water Act § 401 Certification. Project activities are conducted in compliance with these terms/conditions. (40 CFR 121, State/local regulations)</p>
		<p><b>4. Permit Conditions.</b> The permit is valid. The permit terms and conditions have been reviewed and the project is operating in compliance with all terms and conditions of the permit. <i>Note: For CERCLA activities, for which a "permit" does not need to be obtained, project files contain documentation specifying effluent limits, control technology, monitoring, and if applicable, reporting/recordkeeping requirements. Project is being performed in compliance with these requirements.</i></p>
		<p><b>a. Effluent Limits.</b> Based upon review of discharge monitoring reports (DMR) and permit conditions, verify that permit discharge limits are being met.</p>
		<p><b>b. Bypass/No Effluent Exceedance.</b> Effluent bypass has occurred which did not cause effluent limitations to be exceeded. Verify that bypass was: essential to maintenance to assure efficient operation; unavoidable to prevent loss of life, personal injury, severe property damage; no feasible alternatives to bypass; exercise of reasonable engineering judgment; or adequate back-up equipment could not have been installed to prevent bypass that occurred during normal periods, equipment downtime, or preventative maintenance. [40 CFR 122.41(m)]</p>


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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<p>c. <b>Bypass/Effluent Exceedance.</b> Bypass has occurred and effluent limitations were exceeded. Notification was provided to regulatory agency.</p> <ul style="list-style-type: none"> <li>- If planned bypass, 10-day prior notice and approval was obtained.</li> <li>- If unanticipated bypass occurred, 24-hour notice was provided. [40 CFR 122.41(m)(3) and (4)]</li> </ul>	
	<p>d. <b>Upset.</b> Upset occurred and permittee can identify cause for upset. At time of upset project was operating properly, all remedial measures required by agency were complied with. [40 CFR 122.41(n)]</p>	
	<p>e. <b>Maintenance/Operation.</b> Project site and treatment/control systems are being properly operated and maintained Project files contain documentation demonstrating compliance. [40 CFR 122.41(e)]</p>	
	<p><b>5. Treatment Unit.</b> Wastewater is treated at the project site prior to discharge. The following requirements are being complied with (if applicable).</p>	
	<p>a. <b>Training.</b> Personnel who maintain/operate water pollution control unit are trained. (State/local regulations) <i>Note: This requirement usually applies to large treatment plants.</i></p>	
	<p>b. <b>Operation/Maintenance Log.</b> Operation/maintenance logs comply with requirements in state/local regulations and/or permit. Operation logs document when unit is non-operational due to maintenance/equipment failure, etc., or not operable, as well as showing when unit is operating properly.</p>	
	<p>c. <b>Sludge/Treatment Residue/Filters.</b> Management and disposal of sludge, treatment residue, and filters are complying with federal/ state solid, hazardous or special waste regulations.</p>	
	<p>d. <b>Operating/Startup/Shutdown Procedures.</b> Operating and start-up/shutdown procedures required under permit are being complied with including requirements for maintenance, inspections, alarm response, etc. (Permit conditions)</p>	
	<p><b>6. Notification/Discharge Limit Exceedances.</b> If NPDES permit limit was exceeded, regulatory agency was notified orally (within 24 hours) and written notification was submitted within 5 days. Notification was also made in monthly monitoring report. [40 CFR 122.41(l)(6) and (7)]</p>	


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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<p><b>7. Monitoring.</b> Monitoring requirements specified in NPDES permit and 40 CFR 122, Subpart C are being met. Sampling is being conducted in accordance with 40 CFR 136 unless alternative method has been approved.</p>	
	<p>a. <b>Recordkeeping.</b> Adequate documentation is being maintained of sampling date/time/location; analyses dates; individuals performing sampling/analysis; analytical methods/techniques used; and analytical results.</p>	
	<p>b. <b>DMR.</b> Monitoring results are reported and submitted on a DMR, and signed by responsible party. [40 CFR 122.41 and 122.22(b)]</p>	
	<p>a. <b>Notification.</b> Regulatory agency was notified as soon as project personnel knew or had reason to believe that:</p> <p>b. Activity has occurred or will occur that will result in discharge on a routine or frequent basis of any "toxic pollutant" for which the permit does not establish a limit and it exceeds "notification levels" in 40 CFR 122.44(f).</p> <p>c. - Activity has occurred or will occur that would result in any discharge on a non-routine or infrequent basis of "a toxic pollutant" not limited in the permit, if discharge will exceed "notification levels" specified in 40 CFR 122.44(f).</p>	
	<p><b>8. Best Management Plan.</b> If permit requires a BMP, project site has the plan &amp; implements the requirements. This may be applicable if the project site uses, manufacturers, stores, handles, or discharges any toxic pollutant listed in CWA §307(a)(1) or pollutant listed in CWA §311.</p>	
	<p><b>9. Discharge of Toxic Pollutants.</b> Project discharges aldrin/dieldrin, DDT, endrin, toxaphene, benzidine, or PCBs which have effluent standards or any other toxic pollutant listed in CWA §307(a)(1).</p> <p>a. Specified toxic pollutant effluent limits are being met.</p> <p>b. Regulatory agency has been notified within 60 days from date of promulgation of toxic pollutant standard.</p> <p>c. Reporting is being conducted in compliance with 40 CFR 129.5(d)(2).</p>	


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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<p><b>10. Permit Modification.</b> Regulatory agency has been notified as soon as practicable of any of the following events and the permit has been modified.</p> <ul style="list-style-type: none"> <li>a. Any significant changes in operation.</li> <li>b. Planned physical alterations/additions to project if it constitutes a "new source" under 40 CFR 122.29(b).</li> <li>c. Alteration/addition could significantly change the nature or increase quantity of pollutants discharged.</li> <li>d. Change affects pollutants that are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [(40 CFR 122.41(l)(1))]</li> </ul>	
	<p><b>11. Permit Transfer.</b> If transfer of NPDES permit to new permittee has occurred, the permit was revoked/reissued/modified, unless former permittee notified regulatory agency at least 30 days prior to transfer, notice described agreement between former/new permittee containing specific date of transfer/coverage/liability, and regulatory agency did not notify former permittee of intention to revoke/reissue/modify permit. (40 CFR 122.61)</p>	
	<p><b>12. Permit Renewal.</b> Permit will expire within 6 months. An application for NPDES permit was submitted at least 180 days prior to expiration of existing permit. (40 CFR 122.21(a))</p>	
	<p><b>13. Recordkeeping.</b> The following records are being kept for at least 3 years:</p> <ul style="list-style-type: none"> <li>a. All data used to complete permit applications and any supplemental information. [40 CFR 122.21(p)]</li> <li>b. Discharge monitoring reports.</li> <li>c. Notification required for routine/non-routine discharge of toxic pollutants not specified in permit under 40 CFR 122.44(f).</li> <li>d. Reports required by the permit. [40 CFR 122.44(i)(2)]</li> <li>e. Equipment calibration/maintenance records/original strip chart recordings for continuous monitoring instrumentation.</li> <li>f. Quality assurance records.</li> </ul>	
	<p><b>14. State-Specific Requirements.</b> Discharge is in compliance with state-specific permit/regulatory requirements. (State regulations)</p>	
<p><b>Discharge To Publicly Owned Treatment Works/Federally Owned Treatment Works</b> <i>(Applies when project discharges to POTW/FOTW.)</i></p>		
	<p><b>15. Permit/Approval.</b> Pre-discharge permit/approval has been obtained authorizing the discharge of wastewater to the POTW/FOTW. <i>Note in adjacent column, if the discharge permit/approval is batch, one-time approval or is sufficient for life of the project. (40 CFR 403.5)</i></p>	


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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<p><b>16. Waste Acceptance Criteria.</b> Wastewater complies with the acceptance criteria of the receiving POTW/FOTW. Documentation exists in project files signed by FOTW/POTW that they have reviewed analytical data and wastewater meets their acceptance criteria. <i>Note: This may be part of permit/approval described above. (40 CFR 403.5)</i></p>	
	<p><b>17. Treatment Unit.</b> Wastewater is treated at the project site prior to discharge. The following requirements are being complied with (if applicable). <i>[40 CFR 122.21(j)(6)(iii)(B)]</i></p>	
	<p>a. <b>Training.</b> Personnel who maintain/operate water pollution control unit are trained. (State/local regulations) <i>Note: This requirement usually applies to large treatment plants. (USC 33:26:1341)</i></p>	
	<p>b. <b>Operation/Maintenance Log.</b> Operation/maintenance logs comply with requirements in state/local regulations and/or permit. Operation logs document when unit is non-operational due to maintenance, equipment failure, etc., or not operating, as well as when unit is operating properly. (40 CFR 403.12)</p>	
	<p>c. <b>Sludge/Treatment Residue/Filters.</b> Management and disposal of sludge, treatment residue, and filters are complying with federal/state solid or hazardous or special waste regulations.</p>	
	<p>d. <b>Operating/Startup/Shutdown Procedures.</b> Operating and start-up/shutdown procedures required under permit are being complied with including requirements for maintenance, inspections, alarm response, etc. (Permit conditions)</p>	


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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<p><b>18. General Pretreatment Standards.</b> Discharge to POTW complies with general pretreatment standards. [40 CFR 403.5(b)]</p> <p>The following is prohibited from discharge:</p> <ul style="list-style-type: none"> <li>a. Fire/explosion hazards or waste streams with flashpoint below 140°F.</li> <li>b. Pollutants that will result in toxic gases/vapors/fumes in POTW in quantity to cause acute worker health/safety problems.</li> <li>c. Trucked/hailed pollutants except at discharge points designated by POTW.</li> <li>d. Pollutants that will cause corrosive damage to POTW or pH less than 5.0 unless POTW is designed to handle such discharges.</li> <li>e. Petroleum oil, non-biodegradable cutting oil, oil products of mineral oil origin, or solid or viscous pollutants that will obstruct flow/cause operation interference or pass-through.</li> <li>f. Heat in amounts that will inhibit biological activity or in such quantities that temperature at POTW influent exceeds 104°F unless POTW approves.</li> <li>g. Any pollutant, including oxygen-demanding pollutants, at flow rate or concentration that will cause interference with POTW.</li> </ul>	
	<p><b>19. Categorical Pretreatment Standards.</b> Discharge is subject to categorical pretreatment standards for industrial facilities which specify concentrations of pollutants that may be discharged to POTW, and monitoring, analysis, reporting, and recordkeeping requirements. (40 CFR 403, Appendix C; 40 CFR 403.6 and .12)</p>	
	<p><b>20. No dilution.</b> Process water or other methods are not used to dilute discharge as partial or complete substitute for treatment to achieve compliance with waste acceptance criteria/pretreatment standards. [40 CFR 403.6(d)]</p>	
	<p><b>21. No Hazardous Waste.</b> No hazardous waste is discharged to POTW. [Good Management Practice (GMP)]</p>	
	<p><b>22. Reports/Recordkeeping.</b> Reports/records required under permit/ approval and local/state regulations are being submitted/maintained. Reporting may be required prior to discharge, when upset occurs, etc. Records that may need to be maintained in project files include: copy of permit application, approval/permit, sampling/analysis, treatment unit maintenance/calibration, etc. (State/local regulations/permit)</p>	


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Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>
	<b>23. State/Local-Specific Requirements.</b> Discharge complies with state/local agency permit and regulatory requirements. (State regulations)	
<b>Discharge to Private Treatment Works</b> ( <i>Applies if wastewater is discharged to treatment system owned by a private party.</i> )		
	<b>24. Contract.</b> A contract has been signed by our client and owner of treatment system allowing discharge of wastewater to private treatment works.	
	<b>25. State Permit.</b> State permit is required to discharge to private treatment works. Project is in compliance with terms/conditions of permit, including discharge limitation, pretreatment requirements, monitoring, inspections, solid waste management plans, spill contingency plans, etc. (State regulations)	
<b>Discharge to Ground/Groundwater</b>		
	<b>26. Permit.</b> State/local agency requires that permit be obtained for the discharge of wastewater to the ground/groundwater. Verify that the project is in compliance with terms and conditions of the permit and regulations. (State/local regulations) <i>Note: For CERCLA activities for which a "permit" does not need to be obtained, project files contain documentation specifying effluent limits, control technology, monitoring, and if applicable, reporting/recordkeeping requirements. Project is being conducted in compliance with these requirements.</i>	
	<b>a. Effluent Limits.</b> Based upon review of monitoring reports and permit conditions verify that permit discharge limits are being met.	
	<b>b. Maintenance/Operation.</b> Project site and treatment/control systems are being properly operated and maintained. O&M plan has been developed (if required) and is being complied with. Operation logs document when unit is non-operational due to equipment failure, maintenance, etc., not operating, or operating properly.	
	<b>c. Other Plans.</b> Permit/regulations require development of other plans (e.g., solid waste management plan, spill contingency plan). These plans have been developed and are being complied with.	
	<b>27. Treatment Unit.</b> Wastewater is treated at the project site prior to discharge. The following requirements are being complied with (if applicable):	


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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	a. <b>Training.</b> Personnel who maintain/operate water pollution control unit are trained. (State/local regulations) <i>Note: This requirement usually applies to large treatment plants.</i>	
	b. <b>Operation/Maintenance Log.</b> Operation/maintenance logs comply with requirements in state/local regulations and/or permit.	
	c. <b>Sludge/Treatment Residue/Filters.</b> Management and disposal of sludge, treatment residue, and filters comply with federal/state solid, hazardous, or special waste regulations.	
	d. <b>Operating/Startup/Shutdown Procedures.</b> Operating and start-up/shutdown procedures required under permit are being complied with including requirements for maintenance, inspections, alarm response, etc. (Permit conditions)	
	<b>28. Monitoring.</b> Monitoring requirements specified in permit and regulations are being met. (State/local regulations/permit)	
	a. <b>Recordkeeping.</b> Adequate documentation is being maintained of sampling date/time/location; analyses dates; individuals performing sampling/analysis; analytical methods/techniques used; and analytical results.	
	b. <b>Monitoring Reports.</b> Monitoring results are reported and submitted in a timely fashion.	
	c. <b>Notification.</b> Regulatory agency was notified as soon as project personnel knew or had reason to believe exceedance occurred or other permit condition was violated.	
	<b>29. Permit Renewal.</b> Permit will expire within 6 months, and an application for permit has been submitted in a timely fashion. (State/local regulations)	
	<b>30. Reports/Recordkeeping.</b> Reports/records required under permit/ approval and local/state regulations are being submitted/maintained. Reporting may be required prior to discharge, when upset occurs, etc. Records that may need to be maintained in project files include copy of permit application, approval/permit, sampling/analysis, treatment unit maintenance/calibration, etc. (State/local regulations/permit)	

ATTACHMENT C  
TETRA TECH EC, INC.  
PESM INSPECTION CHECKLIST— WASTEWATER/STORMWATER DISCHARGES/UIC

CONFIDENTIAL

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

**Stormwater Discharges**

		<p><b>31. Applicability.</b> Project activities involve discharge of stormwater and</p> <ul style="list-style-type: none"> <li>a. Involve construction activities (i.e., clearing, grading, excavation, land disturbing) that impact greater than 5 acres under a common plan [40 CFR 122.26(a)(9)(B) &amp; (b)(15)], OR</li> <li>b. Involve construction activities (i.e., clearing, grading, excavation, land disturbing) that impact equal to or greater than 1 acre; also includes disturbance of less than 1 acre of total land area that is part of a larger common plan that will ultimately disturb more than 1 acre. (does not apply if waiver received – see 122.26(b)(15)(i)(A) &amp; (B)), OR</li> <li>c. Constitute an “industrial activity” (common types of remediation projects that are “industrial” are: landfill closures/construction; RCRA TSDF facilities, etc.). [40 CFR 122.26(b)], OR</li> <li>d. Involve construction activities impacting less than 5 acres at a client’s facility which has an existing NPDES stormwater permit.</li> <li>e. Construction activities that result in land disturbances less than 1 acre based on the potential for contribution to a violation of a water quality standard or a significant contribution of pollutants to water of the U.S.A. [122.26(b)(15)(ii)].</li> </ul>	
		<p><b>32. Permit.</b> Coverage under a general permit, individual, group, or multi-sector permit has been obtained. For general/multi-sector permit, NOI was submitted in a timely fashion per federal/state regulations. For individual permits, permit was obtained prior to discharge commencing. <i>Note: Project may constitute an “industrial activity” at a client’s facility which already has an NPDES permit. In such cases, the client has been consulted regarding modifications to individual permit, NOI, and/or Stormwater Pollution Prevention Plan (SWPPP) to include project activities. (40 CFR 122.26)</i></p> <p><i>Note: For CERCLA activities, although NOI/permit does not need to be obtained, project files must contain documentation showing that “substantive” requirements have been identified and project is in compliance with these requirements. These requirements include effluent limits, BMPs, development of SWPPPs, monitoring, and if applicable reporting/recordkeeping.</i></p>	
		<p><b>33. Permit Conditions.</b></p> <ul style="list-style-type: none"> <li>a. <b>Discharge of Non-Stormwater.</b> Non-stormwater is not combined with stormwater.</li> </ul>	

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	
	<p>b. <b>Release of Reportable Quantity of a Hazardous Substance.</b> If hazardous substance was released above RQ, NRC/other agencies were notified, SWPPP was modified in accordance with permit terms (normally about 2 weeks), and written notice was provided to regulatory agency within specified timeframe. [40 CFR 122.26(c)(1)(iii)]</p>		
	<p>c. <b>SWPPP Development.</b> SWPPP was developed in a timely fashion. State may require submittal of a certification that SWPPP was developed.[40 CFR 122.26(d)(1)(v) &amp; (d)(2)]</p>		
	<p>d. <b>EPCRA § 313 Sources.</b> If project is located at a client's facility which is subject to EPCRA § 313 TRI reporting, other permit requirements such as monthly Discharge Monitoring Reports may apply. [Check facility's stormwater permit.]</p>		
	<p><b>34. Stormwater Pollution Prevention Plan.</b> Under general, individual, or multi-sector permits, SWPPP has been developed which identifies the following. SWPPP has been reviewed and project is in compliance with its terms. [40 CFR 122.26(d)(2)(iv)]</p> <ul style="list-style-type: none"> <li>a. Pollution prevention team,</li> <li>b. Describes potential pollutant sources,</li> <li>c. Identifies Best Management Practices,</li> <li>d. Housekeeping/preventative maintenance,</li> <li>e. Spill prevention/response procedures,</li> <li>f. Inspections,</li> <li>g. Employee training,</li> <li>h. Recordkeeping/reporting,</li> <li>i. Sediment/erosion control,</li> <li>j. Management of runoff, and</li> <li>k. Comprehensive site evaluation, including schedule.</li> </ul>		
	<p><b>35. Amendment of SWPPP.</b> SWPPP has been amended if there is a change in design, construction, operation, or maintenance at project site which has a significant effect on potential for discharge of pollutants OR if plan has been ineffective.</p>		
	<p><b>36. Monitoring.</b> Monitoring is being conducted in compliance with permit and SWPPP. (Permit condition/SWPPP)</p>		
	<p><b>37. Reporting.</b> Reporting to regulatory agency is being conducted in accordance with permit conditions. This may include monitoring results/DMRs, certifications, notifications, etc. (Permit conditions)</p>		
	<p><b>38. Recordkeeping.</b> Copy of permit/NOI and SWPPP is maintained at project site. Inspection results, monitoring records, correspondence with regulatory agencies, and any other records required to be kept under the permit are maintained in the project files. (Permit conditions)</p>		


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<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

	<p><b>39. State-Specific Requirements.</b> Some states require that Stormwater Management Plan be submitted to state for review and approval for excavation activities, waste pile/stockpile management, etc. If permit is required, verify that project is in compliance with all terms and conditions of permit. (State regulations)</p>	
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<b>Discharge to Underground Injection Wells</b> <i>(Applies if project discharges wastewater to UIC or injection gallery.)</i>		
	<p><b>40. Permit/Authorization by Rule.</b> Discharge to injection well has an operating permit or is authorized by rule and the UIC is registered with the regulatory agency. The permit was obtained prior to construction of the well. (40 CFR 144.11, State/local regulations) <i>Note: Injection well is any dug hole which is deeper than it is wide into which fluids (may include oxygen) are emplaced.</i></p>	
	<p><b>41. Inventory Information.</b> UIC is authorized by rule and an inventory form has been submitted to EPA/state delegated agency. (40 CFR 144.26, State/local regulations)</p>	
	<p><b>42. Closure Notification.</b> Upon closure of well, UIC inventory form is submitted in a timely fashion (normally within 30 days of closure). Closure complies with EPA/State guidance. If required, agency reviewed/approved cleanup plan. (State/local regulations)</p>	
	<p><b>43. Authorized by Rule -- Existing Class I, II, or III Wells.</b> Project site discharges to an existing Class I, II, or III well authorized by rule. A plugging/abandonment plan has been developed in accordance with 40 CFR 144.28(c), operating requirements under 40 CFR 144.28(f), monitoring requirements under 40 CFR 144.28(g) are being met, and notification, reporting, and recordkeeping requirements specified in 40 CFR 144.28(b), (h), (j), (k), (l) and (l) are being met. <i>See definitions for Well Classification in 40 CFR 144.6.</i></p>	
	<p><b>44. Authorized by Rule -- Class IV Well.</b> Project site discharges to or involves the closure of a Class IV well which is authorized to discharge for up to 6 months after UIC program was approved/promulgated. Well is closed/plugged as approved by EPA, and EPA was notified 30 days prior to abandonment (40 CFR 144.23). <i>Note: 6 month date is 1985. Most projects involving Class IV wells will involve the closure of the well, otherwise a permit must be obtained.</i></p>	


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Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	
	<p><b>45. Authorized by Rule -- Class V Well.</b> Project involves discharge or closure of a Class V well which is authorized by rule until further requirements under future regulations become applicable. Well authorization expires if EPA requires issuance of permit or upon closure of well. (40 CFR 144.24) <i>Note: To date, EPA has not issued requirements to permit Class V wells.</i></p>		
	<p><b>46. Permitting.</b> Project site discharges to a permitted well.</p>		
	<p>a. <b>Permit Acquisition.</b> Permit has been obtained by the "operator" prior to construction. (40 CFR 144.31)</p>		
	<p>b. <b>General Permitting Requirements.</b> General permit requirements are being complied with for operation/maintenance (e.g., operating training, laboratory QA/QC, effective performance, funding, operation backup facilities); monitoring, reporting, recordkeeping and abandonment. (40 CFR 144.51)</p>		
	<p>c. <b>Class I, II or III Wells.</b> Mechanical integrity of well has been established and is being maintained. (40 CFR 144.51(q) and 146.8)</p>		
	<p>d. <b>Well-specific Requirements.</b> Operation/maintenance, effluent limits, monitoring, and recordkeeping/reporting are in compliance with permit terms and conditions. (40 CFR 144.55)</p>		
	<p>e. <b>Corrective Action.</b> If permit contains corrective action requirements, project is in compliance with those conditions. (40 CFR 144.55)</p>		
	<p><b>47. Class I Nonhazardous Well.</b> Project discharges to a Class I nonhazardous well that meets:</p> <p>a. Criteria and standards for construction specified in 40 CFR 146.12.</p> <p>b. Operating, monitoring, and reporting specified in 40 CFR 146.13.</p>		
	<p><b>48. Class II Wells.</b> Project discharges to a Class II well that meets:</p> <p>a. Criteria and standards for construction specified in 40 CFR 146.22.</p> <p>b. Operating, monitoring, and reporting specified in 40 CFR 146.23.</p>		
	<p><b>49. Class III Wells.</b> Project discharges to a Class III well that meets:</p> <p>a. Criteria and standards for construction specified in 40 CFR 146.32.</p> <p>b. Operating, monitoring, and reporting specified in 40 CFR 146.33.</p>		


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<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>
	<p><b>50. Class I Hazardous Waste Injection Well.</b> Project discharges hazardous waste into a Class I injection well that meets the following criteria:</p> <ul style="list-style-type: none"> <li>a. Waste is <u>not</u> prohibited from discharge or a waiver has been obtained under 40 CFR 148.1 and 148.10-.17.</li> <li>b. Siting under 40 CFR 146.61.</li> <li>c. Manifesting, notification, identification, maintenance of operating records, reporting, personnel training, certification of closure in accordance with 40 CFR 264 requirements.</li> <li>d. Corrective action requirements, if applicable, under 40 CFR 146.64.</li> <li>e. Construction requirements under 40 CFR 146.65 and .66.</li> <li>f. Operating requirements under 40 CFR 146.67.</li> <li>g. Continuous recording devices for monitoring compliance in accordance with 40 CFR 146.67.</li> <li>h. Testing and monitoring requirements under 40 CFR 146.68.</li> <li>i. Reporting requirements under 40 CFR 146.69.</li> <li>j. Well closure plan/post-well closure plan in accordance with 40 CFR 146.71 and .72.</li> <li>k. Land disposal restrictions in accordance with 40 CFR 148 and 268.</li> </ul>	

-- End of Checklist--

EHS 3-3 ATTACHMENT C  
 TETRA TECH EC, INC.  
 PESH INSPECTION CHECKLIST— WETLANDS/STREAMS/FLOODPLAINS

CONFIDENTIAL

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES

*This checklist applies to all projects that could potentially impact wetlands, streams, and floodplains.*

Wetlands (This section applies if wetlands are <b>suspected to be</b> located adjacent to or within the project site.)		
		<p><b>1. Delineation.</b> Wetlands have been delineated by client or Tetra Tech EC, Inc. wetlands biologist. If wetlands are found to be adjacent to or within project site, the wetlands are staked so that project mitigation measures are effective. (E.O. 11990, State/local regulations)</p>
		<p>a. <b>Non-Jurisdictional Wetlands.</b> Jurisdictional status of wetlands has been determined and supporting documentation is in file. <i>Note: documentation may be in the form of 1) a Jurisdictional Determination from the Army Corps of Engineers or State Agency, or 2) included in as part of an Army Corps of Engineers or State Permit.</i></p>
		<p><b>2. Buffer.</b> Protective buffers have been identified and area staked so that project mitigation measures are effective. Regulatory agency approved buffers &amp; documentation in file. (State/local regulations)</p>
		<p><b>3. CWA § 404 Permit.</b> If a permit was required, project activities are in compliance with the terms/conditions of the permit. (33 CFR 320-330; 40 CFR 230, state/local regulations) <i>Note: For activities conducted at CERCLA sites, coordination with EPA is required instead of Army Corps of Engineers. Project files were reviewed to verify that sufficient documentation exists to demonstrate that project underwent EPA review for wetlands impact/avoidance/mitigation. In addition, project files document that proper notification was made by EPA/client/Tetra Tech EC to state, USFWS, NMFS, State Fish and Game, SHPO, local agency.</i></p>
		<p>a. <b>Mitigation.</b> If mitigation was required, a plan was developed and approved by the regulatory agency. Project activities are being conducted in compliance with the plan.</p>
		<p>b. <b>Notification to USFWS, NMFS, State Fish and Game, SHPO, Local Agency.</b> Notification was made to these agencies and project file contains their documented response to demonstrate that project will not have an adverse impact on threatened/endangered species, cultural resources, and meets local wetlands requirements OR if agencies require mitigation, such measures are being taken.</p>
		<p>c. <b>Specific Conditions/Terms.</b> Terms and conditions of the individual or Nationwide Permit were reviewed and project is in compliance with all terms/conditions.</p>

**EHS 3-3 ATTACHMENT C  
TETRA TECH EC, INC.  
PESM INSPECTION CHECKLIST— WETLANDS/STREAMS/FLOODPLAINS**

**CONFIDENTIAL**

Project:		Inspector:	Date:	
Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			<p><b>4. Exemption.</b> Certain discharges of dredged or fill material are exempt from permitting. See exemptions in 33 CFR 320. If project activities are exempt from permitting, the EHS Plan or Work Plan contains exemption rationale.</p>	
			<p><b>5. CWA § 401 Water Quality Certification.</b> § 401 WQC was obtained from state authorizing work in wetlands. Project is in compliance with terms and conditions of that certification. (40 CFR 121, State/local regulations)</p>	
			<p><b>6. Temporary Water Quality Modification.</b> If project activities will cause the temporary exceedance of water quality criteria (normally due to excavation activities – turbidity), state/local agency may require that a temporary water quality modification be obtained. If applicable, project activities are complying with the terms and conditions of the approval. (State/local regulations)</p>	
			<p><b>7. Coastal Zone Management (CZM) Certification.</b> If wetland also located within a coastal zone, CZM Act Certification was obtained from local/state agency. If applicable, project files contain documentation and activities are complying with the terms of the CZMA. (CZMA, State/local regulations)</p>	
<p><b>Stream Bed/Bank Disturbance</b> (<i>Applies if project activities involve filling, dredging, altering, or otherwise impacting water quality in or near stream or river.</i>)</p>				
			<p><b>8. USACE § 10 or CWA § 404 permit.</b> Project activities involve dredging, filling, or land disturbing activity within "navigable waters" or "waters of the U.S." (normally below "high water mark") of stream/river. USACE § 10/CWA § 404 permit has been obtained. Project is in compliance with terms and conditions of permit. (33 CFR 320-330, 40 CFR 230)</p>	
			<p><b>9. State Fisheries.</b> Project activities involve dredging, filling, land disturbing activity, or otherwise is impacting water quality within regulated area of stream bed (normally "high water mark"). Permit/approval has been obtained from state fish/game which specifies requirements for the protection of fish. Project is in compliance with terms and conditions of the permit (e.g., erosion control, monitoring, etc.). (State/local regulations)</p>	
			<p><b>10. Shoreline Protection.</b> Project activities are located within protected shoreline area in the state and constitute a regulated activity. A Shoreline Protection permit has been obtained and project is in compliance with terms and conditions of the permit. (State/local regulations) <i>Note: If project is located within shoreline but does not constitute a "regulated activity," explain in adjacent column.</i></p>	

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<b>Project:</b>			<b>Inspector:</b>			<b>Date:</b>				
Yes	No	N/A	<b>REQUIREMENTS</b>						<b>COMMENTS/NOTES</b>	
			<p><b>11. Temporary Water Quality Modification.</b> If project activities will cause the temporary exceedance of water quality criteria (normally due to excavation activities – turbidity), state/local agency may require that a temporary water quality modification be obtained. If applicable, project activities are complying with the terms and conditions of the approval. (State/local regulations)</p>							
			<p><b>12. CWA § 401 Water Quality Certification.</b> If a federal permit/approval was obtained, § 401 WQC was obtained from the state authorizing work in wetlands. Project activities are complying with the terms of the certification. (40 CFR 121, State/local regulations)</p>							
			<p><b>13. Coastal Zone Management Certification.</b> Project activities are located within a designated coastal zone. CZMA Certification was obtained from local/state agency. Project files contain documentation, and activities are being conducted in compliance with the certification. (CZMA, State/local regulations)</p>							
			<p><b>14. Riparian Zones.</b> If project activities will cause the removal of near-stream vegetation, activities may require authorization or compliance with State regulations or local ordinances. The riparian zone width depends on the environmental resources being protected. Permit/approval has been obtained, if applicable. Project files contain documentation and activities are in compliance with permit conditions. (State/local regulations)</p>							
<p><b>Floodplain/Flood Control</b> <i>(Applies when project will potentially impact floodplains or is located in a flood control area)</i></p>										
			<p><b>15. Floodplain.</b> Project is located within a floodplain as determined through evaluation of FEMA maps or state generated floodplain maps. The project is avoiding/minimizing impacts to floodplains. Measures used to avoid/minimize impacts are documented in project files and have been reviewed/approved by applicable regulatory agency. Permit/approval has been obtained, if applicable. Field activities are in compliance with terms/conditions of permit/approval. (E.O. 11988, State/local regulations)</p>							
			<p><b>16. Flood Control.</b> Project activities involve excavation or other land disturbing activities in an area which has potential for flood problems. An evaluation has been made of pre- and post-construction flows, and measures to minimize runoff (e.g., stormwater detention/retention) are being implemented.</p>							

--End of Checklist--

**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— RADIOACTIVE MATERIAL/RADIATION**  
**FOR DEPARTMENT OF ENERGY PROJECTS**

*CONFIDENTIAL*

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

*This checklist applies to projects where radioactive material and/or types of radiation are present.*

<b>Determination of License Type</b>		
		1. DOE requires that persons/company conducting work with radioactive material be licensed for specific amounts and types of radioactive material. Is there a license? (DOE)
		2. Is there a documented Radiation Protection Program (RPP)? (10 CFR 835.101(a))
		3. Is the RPP content commensurate with the nature of the activities performed and shall include formal plans and measures for applying the ALARA process to occupational exposures? (835.101(c))
		4. Does the RPP specify the existing and/or anticipated operational tasks that are intended to be within the scope of the RPP? (835.101(d))
		5. If the RPP was updated, was a revision submitted to DOE? (835.101(g))
<b>Internal Audits</b> ( <i>Applies if a radioactive material license exists.</i> )		
		1. Are the audits of the Radiation Protection Program every 36 months? (835.102)
<b>Radiation Protection Program Management Qualifications</b> ( <i>Applies if a radioactive material license exists.</i> )		
		1. Do the individuals responsible for developing, implementing, and compliance with the requirements have the appropriate education, training, and skills? (835.103)
<b>Procedures</b> ( <i>Applies if a radioactive material license exists.</i> )		
		1. Are there written procedures developed that are consistent with the ability of the individuals exposed to the hazards? (835.104)
<b>Occupational Dose Limits</b> ( <i>Applies if a radioactive material license exists.</i> )		
		1. Are the annual limits to the occupational workers: a. 5 rem TEDE/yr (835.201(a)(1)) b. 50 rem/yr to internal organs except the eye (835.201(a)(2)) c. 15 rem/yr to the eye (835.201(a)(3)) d. Shallow dose to the skin of 50 rem/yr? (835.201(a)(4))
		2. Is there a means to authorize a Special Planned Exposure? (835.204)
		3. Is the dose limit to the fetus/embryo 0.1 rem/9 months? (835.206)
		4. Is the dose limit to minors 0.1 rem/yr? (835.207)

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				5. Is the DAC used to calculate internal dose from the inhalation of radioactive material but is this the primary means of determining dose? (835.209)	
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**Surveys and Monitoring** (*Applies if a radioactive material license exists.*)

				1. Is monitoring performed to demonstrate: <ul style="list-style-type: none"> <li>a. Detection of buildup of radioactive material (835.401(a)(4))</li> <li>b. Verify effectiveness of engineering and process controls in containing radioactive material and reducing radiation exposure (835.401(a)(5))</li> <li>c. Identify and control potential sources of individual exposure to radiation and/or radioactive material? (835.401(a)(6))</li> </ul>	
				2. Are the instruments and equipment used for monitoring: <ul style="list-style-type: none"> <li>a. Periodically maintained and calibrated on an established frequency (835.401(b)(1))</li> <li>b. Appropriate for the types(s), levels, and energies of the radiation(s) encountered (835.401(b)(2))</li> <li>c. Appropriate for existing environmental conditions (835.401(b)(3))</li> <li>d. Routinely tested for operability? (835.401(b)(4))</li> </ul>	
				3. Is monitoring of individual exposures to external radiation when radiological workers who, under typical conditions, are likely to receive: <ul style="list-style-type: none"> <li>a. An effective dose equivalent to the whole body of 0.1 rem or more in a year, or (835.402(a)(1)(i))</li> <li>b. A shallow dose equivalent to the skin or to any extremity of 5 rem or more in a year, or (835.402(a)(1)(ii))</li> <li>c. A lens of the eye dose equivalent of 1.5 rem or more in a year? (835.402(a)(1)(iii))</li> </ul>	
				4. Are there declared pregnant workers who are likely to receive from external sources a dose equivalent to the embryo/fetus in excess of 10 percent of the limit of 0.5 rem? (835.402(a)(2))	
				5. Are there occupationally exposed minors likely to receive a dose in excess of 50 percent of the limit of 0.1 rem in a year? (835.402(a)(3))	
				6. Are there individuals entering a high or very high radiation area? (835.402(1)(5))	
				7. Is monitoring of airborne radioactivity performed when: <ul style="list-style-type: none"> <li>a. An individual is likely to receive an exposure of 10 or DAC-hrs in a year (835.403(a)(1))</li> <li>b. As necessary to characterize the airborne radioactivity hazard where respiratory protective devices have been prescribed? (835.403(a)(2))</li> </ul>	

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	<p>8. Is real-time air monitoring is performed as necessary to detect and provide warning of airborne radioactivity concentrations that warrant immediate action to terminate inhalation of the insult? (835.403(b))</p>	
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**Access Control to Radiological Areas** (*Applies if a radioactive material license exists.*)

	<p>1. Is there a means for personnel entry control using one or more of the following:</p> <ul style="list-style-type: none"> <li>a. Signs and barricades (835.501(c)(1))</li> <li>b. Control devices on entrances (835.501(c)(2))</li> <li>c. Conspicuous visual and/or audible alarms (835.501(c)(3))</li> <li>d. Locked entrance ways; or (835.501(c)(4))</li> <li>e. Administrative controls (835.501(c)(5))</li> <li>f. No control(s) shall be installed at any radiological area exit that would prevent rapid evacuation of personnel under emergency conditions? (835.501(e))</li> </ul>	
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	<p>2. Are the following measures implemented for each entry in to a high or very high radiation area?</p> <ul style="list-style-type: none"> <li>a. The area is monitored as necessary during access to determine the exposure rates to which the individuals are exposed (835.502(a)(1))</li> <li>b. Each individual is monitored by a supplemental dosimetry device or other means capable of providing an immediate estimate of the individual's integrated deep dose? (835.502(a)(2))</li> </ul>	
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	<p>3. Are one or more of the following features used for each entrance or access point to a high radiation area:</p> <ul style="list-style-type: none"> <li>a. A control device that prevents entry to the area when high radiation levels exist or upon entry causes the radiation level to be reduced below that level defining a HRA (835.502(b)(1))</li> <li>b. A device that functions automatically to prevent use or operation of the radiation source or field while individuals are in the area (835.502(b)(2))</li> <li>c. A control device that energizes a conspicuous visible or audible alarm signal so that the individual entering the high radiation area and the supervisor of the activity are made aware of the entry (835.502(b)(3))</li> <li>d. Entryways that are locked. During periods when access to the area is required, positive control over each entry is maintained (835.502(b)(4))</li> <li>e. Continuous direct or electronic surveillance that is capable of preventing unauthorized entry (835.502(b)(5))</li> <li>f. A control device that will automatically generate audible and visual alarm signals to alert personnel in the area before use or operation of the radiation source and in sufficient time to permit evacuation of the area or activation of a secondary control device that will prevent use or operation of the source? (835.502(b)(6))</li> </ul>	
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<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

	4. In addition to the above requirements, are additional measures implemented to ensure individuals are not able to gain unauthorized or inadvertent access to very high radiation areas? (835.502(c))	
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**Posting and Labeling** (*Applies if a radioactive material license exists.*)

	1. Are the postings and labels include the standard radiation warning trefoil in black or magenta imposed upon a yellow background? (835.601(a))	
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	2. Are the access points to a controlled area posed whenever radiological areas or radioactive material areas exist where the total effective dose equivalent is not more than 0.1 rem in a year? (835.602(a))	
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	3. Is each access point to radiological areas and radioactive material areas posted with signs bearing the following wording: a. Radiation area (835.603(a)) b. High radiation area (835.603(b)) c. Very high radiation area (835.603(c)) d. Airborne radioactivity area (835.603(d)) e. Contamination area (835.603(e)) f. High contamination area (835.603(f)) g. Radioactive material area? (835.603(g))	
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	4. Are areas excepted from the posting requirements for periods of less than 8 continuous hours when placed under continuous observation and control of an individual knowledgeable of, and empowered to implement, required access and exposure control measures? (835.604(a))	
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**Respiratory Protection and Controls to Restrict Internal Exposures** (*Applies if a radioactive material license exists.*)

	1. Is there air monitoring as necessary to characterize the airborne radioactivity hazard where respiratory protective devices for protection against airborne radionuclides have been prescribed? (835.403(a)(2))	
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**Radiological Records** (*Applies if a radioactive material license exists.*)

	1. Are there records documenting doses received by all individuals for whom monitoring was required? (835.702(a))	
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	2. Are the results of individual external and internal dose monitoring that is performed, but not required, recorded? (835.702(b))	
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**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— RADIOACTIVE MATERIAL/RADIATION**  
**FOR DEPARTMENT OF ENERGY PROJECTS**

*CONFIDENTIAL*

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

**Radiological Criteria for License Termination** (*Applies if a radioactive material license exists.*)

**Radiation Safety Training or Instruction to Workers** (*Applies if a radioactive material license exists.*)

			<p>1. Does each individual complete radiation safety training on the topics in 835.901(c) commensurate with the hazards in the areas and the required controls? (835.901(a))</p>	
			<p>2. Is this training completed before being permitted unescorted access and before receiving occupational dose? (835.901(b)(1-2))</p>	
			<p>3. Does each individual demonstrate knowledge of the radiation safety training topics in 835.901(c) commensurate with the hazards in the area and required controls, by successful completion of an examination and performance demonstration? (835.901(b))</p>	
			<p>4. Does the Radiation safety training include the following topics, to the extent appropriate to each individual's prior training, work assignments, and degree of exposure to potential radiological hazards:</p> <ul style="list-style-type: none"> <li>a. Risks of exposure to radiation and radioactive materials, including prenatal radiation exposure; (835.901(c)(1))</li> <li>b. Basic radiological fundamentals and radiation protection concepts; (835.901(c)(2))</li> <li>c. Physical design features, administrative controls, limits, policies, procedures, alarms, and other measures implemented at the facility to manage doses and maintain doses ALARA, including both routine and emergency actions; (835.901(c)(3))</li> <li>d. Individual rights and responsibilities as related to implementation of the facility radiation protection program; (835.901(c)(4))</li> <li>e. Individual responsibilities for implementing ALARA measures required by 835.101, and; (835.901(c)(5))</li> <li>f. Individual exposure reports that may be requested? (835.901(c)(6))</li> </ul>	

**Design and Control** (*Applies if a radioactive material license exists.*)

			<p>1. Are measures taken to maintain radiation exposure in controlled areas ALARA through physical design features and administrative control as as supplementary method? (835.1001(a))</p>	
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**TETRA TECH EC, INC.**  
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<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

			<p>2. During the design of new facilities or modification of existing facilities, are the following objectives adopted:</p> <ul style="list-style-type: none"> <li>a. Optimization methods are used to assure that occupational exposure is maintained ALARA in developing and justifying facility design and physical controls (835.1002(a))</li> <li>b. The design objective for controlling personnel exposure from external sources of radiation in areas of continuous occupational occupancy are maintained at exposure levels below an average of 0.5 mrem per hour and far below this average as possible (835.1002(b))</li> <li>c. The design objective for the control of airborne radioactive material is under normal conditions, to avoid releases to the workplace atmosphere and in any situation to ALARA levels; confinement and ventilation is normally used; (835.1002(c))</li> <li>d. The design or modification and the selection of materials includes features that facilitate operations, maintenance, decontamination, and decommissioning? (835.1002(d))</li> </ul>	
			<p>3. Does the licensee, during routine operations, use the combination of physical design features and administrative control provided that:</p> <ul style="list-style-type: none"> <li>a. The anticipated occupational dose to general employees does not exceed 835.202 limits, and (835.1003(a))</li> <li>b. The ALARA process is utilized for personnel exposure to ionizing radiation? (835.1003(b))</li> </ul>	

**Radioactive Contamination Control** (*Applies if a radioactive material license exists.*)

			<p>1. Are there means to release material and equipment in contamination areas, high contamination areas, and airborne radioactivity areas to a controlled area, if:</p> <ul style="list-style-type: none"> <li>a. Removable surface contamination levels on accessible surfaces exceed the removable surface contamination levels specified; (835.1101(a)(1))</li> <li>b. Prior use suggests that the removable surface contamination levels on inaccessible surfaces are likely to exceed the removable contamination levels specified? (835.1101(a)(2))</li> </ul>	
			<p>2. Is there a means for material and equipment exceeding the removable surface contamination values specified, to be conditionally release for movement on-site from one radiological area for immediate placement in another radiological area only if appropriate monitoring is performed and appropriate controls for the movement are established and exercised? (835.1101(b))</p>	

**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— RADIOACTIVE MATERIAL/RADIATION**  
**FOR DEPARTMENT OF ENERGY PROJECTS**

*CONFIDENTIAL*

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

				<p>3. Is there a means for material and equipment with fixed contamination levels that exceed the total contamination values specified, to be released for use in controlled areas outside of radiological areas only under the following conditions:</p> <p>a. Removable surface contamination levels are below the removable surface contamination values specified; and (835.11019(c)(1))</p> <p>b. The material or equipment is routinely monitored and clearly marked or labeled to alert personnel of the contamination status? (835.1101(c)(2))</p>	
				<p>4. Does the licensee maintain and verify appropriate controls which prevent the inadvertent transfer of removable contamination to locations outside of radiological areas under normal operating conditions? (835.1102(a))</p>	
				<p>5. Are areas accessible to individuals where the measured total surface contamination levels are less than, corresponding surface contamination values specified, controlled as follows when located outside of radiological areas:</p> <p>a. The area is routinely monitored; (835.1102(c)(1))</p> <p>b. The area is conspicuously marked to warn individuals of the contaminated status? (835.1102(c)(2))</p>	
				<p>6. Are individuals exiting contamination, high contamination, or airborne radioactivity areas be monitored, as appropriate, for surface contamination? (835.1102(d))</p>	
				<p>7. Do individuals entering areas in which removable contamination exists at levels exceeding the removable surface contamination values specified, wear protective clothing? (835.1102(e))</p>	

**-- End of Checklist --**

**Purpose:** When required, this program provides the requirements to ensure a safe working environment within and around confined space operations by evaluating confined space hazards, implementing necessary controls, and regulating employee entry into confined spaces in accordance with 29 CFR 1910.146, Permit-Required Confined Spaces.

<b>Status:</b>	Complete	<b>Approved By:</b>	John DeFeis
<b>Version Date - Type:</b>	04/04/2000 - Revised	<b>Title:</b>	Confined Space Entry
<b>Category:</b>	Company Procedures	<b>Original Issue Date:</b>	02/01/95
<b>Sub-Category:</b>	Departmental/Discipline	<b>Sections:</b>	ESQ - Environmental Health & Safety Programs
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## **1.0 PURPOSE**

When required, this program provides the requirements to ensure a safe working environment within and around confined space operations by evaluating confined space hazards, implementing necessary controls, and regulating employee entry into confined spaces in accordance with 29 CFR 1910.146, Permit-Required Confined Spaces.

Confined space entries should only be made if there is not a feasible method of performing the task from outside of the confined space.

## **2.0 SCOPE**

This program applies to all Tetra Tech EC, Inc. (TtEC) employees, operations, and subcontractors.

## **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 Acceptable Entry Conditions**

The conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit-required confined space entry can safely enter into and work within the space.

### **4.2 Attendant**

An individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant's duties assigned in the employer's permit space program.

#### **4.3 Confined Space**

An enclosed area which exhibits the following characteristics:

- Is large enough and so configured that an employee can bodily enter;
- Has limited or restricted means for entry or exit; and
- Is not designed for continuous occupancy.

#### **4.4 Double Block and Bleed**

The closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

#### **4.5 Engulfment**

The surrounding and effective capture of a person by a liquid or finely divided solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

#### **4.6 Confined Space Entry Permit**

The completed document which specifies the hazards, controls, and procedures for a confined space entry.

#### **4.7 Entry**

The action by which a person passes through an opening into a confined space. Entry is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

#### **4.8 Entry Supervisor**

The person responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this section.

#### **4.9 Hazardous Atmosphere**

An atmosphere which meets one or more of the following criteria:

- Flammable gas, vapor, or mist in excess of 10 percent of the lower explosive limit; or
- An airborne concentration of a dust at a concentration that meets or exceeds its lower explosive limit (rule of thumb - visibility obscured at a distance of 5 feet); or

- Atmospheric concentration of any substance which could result in employee exposure in excess of its recommended exposure limit, i.e., Permissible Exposure Limit (PEL), Threshold Limit Value (TLV), or manufacturer's limit; or
- Immediately dangerous to life or health (IDLH).

#### **4.10 Inerting**

The displacement of the atmosphere in a permit space by a noncombustible gas to such an extent that the resulting atmosphere is noncombustible.

#### **4.11 Isolation**

A pre-entry requirement which assures that the confined space has been completely taken out of service and insures that accidental introduction of hazardous substances into the confined space may not take place. Isolation may include blinding, double blocking with bleed valves, capping, and/or lockout/tagout.

#### **4.12 Line Breaking**

The intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.

#### **4.13 Non-permit Required Confined Space**

A confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

#### **4.14 Oxygen Deficient**

An atmosphere containing less than 19.5 percent oxygen by volume.

#### **4.15 Oxygen Enriched**

An atmosphere containing 22.0 percent or more oxygen by volume. (Note: The 22% upper limit is an NFPA 306k, Certification of Hot Work, Consensus Standard.)

#### **4.16 Permit Required Confined Space**

A confined space which has one or more of the following characteristics:

- Contains or has the potential to contain a hazardous atmosphere;
- Contains a material that has the potential for engulfment of the entrant; or
- Has an internal configuration that could trap or asphyxiate an entrant.

#### **4.17 Prohibited Conditions**

Any condition in a permit space that is not allowed by the permit during the period when entry is authorized.

#### **4.18 Retrieval System**

The equipment used for non-entry rescue of persons from permit spaces.

### **5.0 DISCUSSION**

#### **5.1 Responsibilities**

##### **5.1.1 Authorized Entrants**

Entrants are responsible for the following:

- Inspection of operability and integrity of all respiratory apparatus, safety equipment, and personal protective equipment (PPE) to be used/worn;
- Knowing hazards, mode of exposure, signs and symptoms, and consequences of hazardous exposure;
- Communicating with the attendant as necessary to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space;
- Notifying the attendant of undetected / unnoticed hazards which could cause harm or injury to team personnel, warning signs and symptoms of exposure, and prohibited conditions;
- Wearing the designated respiratory apparatus, safety equipment, and PPE in accordance with EHS 5-2, Respiratory Protection and EHS 5-1, Personal Protective Equipment;
- Knowing the emergency procedures; and
- Exiting from the permit space when evacuation is ordered, warning signs or symptoms of exposure are noted, a prohibited condition is noted, or an alarm is activated.

##### **5.1.2 Attendants**

Attendants are required to assume the following duties and responsibilities:

- Inspection of operability and integrity of all respiratory apparatus, safety equipment, and PPE to be used/work in accordance with EHS 5-2, Respiratory Protection and EHS 5-1, Personal Protective Equipment;
- Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;
- Be aware of possible behavioral effects of hazard exposure in authorized entrants;

- Communicate with authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space;
- Leave their position only after being physically replaced by another attendant. If required to leave their post and no replacement is available, they must evacuate all personnel from within the confined space before leaving;
- Monitor activities inside and outside the space to determine if it is safe for entrants to remain in the space and order the authorized entrants to evacuate the permit space immediately if a prohibited condition is noted, if an authorized entrant shows behavioral effects of a hazard exposure, if a saturation develops outside the confined space that may endanger the entrants, or if the attendant cannot effectively and safely perform his or her required duties;
- Summon rescue and emergency services;
- Warn unauthorized persons that they must stay away from the permit space, advise them to exit immediately if they enter the permit space, and inform the entry supervisor if they enter the space;
- Perform non-entry rescues;
- Perform no duties that interfere with the attendant's primary duty to monitor and protect the authorized entrants;
- Remain in constant communication with the entrant at all times; and
- Perform atmospheric monitoring per the confined space permit under the direction of the entry supervisor, if trained to perform the monitoring.

### 5.1.3 Entry Supervisors

Entry supervisors have the following responsibilities:

- Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposures;
- Verifies by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin;
- Verifies that rescue services are available and that the means for summoning them are operable;
- Removes unauthorized individual who enter or who attempt to enter the permit space during entry operations;
- Determines, whenever responsibility for a permit space entry operation is transferred and at intervals dictated by the hazards and operations performed within the space, that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained;
- Ensures full compliance with TtEC and customer permit requirements;
- Ensures that all confined space pre-entry precautions have been taken;

- Ensures that atmosphere/personnel monitoring is performed at adequate frequencies to protect the safety and well being of the entry personnel;
- Ensures that emergency procedures and individual assignments are clearly defined, and to coordinate rescue procedures if necessary; and
- Terminates the entry and cancels the permit.

The entry supervisor may also serve as attendant.

#### **5.1.4 Line Management**

The Project Manager (PM) has the responsibility for:

- Ensuring implementation of the confined space entry program
- Ensuring that only trained, qualified, and medically fit personnel participate in confined space entry operations; and
- Ensuring that adequate, appropriate, and properly maintained equipment required to safely enter a confined space and successfully complete the task.

### **5.2 Procedure**

The following sections provide the requirements for pre-entry activities, pre-entry briefings, confined space operations, and program review requirements. Complete implementation of these requirements is necessary to ensure the health and safety of personnel during confined space operations.

No entries shall be made into confined spaces with:

- IDLH atmospheres;
- LEL readings in excess of 10% or a combustible dust atmosphere in excess of the LEL; or
- An oxygen content of less than 19.5% or greater than 22.0%.

#### **5.2.1 Hazard Evaluation**

Prior to the initiation of a confined space entry, a hazard evaluation of the space shall be conducted by the entry supervisor to determine what chemical and physical hazards are present. This review shall be documented on the entry permit and include, but not be limited to the following:

- Potential for oxygen deficient or enriched atmosphere;
- Presence of a flammable atmosphere;
- Presence of toxic air contaminants;
- Presence of physical hazards;
- Sources of hazardous energy that must be de-energized to effectively isolate the confined space;

- Other permits, such as hot-work or lockout/tagout, required to control hazards; and
- Acceptable entry conditions.

Various sources of information for hazard identification that may be used include blueprints, as-builts, client employee knowledge, past entry information, air monitoring data, and physical inspection. For each hazard identified, an effective means of control shall be documented on the confined space entry permit.

### **5.2.2 Atmospheric Testing**

The atmosphere of the confined space shall be tested to determine the initial concentrations of the following:

- Oxygen content;
- Flammable or combustible gases or vapors; and
- Toxic air contaminants.

Testing for the initial concentrations shall be conducted in the order given and documented on the entry permit. LEL, oxygen, and toxicity readings must be taken at least every 15 minutes. If isolation of the space is unfeasible because the space is large or part of a continuous system, the monitoring shall be continuous. Frequency for periodic monitoring during the confined space entry shall be specified and documented on the permit.

### **5.2.3 Ventilation**

Mechanical ventilation shall be initiated where necessary to prevent exposure of employees to hazardous atmospheres. The ventilation shall meet the following requirements:

- It shall be continuous;
- It shall be directed into the immediate area authorized entrants shall work in;
- The air supply shall be from a clean source and shall not increase the hazards in the area; and
- Employees shall not enter the space until the ventilation clears the hazardous atmosphere.

When ventilation practices cannot be used, a supplied air respirator must be utilized. Exceptions may be made by the Project Environmental and Safety Manager (PESM).

Ventilation equipment must be bonded and grounded prior to operation. Ventilator exhausts must be directed down wind from personnel and/or areas that contain buildings, equipment, etc.

### **5.2.4 Isolation**

All permitted spaces shall be removed from service and completely protected against the release of energy and material into the space. Means used to isolate the space include but are not limited to the following:

- Lockout/tagout in accordance with EHS 6-4;

- Disconnection of mechanical linkages and hazards;
- Blanking, blinding, or misaligning piping; or
- Double blocking and bleeding.

#### **5.2.5 Equipment Staging**

The following equipment shall be available as necessary and inspected prior to use:

- Testing and monitoring equipment;
- Ventilation equipment
- Communications equipment;
- Personal protective equipment;
- Lighting equipment (caged, waterproof, and low voltage);
- Barriers and shields;
- Ingress and egress equipment;
- Rescue and emergency equipment; and
- Any other equipment required to make safe entry into the space.

In spaces where the potential for flammable or combustible atmospheres exists, equipment shall be non-sparking and intrinsically safe. Electrical systems shall be GFCI protected.

### **5.2.6 Emergency and Rescue Procedures**

Based upon the location, hazards, and configuration of the confined space, the entry supervisor shall ensure that the following items are addressed:

- Rescue and emergency services to be used and means of summoning;
- Means of rescuing entrants;
- Rescue and emergency to be used at the site;
- Duties of personnel during emergencies; and
- Prevention of unauthorized entry during rescues.

### **5.2.7 Client/Contractor Coordination**

To ensure safe and efficient operations when TtEC personnel and client or subcontractor employees will make entry together into the same confined space, the following shall be completed by the entry supervisor:

- Inform TtEC contractors of existing confined spaces;
- Provide TtEC contractors with a copy of this program;
- Inform the contractor of known hazards in the space;
- Provide a list of controls implemented previously;
- Coordinate the entry of the personnel; and
- Debrief the contractor regarding this program and any hazards encountered.

When TtEC personnel are required to perform confined space entry in support of client work, the entry supervisor shall complete the following in addition to the above requirements:

- Obtain any available information on the space from the client;
- Coordinate the entry operations with client personnel; and
- Inform the client of entry hazards encountered.

### **5.2.8 Pre-Entry Briefing**

Prior to initiating a confined space entry, the entry supervisor shall conduct a safety briefing with the authorized entrants, attendants, and other relevant personnel. The briefing shall cover the following at a minimum:

- Hazard Communication (including the signs, symptoms, and modalities of chemical over exposure) in accordance with EHS 4-2, Hazard Communications;
- Physical hazards present;
- All hazard controls;

- Acceptable entry conditions;
- Emergency procedures;
- Rescue procedures;
- Duties of entrants and attendants during routine and emergency operations;
- Frequency and Types of air monitoring;
- Communications system and backup to be used;
- Review of work to be accomplished during entry;
- Decontamination procedures (if necessary);
- PPE disposal; and
- Potential emergencies that may occur outside the confined space.

Attachment A or an equivalent checklist shall be used to document pre-entry briefing.

At the end of the briefing, all personnel shall be given opportunity to ask questions and review the permit. After review, each authorized entrant and attendant shall print and sign his/her name on the permit. The completed permit shall be posted at the entry site and serve as a roster for monitoring entry and exit of personnel from the space.

### 5.2.9 Confined Space Operations

The following practices shall be adhered to during actual confined space entries:

- All confined spaces will be treated as permit-required confined spaces unless the PESM specifically provides an exemption in the EHS Plan, or by a field change request to the Plan. Prior to entry, a properly executed permit shall be in place and signed by the Entry Supervisor, Attendant, and each Entrant. Attachment B, or an equivalent form that is approved for use by the PESM, shall be used.

The Entry Supervisor shall certify that all equipment is in place and operable, acceptable entry conditions are present, all personnel have been fully briefed and all personnel have signed the permit prior to initiating entry.

- The work area outside the space shall be barricaded to prevent unauthorized personnel from interrupting the attendants or entering the space. Unauthorized personnel shall be asked to leave the barricaded area. If unauthorized personnel refuse to leave the area, operations shall be terminated.
- Atmospheric monitoring for oxygen, LEL, and toxic air contaminants shall be conducted at the frequency noted on the permit. Results shall be logged on the permit.
- No confined space shall be entered without:
  - A full body harness;
  - A 6' lanyard attached to the harness "D" ring; and

- A lifeline attached to the lanyard with the opposite end secured outside the confined space. The lanyard and lifeline must have double locking rings.

Note: Wristlets may be used in lieu of a full body harness if the body harness is infeasible or creates a greater hazard.

- Top entries with a fall potential greater than 5 feet shall be made with fall protection. Fall protection shall meet the criteria specified in 29 CFR 1926.502(d).
- At least one attendant is required for permit-required entries. The attendant shall maintain visual or voice communications with entrants at all times. Attendants shall not leave their post unless formally relieved by another authorized attendant. The replacement shall be fully briefed by the entry supervisor on all information covered in the pre-entry briefing. Entry supervisors may also serve as attendants.
- When any confined space is entered where the noise level or respirator used prevents voice communication, visual contact between the standby and workers must be maintained.
- Metal ladders, hand tools or other instruments which may spark or cause a source of ignition, are not to be used within confined spaces where any detectable amounts of LEL's are present.
- No burning, grinding, chipping, or other operation which produces heat, sparks, or ignition sources are to be performed without a hot work permit.
- One attendant shall be dressed in the same PPE as the authorized entrants, except for respiratory protection. Attendant supplied air shall be from a different source than that of authorized entrants.
- The entry supervisor shall terminate operations when the work is completed, an unacceptable entry condition is detected, or another emergency inside or outside the space is detected. Authorized entrants shall immediately evacuate upon notification of the termination.
- Attendants may monitor multiple sites only if they are able to maintain continuous visual or voice communications with entrants. If continuous communications cannot be maintained, additional attendants shall be used.
- Attendants shall perform non-entry rescues in emergencies using rescue equipment staged at the site.
- Upon completion of work and exit of the entrants, the permit shall be canceled by the entry supervisor and forwarded to the ESS. Permits shall be maintained as a part of the project file.

#### **5.2.10 Deviation From Program Requirements**

- Any deviation from this procedure requires the approval of the PESM.
- Approval for entry into permit-required confined spaces with air purifying respirators will be given if:
  - The composition of the hazardous substance(s) in the confined space is well defined;
  - The hazardous substance(s) have good warning properties;

- Short-term exposure to the hazardous substance(s) in excess of the recommended exposure limit will not result in serious physical harm;
- The efficiency of the cartridge versus the hazardous substance(s) is known;
- Forced air ventilation is utilized;
- Reliable monitoring methods are available; and
- Monitoring shows airborne concentrations to be less than the recommended exposure level for the contaminants.

#### **5.2.11 Identification of Confined Spaces**

A survey of the sites shall be performed prior to the start of work and documented to identify permit-required confined spaces. All permit-required confined spaces shall be identified with a sign. The sign shall contain the following wording of equivalent:

DANGER - PERMIT REQUIRED CONFINED SPACE

DO NOT ENTER

#### **5.2.12 Program Review**

The effectiveness of program implementation shall be reviewed by the PESM during site EHS inspections pursuant to EHS 3-3, Inspections, using the canceled permits and relevant incident information. The program will be modified, as necessary, on the basis of the PESM program reviews.

#### **5.2.13 Training**

Authorized entrants, attendants, and entry supervisors shall be trained in accordance with 29 CFR 1910.146 (g) including the following topics as appropriate:

- The contents of this procedure;
- Their respective duties;
- CPR /First Aid (attendants and entry supervisors if they are serving as rescue personnel);
- Hazards commonly found in confined spaces;
- Lockout/tagout procedures;
- Isolation practices;
- Ventilation of confined spaces;
- Supplied air respiratory protection and SCBAs;
- Self rescue;
- Methods of communication;
- Atmospheric monitoring; and

- Rescues.

Training shall establish employee proficiency in the skills required for confined space entry and the understanding and knowledge for the safe performance of all duties required by this procedure. Training records shall be maintained in accordance with EHS 1-9, Recordkeeping.

## **6.0 REFERENCES**

29 CFR 1910.146, Permit-Required Confined Spaces  
29 CFR 1926.502(d), Fall Protection.  
Environmental, Health & Safety - Programs Procedure EHS 1-9, Recordkeeping  
Environmental, Health & Safety - Programs Procedure EHS 3-3, Inspections  
Environmental, Health & Safety - Programs Procedure EHS 4-2, Hazard Communication  
Environmental, Health & Safety - Programs Procedure EHS 5-1, Personal Protective Equipment  
Environmental, Health & Safety - Programs Procedure EHS 5-2, Respiratory Protection  
Environmental, Health & Safety - Programs Procedure EHS 6-4, Lockout/Tagout  
OSHA (U.S. Department of Labor, Occupational Safety and Health Administration)

## **7.0 ATTACHMENTS**

[Attachment A - Pre-Entry Briefing Checklist](#)  
[Attachment B - Confined Space Entry Permit](#)

**EHS 6-1 ATTACHMENT A**  
**PRE-ENTRY BRIEFING CHECKLIST**

Click the icon below to [launch or download](#).



EHS 6-1 Attachment A.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

**EHS 6-1 ATTACHMENT B**  
**CONFINED SPACE ENTRY PERMIT**

Click the icon below to [launch or download](#).



EHS 6-1 Attachment B rev 3.doc

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# EHS 6-1 ATTACHMENT A



## CONFINED SPACE ENTRY PRE-ENTRY BRIEFING CHECKLIST

**Project Name:** \_\_\_\_\_ **Project Location:** \_\_\_\_\_

**Date:** \_\_\_\_\_ **Time:** \_\_\_\_\_

**Completed By:** \_\_\_\_\_

**Attendee(s):** \_\_\_\_\_

- Hazard Communication (including the signs, symptoms, and modalities of chemical overexposure.
- Physical hazards present.
- All hazard controls.
- Acceptable entry conditions.
- Emergency procedures.
- Rescue procedures.
- Duties of entrants and attendants during routine and emergency operations.
- Frequency and Types of Monitoring.
- Communications system backup to be used.
- Review of work to be accomplished during entry.
- Decontamination procedures (if necessary).
- PPE disposal
- Potential emergencies that may occur outside the confined space.

**PRELIMINARY EHS 6-1 ATTACHMENT B**



**CONFINED SPACE ENTRY PERMIT**

**PERMIT VALID FOR ONE SHIFT ONLY. ALL PERMIT COPIES REMAIN AT SITE UNTIL JOB COMPLETED.**

DATE: \_\_\_\_\_ SITE LOCATION/DESCRIPTION: \_\_\_\_\_

PURPOSE OF ENTRY: \_\_\_\_\_

SUPERVISOR(S) IN CHARGE OF CREWS/TYPE OF CREW/PHONE #: \_\_\_\_\_

COMMUNICATION PROCEDURES: \_\_\_\_\_

RESCUE PROCEDURES AND PHONE NUMBERS: \_\_\_\_\_

Name of Emergency Service (ES)	Phone# of ES	Date/Time ES contacted	ES Available ? Y or N	Date/Time ES Response Made		Comments/Problems with Service
				Before Confined Space	After Confined Space	

REQUIREMENTS COMPLETED	DATE	TIME	REQUIREMENTS COMPLETED	DATE	TIME
Breathing Apparatus	_____	_____	Line(s) Broken-Cappe Blank	_____	_____
Emergency Escape/Fall Retrieval Equipment	_____	_____	Protective Clothing	_____	_____
Fire Extinguishers	_____	_____	Purge-Flush and Vent	_____	_____
Full Body Harness w/ "D" Ring	_____	_____	Respiratory Protection	_____	_____
Lifelines	_____	_____	Secure Area (Post and Flag)	_____	_____
Lighting (Explosive Proof)	_____	_____	Standby Safety Personnel	_____	_____
			Ventilation	_____	_____

Note: For items that do not apply, enter N/A in the blank. See page 2 to add any special requirements.

**RECORD MONITORING RESULTS EVERY 1/4 HOUR**

TEST(S) TO BE TAKEN	Permissible Entry Level	Time(s)
PERCENT OF OXYGEN	19.5% to 22.0%	_____
LOWER FLAMMABLE LIMIT	Under 10 %	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

REMARKS: \_\_\_\_\_



**Purpose:** This program provides the requirements for activities involving excavations in accordance with 29 CFR 1926, Subpart P - Excavations.

<b>Status:</b>	Complete	<b>Approved By:</b>	John DeFeis
<b>Version Date - Type:</b>	07/03/2001 - Revised	<b>Title:</b>	Excavation and Trenching
<b>Category:</b>	Company Procedures	<b>Original Issue Date:</b>	02/01/95
<b>Sub-Category:</b>	Departmental/Discipline	<b>Sections:</b>	ESQ - Environmental Health & Safety Programs
<b>Keyword Index:</b>	EHS Compliance/Waste Management, Field Activities/Science, Operational Control, Training, Monitoring	<b>Document Type:</b>	Procedure
		<b>Document Owner:</b>	Skip Parry

Section

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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 PESM 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

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**EHS 6-3 ATTACHMENT B  
SOILS ANALYSIS CHECKLIST**

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EHS 6-3 Attachment B.doc

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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**

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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.*

**Purpose:** The purpose of this program is to establish a method to protect personnel from injury (e.g. burns, shocks, asphyxiation) and to prevent fires as a result of welding and hot work.

<b>Status:</b>	Complete	<b>Approved By:</b>	John DeFeis
<b>Version Date - Type:</b>	01/06/2009 - New	<b>Title:</b>	Welding/Hot Work
<b>Category:</b>	Company Procedures	<b>Original Issue Date:</b>	02/01/95
<b>Sub-Category:</b>	Departmental/Discipline	<b>Sections:</b>	ESQ - Environmental Health & Safety Programs
<b>Keyword Index:</b>	EHS Compliance/Waste Management, Field Activities/Science, Operational Control, Training, Communication	<b>Document Type:</b>	Procedure
		<b>Document Owner:</b>	Skip Parry

- 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 procedure is to establish a method to protect personnel from injury (e.g. burns, shocks, asphyxiation) and to prevent fires as a result of welding and hot work.

## 2.0 SCOPE

This document applies to all welding, cutting, grinding or other spark-producing or open flame activities on Tetra Tech EC, Inc. (TtEC) project sites, including but not limited to brazing, cutting, welding, grinding, soldering, pipe thawing, and thermite welding (cadwelds).

## 3.0 MINIMUM REQUIREMENTS

### 3.1 Responsibilities

### 3.1.1 Environmental, Health and Safety Personnel

The Director, Environmental, Safety and Quality (ESQ) Programs is responsible for this procedure.

The Environmental and Safety Supervisor (ESS) is responsible for providing oversight of hot work and welding activities.

The Project Environmental Safety Manager (PESM) is responsible for providing consultation to the Project, including appropriate protective equipment and worker monitoring.

### 3.1.2 Permit Authorizing Individual (PAI)

The PAI is designated by in writing by management. The PAI(s) will have the experience and training to understand the risks and mitigation methods of hot work.

For Task Specific areas, the PAI:

- Inspects for flammable materials, hazardous processes and other fire hazards that are, or likely to be present in the work location.

- Ensures the protection of combustibles from ignition by moving the work to a location that is free from combustibles, moving the combustibles away, or covering combustibles with a fire resistant covering.

- Verifies that fire protection and extinguishing equipment are available at the hot work site.

- Determines when Fire Watches are required and verifies that a fire watch is at the Task Specific site.

- Identifies the PPE that is required for the Hot Work Operator (consults with the ESS and PESM as necessary).

- Completes and issues the Hot Work Permits for work in Task-Specific Areas (Attachment A).

*(Note: Task-Specific Hot Work Area is for hot work that is performed outside of a Designated Area and for a specific task that is made fire safe by removing or protecting combustibles from ignition sources. Hot Work Permits are required for Task Specific hot work and are valid for one shift only. Fire watches are typically required).*

For Designated Areas, the PAI:

- Provides regular inspection of Designated Areas

- Verifies that unnecessary combustible, flammable materials have not been brought into the Designated Areas (Attachment B - Hot Work Precautions Checklist may be used).

*(Note: A Designated (Hot Work) Area is a permanent, specific location designed or approved for hot work operations to be performed regularly (e.g., a maintenance shop or a detached defined outside location that is of noncombustible or fire-resistant construction), that is essentially free of combustible and flammable contents, and is suitably separated from adjacent areas. The Designated Area must be maintained free of combustibles as this area allows hot work at any time. A fire watch or a hot work permit is not typically required. The PAI is responsible for daily inspections when the area is in use).*

### 3.1.3 Hot Work Operator

Hot Work Operators are responsible for:

- The safe operation of equipment in accordance with the manufacturer's instructions.

- Wear/use the proper PPE.

- Awareness of the hazards of hot work and emergency procedures in the event of a fire.

- Having the PAI approval before starting hot work operations.

Ceasing work if unsafe conditions develop and notifying the PAI.

#### **3.1.4 Fire Watch**

Individuals assigned to observe and protect the Hot Work Operator and property. The Fire Watch is responsible for:

Fire safe actions have been completed in the area prior to the start of hot work (combustibles/flammables removed, openings in wall/floor covered, areas below are free of combustible materials). 10 ABC or larger fire extinguisher immediately available and maintained throughout the performance of work.

Suspending the work if unsafe conditions develop.

Quenching or Extinguishing incipient fires and summoning assistance in case of fire

### **3.2 Hot Work Operations**

#### **3.2.1 Hot Work and Flame/Spark Producing Equipment**

The PAI shall examine the Task Specific Area where the work is to be performed and shall ensure that:

Sprinkles, if provided, are in service and will not be taken out of service until this work has been completed.

Within 35 feet of the hot work

Combustible lint, dust, vapors, liquids, or unpurged tanks or equipment previously containing such materials are removed or protected with fire resistant covers.

All floor and wall openings within 35 feet of the hot work will be tightly covered or protected with fire-resistant covers (Note: Some processes such as air carbon arc cutting and plasma cutting may cause sparks to travel in excess of 35 feet requiring the area to be expanded).

The work will be confined to the area or equipment specified in the permit.

Floors and surroundings have been swept clean, with combustible floors and construction formwork (if any) dampened.

A suitable fire extinguisher is available at the hot work site. (an additional water bucket, sprayer, or damp sand may be used for quenching, cooling or covering hot slag or smoldering material)

Proper personal protective equipment (PPE) is identified in the hot work permit and is being worn by persons performing or observing the work.

One or more fire watch persons have been assigned to watch for sparks in the area, as well as on floors above and below, and the fire watch stays in the area for a minimum of 30 minutes after the end of the hot work activity.

Arrangements have been made for a patrol of the area, including floors above and below, during any lunch or rest period. Task Specific Hot work permits are good for one shift only.

All containers (drums, tanks, piping) are considered unsafe for welding, cutting or heating until it has been made safe, or declared safe by a qualified person.

The Hot Work Permit included as Attachment A or an equivalent form has been completed.

#### **3.2.2 Ventilation, Gases & Vapors**

The PAI will consult with the ESS and PESM to determine the appropriate PPE and the need for monitoring the area and worker(s) when certain metals or other significant toxics are known or suspected. Table 3.2.2-1 identifies the ventilation and respiratory protection that are required. When respiratory protection is to be used, the PESM will assist in the selection of the equipment and ensuring that the elements of a respiratory

protection program are in place. Refer to EHS 5-2 and the project planning documents (Health and Safety Plan, IH Monitoring Plan or AHA).

**Table 3.2.2-1 Work Categories and Ventilation/Respiratory Protection (OSHA-based)**

Hot Work Type	Type of Ventilation or Respiratory Protection Required*	Comments & Notes
<p><b><u>In Any Enclosed Space</u></b></p> <ul style="list-style-type: none"> <li>- Zinc-Bearing, Chrome-bearing base or filler metals, or materials coated with chrome bearing materials</li> <li>- Lead based materials, Cadmium bearing filler materials or cadmium coated materials</li> <li>- Zinc-bearing base or filler metals or coatings</li> <li>- Mercury bearing coatings</li> </ul>	<p>General Ventilation and Local exhaust required, sampling demonstrates otherwise <b>OR</b> workers protected by supplied air respirators</p>	<p>Respiratory Protection (supplied air) required when safe limits are not achieved. PESH involvement required</p>
<p><b><u>Confined Spaces</u></b></p> <ul style="list-style-type: none"> <li>- Any hot work</li> </ul>	<p>General Ventilation required,</p>	<p>Respiratory Protection (supplied air) required when safe limits are not achieved. PESH involvement required</p>
<p><b><u>In Any Location</u></b> Beryllium Containing base or filler metals</p>	<p>General Ventilation and local exhaust required and workers protected by supplied air respirators.</p>	
<p><b><u>In Any Location</u></b> GMAC welding on Stainless Steels</p>	<p>Local Exhaust <b>OR</b> supplied air respirators</p>	
<p><b><u>Open Areas (outside) Involving</u></b></p> <ul style="list-style-type: none"> <li>- Zinc-Bearing, Chrome-bearing base or filler metals, or materials coated with chrome bearing materials</li> <li>- Lead based materials,</li> <li>- Cadmium bearing filler materials or cadmium coated materials</li> <li>- Zinc-bearing base or filler metals or coatings</li> <li>- Mercury bearing coatings</li> </ul>	<p>Workers protected by filter type respirators</p>	
<p><b><u>General Welding, Cutting &amp; Heating</u></b> (not involving metals shown above)</p>	<p>Ventilation not required unless 29 CFR 1926, Subpart D limits are exceeded</p>	<p>Sampling may be required to verify TLV in 29 CFR 1926, Subpart D not exceeded – respiratory protection required if exceeded.</p>

\* Any other employees exposed to the same atmosphere will be protected in the same manner as the welder or cutter.

The hot work on surfaces with protective coatings will be evaluated for flammability and if flammable, stripped or removed at least 4 inches from the area of heat application, or the employees involved in the hot work area will be protected by a respirator.

### 3.2.3 Personal Protective Equipment

Workers and observers in hot work areas will have eye protection (safety glasses with side shields or ventilated goggles), face shields, safety toed boots, and hearing protection. Welding operators will have welding helmets with the appropriate shade lenses (auto-darkening preferred) (#11- #13 for SMAW welding, #3 - #5 for cutting). Dependent on the processes and materials, welding helmets with powered air purification systems may be appropriate. Clothing will be fire resistant. Dependent on the process, leather (or equivalent) apron, capes, sleeves, or chaps may be appropriate. If full face respirators are required, they will be equipped with protective lenses. Insulated leather welding gloves (appropriate to the process) will be worn during welding, cutting and heating activities.

Welders and others exposed to Inert-gas metal arc welding must have all skin completely covered to prevent burns and other damage by ultraviolet rays.

Designated Hot Work Areas will be posted with the PPE requirements.

#### **3.2.4 Hot Work in Confined Spaces**

Any Hot Work within a confined space is a high hazard activity and requires a consultation and approval of the PESM. Job Specific Controls for the work will be developed.

When hot work is being performed in a confined space, welding machines and gas cylinders shall be left outside. Heavy portable equipment mounted on wheels shall be securely blocked to prevent accidental movement. In addition to a hot work permit, all the requirements of EHS 6-1, Confined Space Entry, shall be followed, including the completion of a confined space entry permit.

#### **3.2.5 Welding on Systems that Contain or Have Contained Flammable Liquids**

Welding or Hot Work on systems that have, or have contained flammable liquids is a high hazard activity that requires consultation and approval from the PESM before any work is begun. Job specific controls will be developed.

The following precautions shall be taken for hot work on systems that contain or contained flammable liquids.

The part of the system being worked on must be isolated from other parts of the system containing flammable liquids or vapors. Isolation may be accomplished by plugging (i.e., using approved procedures and equipment), blanking, or removing from the system. Other approaches must be reviewed by the PESM.

The isolated system must be purged, ventilated, or cleaned before welding, cutting, or brazing may be performed.

Before purging, written calculations must be done to determine the time required to purge a certain size system with a given flow rate of an inert gas.

After ventilation or cleaning a system, a lower explosive limit (LEL) reading must be taken at the area to be worked to ensure that there are no residual flammable vapors before welding or other hot work is conducted. A reading of 10% of the LEL is considered acceptable.

When a part of a system (i.e., a pipe) is worked in place, protection must be accomplished by a combination of blanking-off and purging or blanking-off and cleaning.

#### **3.2.6 Recordkeeping**

Completed Hot Work Permits shall be returned to the PAI and shall be maintained as part of the project file. When hot work was performed on containers that contained flammable materials, information on the purging and measurements will be retained with the hot work permit.

#### **3.2.7 Training**

All persons involved in welding/hot work activities shall receive training on the requirements of this procedure. Training records shall be maintained in accordance with EHS 1-9, Recordkeeping.

### **4.0 GUIDANCE**

The following guidance information is not mandatory unless imposed by a client or project documents.

#### **4.1 Definitions**

**Designated (Hot Work) Area** – A permanent, specific location designed or approved for hot work operations

to be performed regularly (e.g., a maintenance shop or a detached defined outside location that is of noncombustible or fire-resistant construction), that is essentially free of combustible and flammable contents, and is suitably separated from adjacent areas. The Designated Area must be maintained free of combustibles as this area allows hot work at any time. A fire watch is not typically required.

**Fire Watch** – One or more dedicated individuals that observe (direct line of sight) during hot work activities and for a defined period afterwards to protect the Hot Work Operator from injury and to insure that no possibility of fire exists. Fire Watch individuals may have other duties; however the additional duties shall not distract them from their fire watch duties.

**Hot Work** – Hot Work is any temporary or permanent operation involving open flames or producing heat and/or sparks (cutting welding and heating). This includes but is not limited to: brazing, cutting, soldering, grinding, and welding. Hot work can also apply to the use of open flame or other temporary heating devices.

**Hot Work Operator** – An individual who performs hot work who is trained in NFPA 51 B, ANSI Z49.1, requirements, in the use of equipment, and in hot work permit controls,

**Local Exhaust Ventilation** – Local Exhaust Ventilation will consist of freely movable hoods intended to be placed by the welder or burner as close as practicable to the work. The system will be of sufficient capacity and arranged so as to remove fumes and smoke at the source and keep the concentration of them in breathing zone within safe limits.

**Mechanical Ventilation** – Mechanical ventilation consists of either general mechanical ventilation systems or local exhaust systems. General area mechanical ventilation is not generally satisfactory for health hazard control; however it may be helpful when used in addition to Local Exhaust system.

**Natural Ventilation** – Natural Ventilation is acceptable for welding, cutting and related processes where necessary precautions are taken to keep the operators breathing zone away from smoke, Fumes and gases and where sampling of the atmosphere shows that the concentration of contaminates are below the allowable limits (OSHA and in some cases ACGIH recommendations). It includes avoiding fumes and gases by positioning of the work, the head, or by ventilation that captures or directs the fumes away from the face of the operator.

**Permit Authorizing Individual (PAI)** – An individual that has the experience and training to evaluate an activity for hazards designated by management.

**Soldering/Brazing** – Methods of joining metal by use of a filler metal. Soldering is defined as using filler with a liquidus not exceeding 840 degrees F. Brazing is performed at 840 degrees or greater, but both are below the melting temperature of the base metals.

**Task-Specific Hot Work Area** – Hot work that is performed outside of a Designated Area and for a specific task that is made fire safe by removing or protecting combustibles from ignition sources. Hot Work Permits are required for Task Specific hot work and are valid for one shift only. Fire watches are typically required.

**Thermite (Exothermic) Welding** - A process using finely powdered aluminum and iron oxide with other alloys (manganese, carbon, nickel, vanadium, chrome and others) to generate high heats and liquefy metals in a crucible. The liquid metal (iron, copper, etc) is then flowed into place with a form around the joint. Examples of materials typically joined include: copper grounding, railroad rails, reinforcing steel. Preheating of materials to 1000 degrees F is accomplished by use of a gas torch.

## 4.2 Background

The minimum requirements of this procedure are derived from OSHA 29 CFR 1926, 350 (Subpart J- Welding and Cutting). ANSI Z49.1 and NFPA 51B are often cited contractually. The additional requirements of these standards are contained in Section 4 Guidance. When these standards are imposed, the optional items in guidance become mandatory. When a Hot Work Permit is required, Attachment C (Hot Work Permit Example Form (NFPA 51B Compliant) should be used in these cases.

Hot Work performed in radiological areas or on radiologically contaminated materials will be controlled by the radiological work permits and this procedure.

### 4.3 Training

Personnel performing hot work under ANSI Z49.1 and/or NFPA 51B will receive training on the content of those standards, along with this procedure.

### 4.4 Postings

Proper postings for noise, fumes, electrical shock are to be in place (posted at entrances or on equipment or consumables containers). If the equipment or consumable do not already contain precautionary information labels, the appropriate warning postings should be made, (Refer to the Figure 1 thru 4 in ANSI Z49.1 for content).

### 4.5 Hazard Analysis & PPE

An Activity Hazard Analysis will be conducted specifically for the welding, cutting or heating operation that will be performed. All required respiratory, eye, face, noise, head, foot, and skin protection equipment will be selected and shown on the AHA. Suitable fire extinguishing equipment of sufficient capacity will be provided in the immediate vicinity of hot work operations and maintained in a state of constant readiness. Material Safety Data Sheets (MSDS) should be available and reviewed as a part of the AHA process.

### 4.6 Fumes & Ventilation

Fumes and gases from hot work cannot be simply classified. The composition and quantity of fumes and gases are dependent upon the metal being worked, the process and consumables being used, coatings on the work, such as paint, galvanizing, or plating, and contaminants in the atmosphere. In welding and cutting, the composition of the fumes is usually different from the composition of the electrode or consumables. The determination of adequate ventilation is to sample the atmosphere that the workers are exposed to in accordance with the project Industrial Hygiene Plan.

ANSI Z49.1 and USACOE EM-385-1-1 includes materials of toxic significance and requires additional levels of ventilation, air monitoring or respiratory protection as shown in Table 4.6-1.

**Table 4.6-1 Categories and Ventilation/Respiratory Protection (EM 385-1-1 & ANSI Z-49.1)\***

Hot Work Type <sup>1</sup>	Type of Ventilation or Respiratory Protection Required*
<p><b><u>In Any Enclosed Space</u></b>                      Antimony, Arsenic, Barium, Cadmium, Chromium, Chromium V<sup>2</sup>, Cobalt, Copper, Lead, Manganese, Mercury, Nickel, Ozone, Selenium, Silver, and Vanadium</p>	Local exhaust ventilation
<p><b><u>Confined Spaces- Hot work Involving</u></b>                      - Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Chromium IV<sup>2</sup>, Cobalt, Copper, Lead, Manganese, Mercury, Nickel, Ozone, Selenium, Silver, and Vanadium</p>	Local exhaust ventilation vented outside the confined space <b>and</b> personnel respiratory protection required.
<p><b><u>Confined Spaces – Hot Work Involving:</u></b>                      - Fluorine gases                      - Zinc compounds</p>	Local exhaust ventilation vented outside the confined space <b>OR</b> personnel respiratory protection required.
<p><b><u>Open Areas (Outside) involving</u></b>                      Antimony, Arsenic, Barium, Cadmium, Chromium, Chromium IV<sup>2</sup>, Cobalt, Copper, Lead, Manganese, Mercury, Nickel, Ozone, Selenium, Silver, and Vanadium</p>	Respiratory Protection required as well as engineering controls based on results of worker exposure assessment and exposure determination.
<p><b><u>Open Areas (Outside) Involving</u></b></p>	Sampling to be performed to determine the need for

- Fluorine gases
- Zinc compounds

respiratory protection or local exhaust.

**General Welding, Cutting & Heating**

- Oxygen cutting using iron powder or chemical flux
- Gas Shielded Arc Cutting
- Plasma Cutting

Local mechanical ventilation or other means to remove fumes generated.

*\* Any other employees exposed to the same atmosphere will be protected in the same manner as the welder or cutter.*

**1** Workers may be exposed to hazardous concentrations of Chromium (IV) while welding, cutting or performing hot work on stainless steel, high chrome alloys or chrome-coated metal, or during the application and removal of chromate-containing paints and other surface coatings.

**2** When gas metal arch welding is performed on stainless steel, chrome alloy steel or chrome plated steel, personnel shall be protected by means of a local exhaust capable of maintaining exposures within permitted limits, or by other work and engineering controls, such as the use of argon-rich (>75% argon) shielding gas for use in gas metal arch welding (GMAW) or flux cored arc welding (FCAW). Whenever engineering and work controls are not sufficient reduce employee exposures, they will be supplemented by use of respiratory protection.

Where concentrations of airborne fume contaminants are to be determined by sampling of the atmosphere, the sampling will be conducted inside the welding helmet in the welding operators breathing zone.

**4.7 Daily Inspections**

Hot work operators and fire watches will inspect their welding, cutting and heating equipment and personal protective equipment daily prior to use. The PAI will inspect Designated and Task Specific Hot Work Areas on a regular basis. Attachment B (Hot Work Precautions Checklist) is provided to assist in these inspections.

**4.8 Thermite Welding**

Thermite welding work will be controlled with a hot work permit when performed within 35 feet of any combustible materials. A fire watch will be maintained during the preheating and thermite welding for 30 minutes after the weld is completed. In areas without combustibles, the PAI may authorize thermite work as a Designated Area. Thermite powders and igniters will be stored separately and away from the work.

**4.9 Soldering/Brazing**

Soldering using flame heating devices and brazing will be controlled in accordance with ANSI Z49.1 for personnel protection. A fire watch will be maintained during and for 30 minutes after the completion of the soldering or brazing activity. Solder and brazing filler materials may contain lead, silver, tin, cadmium, and other metals.

**5.0 REFERENCES**

**Please Describe Your Reference Here**

1. OSHA 29 CFR 1926, Subpart J- Welding & Cutting
2. OSHA 29 CFR 1926, Subpart F - Fire Protection & Prevention
3. 29 CFR 1926, 1126 (Subpart Z)
4. EHS 1-9, Recordkeeping
5. EHS 6-1, Confined Space Entry
6. ANSI Z49.1 Safety in Welding, Cutting and Allied Processes (2005)
  
7. EHS 5-2, Respiratory Protection
8. NFPA 51B Standard for Fire Prevention During Welding, Cutting and Other Hot Work (2003)
9. USACOE EM-385-1-1 (2008) Section 10 Welding & Cutting (note requires AWS Z49.1
  
10. DOE Work Safety & Health Rule 10 CFR 851
11. American Conference of Governmental Industrial Hygienists TLV and BEIs
12. Cooper Tube Handbook

**Place Your Link In This Column**

<http://www.OSHA.gov/>  
<http://www.OSHA.gov/>  
<http://www.OSHA.gov/>

[http://www.aws.org/w/a/survey/standa\\_survey\\_start=z49\\_reqpdf](http://www.aws.org/w/a/survey/standa_survey_start=z49_reqpdf)

**Via Engineering Links**

<http://www.usace.army.mil/publications/eng-ma85-1-1/toc.htm>  
<http://www.wipp.energy.gov/proc/pdf/851%20R>

<http://tubebook.copper.org/publications>

## 6.0 ATTACHMENTS

**ep Please Provide a Description of the Attachment**

- A. Hot Work Permit Example Form
  
- B. Hot Work Precautions Checklist
  
- C. Hot Work Permit Example Form (NFPA 51B Compliant)

**Place Your Attachments Here**



EHS 6-5 Attachment A - HW Permit 12-9-08.doc



EHS 6-5 Attachment B HW Precautions Checklist 12-9-08.doc



EHS 6-5 Attachment C - HW PERMIT NFPA Compliant-12-9-08.doc

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Proprietary Information



HOT WORK PERMIT

- Task Specific Area Permit
- Designated Area Permit

Permit No. \_\_\_\_\_

Site Name: _____
Site Location: _____

Permit Issue Date: \_\_\_\_\_ Permit Expiration Date: \_\_\_\_\_

Describe work to be performed, location where activity will be performed, and the processes to be used:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**SAFETY ZONE** for work established by (check all that apply)

- Cones
- Caution Tape
- Natural Barrier
- Welding Screen
- Building
- Other, explain: \_\_\_\_\_

**SAFETY REQUIREMENTS** (check YES or NO)

- |   |                              |                             |                    |                              |                             |
|---|------------------------------|-----------------------------|--------------------|------------------------------|-----------------------------|
| Fire Extinguisher properly rated                                    | <input type="checkbox"/> YES | <input type="checkbox"/> NO | Fire watch present | <input type="checkbox"/> YES | <input type="checkbox"/> NO |
| Combustibles covered within 35 ft                                   | <input type="checkbox"/> YES | <input type="checkbox"/> NO | Work area clean    | <input type="checkbox"/> YES | <input type="checkbox"/> NO |
| Cables, hose lines, regulators, cylinders, electric sources checked | <input type="checkbox"/> YES | <input type="checkbox"/> NO |                    |                              |                             |

**SAFETY EQUIPMENT** (check all that apply)  respirator  welders mask  burning goggles

face shield,  local exhaust ventilation, and: \_\_\_\_\_

Are **SPECIAL FIRE PROTECTION** procedures being implemented? (If yes, describe): \_\_\_\_\_

**Refer to the Industrial Hygiene Plan for any air monitoring requirements.**

PAI Name: _____	Signature/ Date/Time _____
Hot Work Operator _____	Signature/Date/Time _____
Air Monitor Name _____	Signature/Date/Time _____
Fire Watch Name _____	Signature/Date/Time _____

**Attachment B - Hot Work Precautions Checklist**

**Hot Work Precautions Checklist**

<u>Yes</u>	<u>NO</u>	<u>NA</u>	<u>General</u>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Before initiating Hot Work, ensure that precautions are in place and an appropriate fire extinguisher is readily available.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are available sprinklers, hose streams and extinguishers in service and operable?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is Hot Work Equipment in good repair?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If area is protected by smoke detectors, are they bypassed, covered or removed?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is a confined space permit required?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is there adequate ventilation to remove smoke or vapor from the work area?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is a lockout/Tagout required?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are noncombustible screens or shields in place to protect other persons in the vicinity from the direct rays of arc welding or cutting, sparks, slag or splatter?
			<b><u>Within 35 feet of the Work</u></b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Have flammable liquids, dust, lint and oil deposits been removed?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Have sources of explosive atmospheres in the areas been eliminated?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Have the floors been swept clean?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Have combustible floors been wet down, covered with damp sand, or fire resistant sheets?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Have other combustibles been removed where possible or otherwise protected with fire-resistant materials or metal shields?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are all wall, floor, duct, or tank openings covered or blocked?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are fire resistant tarps suspended beneath work?
			<b><u>Work on Walls or Ceilings/Enclosed Equipment</u></b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is construction noncombustible and without combustible covering or insulation?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Have Combustibles on other side of walls been moved?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is there a danger from the conduction of heat into another area?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is enclosed equipment cleaned of all combustibles
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Have containers been purged of flammable liquids/vapors?
			<b><u>Fire Watch/Hot Work Area Monitoring</u></b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is a fire watch to be provided during and for 30 minutes after work is completed, including any breaks?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the fire watch supplied with suitable extinguishers?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the Fire Watch trained in the use of the extinguishers and in sounding fire alarm?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are Fire Watches available for adjoining areas, areas below or above?

**Attachment C Hot Work Permit (NFPA Compliant)**

 <b>TETRA TECH EC, INC.</b>	<h2 style="margin: 0;">Hot Work Permit</h2>
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**BEFORE INITIATING HOT WORK, ENSURE PRECAUTIONS ARE IN PLACE!  
MAKE SURE AN APPROPRIATE FIRE EXTINGUISHER IS READILY AVAILABLE!**

This Hot Work Permit is required for any operation involving open flames or producing heat and/or sparks. This includes, but is not limited to: Brazing, Cutting, Grinding, Soldering, Thawing Pipe, Torch-Applied Roofing, and thermite welding.

<p align="center"><b>INSTRUCTIONS</b></p> <ul style="list-style-type: none"> <li>• Verify precautions checked at right are in place, or do not proceed with the work.</li> <li>• Complete and retain a copy of this permit (provide original to the PAI when the permit is closed).</li> </ul>	<p><b>Required Precautions Checklist</b> (Check appropriate box)</p> <p>YES NO NA</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Available sprinklers, hose streams, or extinguishers are in service and operable.</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Hot work equipment in good repair.</p> <p><b>Requirements within 35 feet of hot work</b></p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Flammable liquids, dust, lint, and oil deposits removed?</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Explosive atmosphere in area eliminated.</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Floors swept clean.</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Combustible floors wet down, covered with damp sand or fire-resistant sheets.</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Remove other combustibles where possible. Otherwise protect with fire-resistant tarpaulins or metal shields.</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> All wall and floor openings covered.</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Fire-resistant tarpaulins suspended beneath work.</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Vegetation removed or wet down.</p> <p><b>Work on walls or ceilings/enclosed equipment</b></p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Construction is noncombustible and without combustible covering or insulation.</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Combustibles on other side of walls moved away.</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Danger exists by conduction of heat into another area.</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Enclosed equipment cleaned of all combustibles.</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Containers purged of flammable liquids/vapors.</p> <p><b>Fire watch/hot work area monitoring</b></p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Fire watch will be provided during and for 30 minutes after work, including any coffee or lunch breaks.</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Fire watch is supplied with suitable extinguishers.</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Fire watch is trained in use of this equipment and in sounding alarm.</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Fire watch may be required for adjoining areas, above and below.</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Fire Watch waived (reason) _____</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Notify the Health and Safety representative after hot work is complete.</p>
<p>WORK TYPE:</p> <p><input type="checkbox"/> Cutting      <input type="checkbox"/> Welding      <input type="checkbox"/> Other</p> <p>DATE: _____ PERMIT NO.: _____</p> <p>LOCATION: _____</p> <p>NATURE OF JOB: _____</p> <p>NAME OF PERSON DOING HOT WORK: _____</p> <p>COMPANY NAME: _____</p> <p>I verify the above location has been examined and the precautions checked on the Required Precautions Checklist have been taken to prevent fire.</p> <p><b>RESPONSIBLE SUPERVISOR:</b></p> <p>NAME (Printed) _____</p> <p>SIGNATURE: _____</p> <p>START TIME: _____ FINISH TIME: _____</p> <p><b>ASSIGNED FIRE WATCH:</b></p> <p>NAME: _____</p> <p>SIGNATURE: _____</p> <p><b>Permit Authorizing Individual:</b></p> <p>NAME: _____</p> <p>I verify that the location was inspected and determined to be fire safe and that the precautions checked on the Required Precautions Checklist are in place. Permission is authorized to start work.</p> <p>SIGNATURE: _____</p> <p align="center"><b>THIS PERMIT IS GOOD FOR ONE DAY OR UNTIL EXPIRATION DATE AS NOTED</b></p>	<p><b>REPORT EMERGENCIES BY DIALING 911 ON ANY SITE, COMPANY, OR CELL PHONE</b></p> <p>I verify that I conducted an inspection 30 minutes following completion of hot work and the area was in a fire safe condition.</p> <p>NAME: _____</p> <p>SIGNATURE: _____</p>
<p>Fire Watch Completed: _____</p> <p>DATE: _____ TIME: _____ AM/PM</p> <p><b>Required Personal Protective Equipment (PPE):</b></p> <p>_____</p>	

**Purpose:** The purpose of this procedure is to identify minimum requirements, and to provide guidance to Tetra Tech EC, Inc. (TtEC) project personnel concerning the management of construction tools and equipment on a construction project incorporating the Corporate operating principles of 'Do It Right

®  
, 'Client Service Quality  
®  
, and 'Shared Vision  
SM  
'.

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- 1.0 PURPOSE
- 2.0 SCOPE
- 3.0 MINIMUM REQUIREMENTS
  - 3.1 DEFINITIONS
  - 3.2 ROLES & RESPONSIBILITIES
  - 3.3 SAFE OPERATION REQUIREMENTS FOR TOOLS
- 4.0 GUIDANCE
  - 4.1 ADDITIONAL CONSIDERATIONS
- 5.0 REFERENCES
- 6.0 ATTACHMENTS

The purpose of this procedure is to identify minimum requirements, and to provide guidance to Tetra Tech EC, Inc. (TtEC) project personnel concerning the management of construction tools and equipment on a construction project incorporating the Corporate operating principles of 'Do It Right<sup>®</sup>', 'Client Service Quality<sup>®</sup>', and 'Shared Vision<sup>SM</sup>'.

This procedure applies to all TtEC projects that include a construction, O&M, and/or UXO component, including remediation construction.

### **3.1 Definitions**

#### **3.1.1 Construction Equipment**

For the purposes of this procedure, construction equipment shall mean heavy equipment, such as excavators, scrapers, off-road trucks, dozers, road graders, compactors, dredges, and cranes; light equipment, such as skid-steers, forklifts, generators, and light plants; and operating systems such as screens, crushers, conveyors, pugmills, mobile treatment plants, and pumps. Any discussion of construction equipment shall be understood not to include cars, pickup trucks, flatbed trucks, etc. registered for use on public roadways, which shall be called vehicles hereinafter. Also for the purposes of this procedure, construction equipment shall be synonymous with Contractor's Equipment, a term also commonly used in the construction industry to designate the types of equipment described above.

#### **3.1.2 Terms**

The terms "should, may, and might" as used in statements in this procedure are intended to denote a discretionary consideration; the terms "shall & must" are intended to impose a mandatory requirement. The terms "is, are, & will" as used in statements in this procedure are intended to denote discretionary or mandatory requirements that are addressed in other department/disciplines' procedures. However, nothing contained herein should be interpreted as to prohibit development and approval of project-specific procedures or plans that take exception to mandatory direction presented in this procedure provided that the appropriate level of approval (Executive Vice President of Construction, Business Line Executive Vice President, or the Vice President ESQ Services as appropriate) is obtained for deviations from such requirements.

#### **3.1.3 Tools of the Trade**

Specific hand tools and or equipment (e.g., manlifts, trucks, trenchers, and pumps) normally provided by or to workers for the performance of their particular work activity.

### **3.2 Roles & Responsibilities**

#### **3.2.1 Equipment Supervisor**

Depending on the project's equipment needs, an individual may be designated as the Equipment Supervisor. Responsibilities of the Equipment Supervisor include:

- Determination of the equipment needs for the project;
- Providing input to the Work Plan concerning equipment;
- Identification of Contract and legal/regulatory requirements for mobilization of equipment on client facilities;
- Submittal of required certifications, inspection reports, and test reports for equipment;
- Arranging for the mobilization/demobilization of equipment in support of the project's schedule, providing required notices, such as mobilization details and dates, and obtaining Contractual or legally required approvals for mobilization;

- Receipt inspection of equipment arriving at the site, including coordination of any client or third party inspection;
  - Coordination with equipment yard personnel or vendors regarding equipment maintenance;
  - Ensuring implementation of safe work practices for equipment utilization; and
- Assuring that the return of demobilized equipment is performed in accordance with the terms of the rental/lease/PO agreement and documented correctly, or, for TtEC owned equipment, that the equipment transfer form is completed and coordinated with the Equipment Manager; and
- All other responsibilities as assigned by the Project Manager or Site Superintendent.

### **3.3 Safe Operation Requirements for Tools**

#### **3.3.1 Manual T-Post Drivers**

There shall be no use of manual fence post drivers, such as those typically used to drive T-posts, without prior approval from the Project Environmental Safety Manager (PESM) or the Vice President of Construction. Any approval of the use of such a tool shall require the implementation of an Activity Hazard Analysis (AHA) to identify and control the hazards presented by the tool. The AHA shall address appropriate PPE and position for the task in order to avoid injury to the worker.

#### **3.3.2 Tools**

The Site Superintendent shall determine the nature and quantity of tools required for the construction effort and shall ensure that adequate tools are provided in support of the schedule.

Tools may be assigned to workers or crews for the duration of their activities and shall be stored in gang boxes or other secured storage areas when not in use.

The Site Superintendent may designate certain tools to be issued from a tool control area on a daily basis. These tools should be signed out at the beginning of the work, returned to the tool control area at the end of the work, and signed back in.

#### **3.3.3 Worker Provided Personal Tools**

Workers may be required to provide personal tools of the trade for their particular work. Master mechanics, for example, may be required to provide tools required for repairs and maintenance of construction equipment and vehicles. Requirements for workers to provide their own tools shall be established based on the project requirements and shall be discussed at the Pre-Job Conference to be held in accordance with the requirements of the Labor Relations Guidelines LR-8, Pre-Job Conferences.

Any worker required or offering to provide personal tools shall be required to present a list of personal tools being provided upon reporting to the project site. The Site Superintendent shall inventory the tools against this list for verification that all listed tools have been provided. The list shall then be maintained for use in performing an inventory of the tools when the worker is to leave the site at the end of the worker's assignment and shall be the basis for any claims for loss or damage.

The Site Superintendent shall ensure that any personal tools brought onto the project site receive a safety inspection. The safety inspection shall include as a minimum, the items addressed in Section 3.3.4 of this procedure.

The Site Superintendent should ensure that secure, lockable facilities are provided for the storage of worker provided personal tools.

The worker shall be responsible for notification of lost or damaged tools immediately on discovery of the loss. The limits of the project's liability (if any) for loss or damage to personal tools provided by the workers should be established at the Pre-Job Conference.

Use of personal tools, other than addressed above, either by manual or by TtEC nonmanual personnel, should not be allowed except as specifically authorized by the Project Manager or Site Superintendent. Project personnel should be notified that TtEC will not be liable for any theft, loss, or damage of unauthorized personal tools on the project site.

#### **3.3.4 Tool Safety Inspection**

OSHA 29 CFR Part 1926 Subpart I Tools – Hand and Power provides guidance for tool safety. All tools shall be inspected for the following minimum features by the person using the tool prior to starting the work:

- Proper general condition of tools, electrical cords, and air hoses;
- Presence and serviceability of guards and safety devices;
- Proper electrical grounding or double insulation protection;
- Power tools properly equipped with constant pressure switches;
- Tool retainers installed on pneumatic tools;
- Proper adjustment of the tool; and
- Confirming that the load rating of the tool is sufficient for the work to be performed.

Unsafe tools shall be removed from service and the Site Superintendent advised of the condition for corrective action. An Out of Service tag should be placed on all unsafe or defective tools to prevent their inadvertent use by others. These tools should be physically segregated from the acceptable tools.

#### **3.3.5 Environmental Safety and Quality Policy Implementation**

TtEC's Environmental Safety and Quality (ESQ) Policy, as included in Environmental Management System (EMS), shall be considered in the selection and utilization of construction equipment and vehicles for use in association with TtEC's construction projects.

Selection of the construction equipment and vehicles shall consider relevant TtEC-wide and project-specific significant environmental aspects, objectives, and targets, as defined in EMS and as identified by the Project Manager in the project management planning documents required under Project Initiations/Operations Procedure, PO-1, Project Management Planning.

Selection of construction equipment and vehicles may have significant impacts on the environment, either adverse or beneficial. Proper selection of the size and type of equipment and vehicles can reduce the adverse impacts from their operation.

Project procurement practices for construction equipment, parts, supplies, lubricants, and fuel shall be consistent with the principles of pollution prevention as discussed in the EMS and identified through the TIP process using CRL Procedure PO-2, Task Initiation. (For example, consideration should be given to such factors as rent versus buy options, disposable versus reusable filters, recycled versus virgin oils/fluids, recycling versus disposal of spent fluids and used parts, and fuel efficiency and economy of operation.)

Spent fluids, filters, and used parts shall be recycled to the extent practical, or otherwise disposed of in accordance with the environmental compliance elements of the Work Plan or EHS plan.

Proper utilization of construction equipment and vehicles can also reduce adverse impacts on the environment. (For example, it is TtEC's policy to not allow unattended equipment and vehicles to be left with motors running. This is not only a safety consideration; it reduces adverse environmental impacts and is generally cost effective due to reduced fuel consumption.)

#### **3.3.6 Insurance**

The Project Manager shall ensure that all construction equipment, including TtEC-owned or rental/lease

equipment, is covered by appropriate insurance policies for the intended use of the equipment. Property insurance on construction equipment is normally arranged by TtEC if TtEC bears the risk of loss or if TtEC is required to arrange such insurance. However, all rented/leased construction equipment valued in excess of \$100,000, and all cranes regardless of their value shall be reported to the Administration and Compliance Department via the 'Insurance Request for Leased Equipment' (Attachment 5, and available in Tetra Links and from procurement) for specific inclusion under the TtEC property insurance policy. The procurement representative should be contacted to ensure that this occurs in each case. Notification is not required for equipment valued under \$100,000 except when the construction equipment provider requests a certificate of insurance be provided, or the equipment is a crane.

The Project Manager, usually through the designated procurement representative, should ensure that duplicate insurance coverage is not provided through the equipment provider since this will increase the rental rates. In those cases where the provider requires insurance certificates to verify coverage by TtEC, the procurement representative should be contacted to obtain the appropriate documentation.

A Vehicle Insurance Form (available from the Vehicle Insurance Coordinator, Tetra Links or procurement) shall be processed and sent to the Vehicle Insurance Coordinator for all vehicles (leased, rented, or owned) which are registered and operated off jobsites on public highways.

### **3.3.7 Receipt and Inspection**

All construction equipment shall be subject to a receipt inspection by a competent person and any Contract or otherwise required additional person(s) prior to acceptance at the project site. The inspections and tests shall be in accordance with the manufacturer's recommendations. Most vendors provide a form for notation of any existing damage to the equipment to be filled out on receipt. The equipment should be inspected carefully to determine its condition, including any damage, missing or non-functional equipment. The agreement should be used as a basis to determine that everything required (e.g., the equipment, its condition, manuals, spares, documentation of inspections, and certifications) has been provided. All discrepancies should be noted on the form. A pre-inspection of the equipment prior to transport to the Project site should be considered. Particular attention shall be given to the following items:

- All safety equipment and its condition;
- Operator (when provided) certification for the equipment;
- Posted operating and safety instructions;
- All pollution control devices and their condition;
- Safe entry and egress, with steps, ladders, handholds, and platforms provided as required, including safe access to perform routine checks, maintenance, and refueling operations;
- Leaking fluids, such as hydraulic oil, engine oil, transmission fluid, and coolant;
- Deteriorated or cracked hydraulic and coolant hoses which could result in leaks or spills; and
- Presence of the manufacturer operation and maintenance manual.

Equipment or vehicles with deficient conditions relating to safety or protection of the environment shall not be placed into service until the deficiencies have been corrected and documented.

All construction equipment shall be subject to an operational check prior to acceptance at the project site. The operational check should verify that the equipment has the capability to function as intended or as required through the full range of its intended use.

Receipt of construction equipment shall be documented; with a copy of the receipt inspection report provided to the Equipment Supervisor and to the equipment purchase order file. Documentation should include entries for date and time of receipt, condition of equipment, mileage or engine hours at time of receipt, information on next scheduled maintenance, and a record of operating and maintenance manuals received

with the equipment. Photographs or a video record of the equipment on receipt should be taken if conditions are noted that would warrant further documentation.

Construction equipment providers will often include terms and conditions on receipt documentation to be signed when construction equipment is delivered to the project site. **Project personnel requested to sign this receipt documentation shall not sign any delivery forms unless authorized to do so by Legal of the Project Manager. Further, if they are required to sign delivery forms, they shall be instructed to cross out all terms and conditions, on both the front and back of the forms, before signing.** Alternately, the person receiving the construction equipment should enter the following statement in the immediate vicinity of their signature: "In lieu of the terms and conditions set forth on this document, the Original Purchase Order (or appropriate form of agreement) terms and conditions apply to the receipt of this item(s)." These actions are necessary to avoid acceptance of additional or different terms and conditions.

Construction equipment delivered to the project site should be accompanied with operating and maintenance manuals. Cranes and lifting equipment shall include certification of satisfactory completion of annual inspection and have load charts posted in the cab. Additionally, some construction equipment may be supplied with common replacement parts, such as filters and belts, and any specialized tools required for routine operation or maintenance. (i.e. forks, buckets, lift arms, and tool carries) These items should be carefully inventoried upon receipt, and documented on the receipt inspection report. Responsibility for protection and maintenance of the construction equipment shall be verified, and all measures necessary to protect the construction equipment from damage or loss will be instituted in accordance with the agreement, operating, and maintenance manuals or other instructions as appropriate.

Disposition requirements for construction equipment found to not be in accordance with the rental/lease/sale agreement when received shall be confirmed with the vendor immediately.

A sample Equipment/Vehicle Inspection Report is included as Attachment 1 to this procedure.

### **3.3.8 Protection from Environmental Extremes**

Consideration shall be given to the environmental conditions to which the construction equipment will be exposed to during its time at the project site or during transportation. The manufacturer's instructions shall be reviewed and followed to ensure adequate protection from damage due to environmental conditions.

Adequate protection to the construction equipment's cooling system shall be verified by ensuring that the appropriate coolant/antifreeze mixture, as recommended by the manufacturer, has been used.

Appropriate procedures for operating or storing construction equipment, such as water treatment systems, shall be developed in accordance with the manufacturer's instructions. Measures such as draining and venting the system, providing auxiliary heat sources (e.g., heat tape), dry storage, shaft rotation, fluid levels, shall be taken to protect construction equipment subject to damage from environmental conditions.

Manufacturer's instructions concerning periodic operation of construction equipment shall be followed.

A means of ensuring that appropriate protective measures are instituted and performed as required should be implemented through the establishment of site procedures, logs, and/or checklists.

### **3.3.9 Equipment Inspections**

All construction equipment shall be inspected daily (when in use) for safety and operability, including manufacturer's recommended daily inspections. The inspection form/checklist should note any deficiencies for correction and serve as documentation of the inspection performance. The Equipment Supervisor shall be notified of any deficiency immediately. A Daily Equipment Inspection form, a sample of which is included as Attachment 2 to this procedure, should be filled out at the start of the shift and provided to the Equipment Supervisor. [Other supplemental forms which may be used in conjunction with Attachment 2 are the equipment specific "Pre-operation Inspection" and/or "Function Tests" forms, which are normally supplied by the equipment manufacturer. This information is usually found in the equipment's Operation Manual.](#)

Government property control procedures usually require the implementation of a vehicle utilization log for vehicles when used on government projects; other projects should also implement a similar system for logging use of these vehicles. The log should be kept in the vehicle and an entry made for each use, including name of the driver, purpose of the trip, starting mileage, ending mileage, fuel purchased, maintenance performed, and any damage incurred. The log sheets should be transmitted as required in the contract documents and the project's documentation plan. Copies of the log sheets will be maintained and filed as discussed in Section 3.3.12 of this procedure.

A separate Daily Equipment Inspection Report should be filled out for each shift if construction equipment is utilized on multiple shifts.

The Equipment Supervisor should use the information on Daily Equipment Inspection forms to schedule any repairs or preventive maintenance required for the equipment. Equipment with missing or defective safety features should not be put in service until repairs have been performed to bring the equipment into compliance with any applicable TtEC EHS Program and/or regulatory requirements.

Implementation of the daily equipment inspections should be the subject of periodic verification inspections performed by the Project Manager, Site Superintendent, and/or the Environmental and Safety Supervisor (ESS). These periodic inspections should include verification that the required maintenance is being performed in a timely manner to ensure that unsafe conditions or impacts to the environment (e.g., spills, releases, and discharges) are not created by delays in correcting deficiencies noted on the Daily Equipment Inspection Forms.

Rigging equipment, wire rope, nylon or KEVLAR slings and chokers shall be inspected by a competent person prior to use each shift; particular attention shall be paid to the rigging condition and presence of load/certification tags.

Cranes (weight handling equipment) shall be subjected to annual and certification inspections per OSHA guidelines. Mobile and crawler cranes shall be inspected on a monthly basis; a sample checklist form is included as Attachment 3 to this procedure.

Construction equipment to be demobilized shall be given a final inspection, similar to the receipt inspection, to identify and document, by means of written description and pictures, the condition of the equipment as it leaves the project site. Where possible, a concurrent inspection by the vendor is preferred. Additionally, some projects, particularly USACE projects, require a certificate of decontamination prior to the equipment leaving the site.

### **3.3.10 Operator Qualifications**

TtEC employees operating vehicles or construction equipment on public rights of way shall be required to have in their possession a valid driver's license appropriate to the location where the item is being operated and containing the appropriate endorsement for the type of vehicle or construction equipment being operated. A Commercial Driver's License (CDL) may be required for operation of some construction equipment on public rights of way, or as a specific requirement of a client's safety program. In addition, individual states may require specific licenses or certifications for operators of certain equipment, such as forklifts, and hoisting equipment. Additionally, the client's safety program may include license or certification requirements for personnel operating equipment on their property. The contract documents should be reviewed carefully to ensure that any such requirements are incorporated into the project's Work Plan or EHS Plan. The Site Superintendent shall verify that the operator possesses the required license(s). Copies of licenses should be maintained in the on-site project employee file.

Any agreements for the rental or lease of vehicles or equipment should be reviewed for any provider's requirements for licensing or certification of operators to ensure that any such requirements are incorporated into the project's Work Plan or EHS Plan.

Operators shall be required to demonstrate their proficiency in operating the construction equipment to be assigned to them prior to being allowed to work. Crane operators shall have qualifications for the type of crane to be operated.

Operator proficiency may be demonstrated through a performance test such as those developed by the International Union of Operating Engineers, or by equipment manufacturers such as Caterpillar. These performance tests include exercises developed to demonstrate operator proficiency in various aspects of equipment operation, including daily operator inspections, ability to follow directions, ability to understand equipment limitations and operating guidelines, safety, and productivity. Also included are checklists that assist an observer in evaluating all of the various aspects of equipment operation. Attachment 4 is an example of Operator/Driver Observation Checklist.

Where it is not possible or practical to demonstrate operator proficiency through a performance test as described above, there should be a period of observation of the operator during the initial period of performance, whether the operator is a new employee or a current employee who is being assigned to a different type of equipment than previously operated on the project site. This observation may be performed by a knowledgeable member of the management team or a designated craft employee such as a foreman or steward. The above referenced checklists could be used for this observation in lieu of the performance test.

### **3.3.11 Refresher Training and Evaluation**

Refresher training in relevant topics shall be provided to Crane (as defined by OSHA 1910.180(a) operators, and Powered Industrial Truck (PIT) as defined by OSHA 1910.178(a)(1) operators prior to be allowed to continue operating when:

- The operator has been observed to operate the PIT/Crane in an unsafe manner.
- The operator has been involved in an accident or near-miss incident.
- The operator has received an evaluation that reveals that the operator is not operating the PIT/Crane safely.
- The operator is assigned to operate a different type of PIT/Crane; or
- A condition in the workplace changes in a manner that could affect safe operation of the PIT/Crane.

An evaluation of each PIT/Crane operator's performance shall be conducted at least once every three years.

Refresher training in relevant topics shall be provided to all other construction equipment operators when:

- The operator has been observed to operate the equipment in an unsafe manner.
- The operator has been involved in an accident or near-miss incident.
- The operator has received an evaluation that reveals that the operator is not operating the equipment safely.
- The operator is assigned to drive a different type of equipment; or
- A condition in the workplace changes in a manner that could affect safe operation of the equipment.

The employer shall certify that each operator has been trained and evaluated. The certification shall include the name of the operator, the type of equipment, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation.

### **3.3.12 Repairs**

All construction equipment shall be repaired as necessary and maintained in good working order. Repairs to rented/leased construction equipment shall be in accordance with the terms of the rental/lease agreement. Repairs to rented/leased and TtEC's construction equipment shall be documented and a record of the repairs maintained in the project files. Copies of the repair records are to be forwarded to the equipment yard for TtEC-owned equipment.

Construction equipment with deficiencies noted on the Daily Inspection Report should be repaired promptly. The Equipment Supervisor, with input from the Environmental and Safety Supervisor as appropriate, should evaluate if a piece of equipment or a vehicle should be removed from service until the deficiency is corrected.

Construction equipment that develops a fluid leak such as engine oil, hydraulic oil, transmission fluid, or coolant shall be removed from service until the deficient condition has been corrected.

Construction equipment with missing or inoperable exhaust systems, including spark or flame arrestors, mufflers, and catalytic converters, shall be removed from service until the deficient condition has been corrected.

Tampering with, removal, modification, or otherwise rendering inoperable any pollution control device on construction equipment shall not be allowed except as specifically authorized by the equipment manufacturer or appropriate authority and the Project Manager or Superintendent's concurrence

Only trained, qualified personnel shall be allowed to repair equipment. The project's Work Plan should address repairs to equipment by designating required actions in the event of an equipment failure.

An Authorization for Capital Expenditure or Lease (AFCEL) is to be completed for all major repair work (i.e., \$1500.00 and over) performed on TtEC-owned construction equipment in accordance with Accounting/Finance Procedure AF-8, Fixed Assets. (Note that on some construction equipment, the cost of a specific item, a replacement tire for example, may require the processing of an AFCEL due to the item cost.)

Costs for major repairs, as well as repairs for deficiencies, to TtEC-owned construction equipment shall be charged back to the project releasing the equipment if the need for repairs is identified within 30 days of the equipment's release and removal from a project and there are indications that the repairs are needed as the result of lack of maintenance or failure of the releasing project to otherwise keep the equipment in good working order.

No repair shall be undertaken for damage covered by an insurance claim until the damage is reported to the Administration and Compliance Department and the insurer approves the repairs.

### **3.3.13 Documentation and Record Keeping**

A file shall be established and maintained for each operator which contains documentation that the operator has the proper qualifications, licenses/certificates, and training to perform his/her job function. Records may include training identified in EHS plans (e.g., OSHA, DOT, Waste Management training), vehicle operator licenses, results of site-administered proficiency testing, and any other special licenses/certificates required by state/local law or the client.

A file shall be established and maintained for each piece of construction equipment, and all records relating to that equipment shall be placed in the file, including the Receipt Inspection Report, annual inspections (for cranes), record of the date the equipment was first placed in service, Daily Equipment Inspection records, maintenance records, repair records, record of the last date that the equipment was in service, demobilization inspection report, and the decontamination certificate, if applicable. For ease of retrieval, all records pertaining to pieces of equipment should be maintained in separate folders for each piece of equipment.

Additional copies of inspection reports and records may be required to be maintained in other project files, such as the procurement files and/or the Environmental Health and Safety files, based on the project's Documentation Plan.

The Equipment Supervisor should ensure that complete and accurate record of equipment utilization, including a list of idle equipment, is provided to the Quality Control Site Manager on a daily basis for inclusion in the Quality Control Daily Report.

It may be useful to maintain equipment utilization information on a spreadsheet depending on the size of the project. Information such as equipment mobilization date, date of first use, utilization of equipment by rental period (for example, if rental rate is based on hourly usage and is billed on a monthly cycle, there should be an entry for the number of hours the equipment was used in each billing period), scheduled equipment release date, actual release date, and demobilization date. This information may be useful in verification of vendor invoices, in review of production rates, for preparation of requests for change orders or equitable adjustment, or for backup for use in support of (or defense against) claims.

Copies of all maintenance and repair records for TtEC-owned construction equipment shall be forwarded to the TtEC Equipment Manager at the regional equipment yard on a periodic basis. This period should be monthly, and in no circumstances should it exceed quarterly. An Equipment Service Form is available from the Equipment Manager. This form shall be used to report unscheduled and preventative maintenance on TtEC-owned construction equipment.

The Equipment Manager produces a spreadsheet for TtEC-owned construction equipment that is distributed to the projects on a monthly basis. The Equipment Supervisor shall ensure that reports of mileage or meter readings and routine maintenance for all TtEC-owned construction equipment and vehicles assigned to the project are provided to the Equipment Manager for inclusion on the spreadsheet on a monthly basis. A Meter/Mileage Reading Update Form, available from the Equipment Manager, shall be used to report the required information.

The Equipment Supervisor should review the availability date included on the spreadsheet for TtEC-owned equipment and vehicles assigned to the project and inform the Equipment Manager of any required revisions to these dates.

The Equipment Supervisor shall complete an Equipment Transfer Report, available from the Equipment Manager, for all TtEC-owned construction equipment and vehicles to be mobilized to, and demobilized from the project. Copies of the Equipment Transfer Reports shall be provided to the Equipment Manager at the regional equipment yard.

There shall be no equipment disposal action (junk or sale) for TtEC-owned construction equipment or vehicles without prior notification and approval from the TtEC President.

## **4.1 Additional Considerations**

### **4.1.1 Control of Government Property**

Activities involving the use of Government property are to be controlled in accordance with Project Initiation/Operations Procedure PO-12, Government Property Control or by specific procedures negotiated with the Client in accordance with the contract's terms and conditions; such procedures shall be consulted where appropriate. Such activities may involve the handling or installation of Government property, whether furnished by the Government to TtEC or acquired by TtEC for use in the performance of work and for which the Government has retained title.

Government property may include construction tools and equipment purchased as a project cost, as well as permanent materials or equipment purchased for incorporation into the work. Project-specific procedures for control of Government property are to address issues relevant to the use, storage, inventory control, maintenance, and/or final disposition of the Government property.

### **4.1.2 Spill Control and Emergency Response Dedicated Tools and Equipment**

The project's Emergency Response Plan, or Emergency Action Plan (refer to the Environmental, Health & Safety - Programs Procedure EHS 2-1, Emergency Preparedness, for discussion of when each is required) is to identify dedicated personal protective equipment and emergency response tools and equipment to be available for an emergency response to a spill or discharge of hazardous material.

Dedicated emergency response tools and equipment are to be segregated and identified for use in emergency response situations. In accordance with the requirements of EHS Procedure 2-1, Emergency Preparedness the use of dedicated emergency response tools or equipment for any other activity is not to be permitted.

### **4.1.3 Inventory Control**

An individual should be designated as the Material Control Supervisor and should be responsible for inventory control of all tools issued from the tool control area. A log should be maintained for all tools issued and should record, as a minimum, the identification by name and employee number of the individual signing out the tool, the date and time the tool was signed out, the intended use of the tool (by area or system), an indication of when the tool is to be returned, and the time and date when the tool is returned.

Inventory control of tools assigned to individuals or crews should be performed on a daily basis as the tools are returned to the gang box or storage area. The crew foreman should be responsible for inventory control of tools assigned to the foreman's crew.

The Site Superintendent should immediately be made aware of any missing tools and should take the appropriate action to investigate and/or replace the missing tools.

#### **4.1.4 Disposition of Tools at Project Completion**

The Project Manager should make a determination of the disposition of tools remaining at the end of the project. The project may not be reimbursed by the client for the purchase of tools on certain cost reimbursable and lump sum projects. On other projects, a dollar value for individual tools may establish whether or not the client provides any reimbursement. The terms and conditions of the contract should provide direction as to the required disposition of the tools.

Tools for which the project has been reimbursed by the client are to be dispositioned in accordance with the client's preferences and the contract terms and conditions.

Tools purchased for the project as a project cost, and which are not to be turned over to the client, should be dispositioned by the Project Manager. Means of disposition may include, but not be limited to, declaring the tools surplus, sale of the tools, or providing the tools to another project. The Project Manager should consult with the appropriate Business Line Executive Vice Presidents, concerning disposition of project tools.

TtEC owned tools (i.e., not purchased as a project cost) should be dispositioned by the Project Manager based on consultation with the appropriate Business Line Executive Vice Presidents. Means of disposition of TtEC-owned tools may include, but not be limited to, declaring the tools surplus, sale of the tools, return of the tools to an equipment yard, or providing the tools to another project.

#### **4.1.5 Company-Owned Equipment**

TtEC utilizes regional equipment yard(s) for the temporary storage and maintenance of TtEC-owned construction equipment and vehicles when not currently assigned to a project. Available TtEC-owned equipment should be considered for support of a project's construction effort based on an analysis of the benefits to the project and/or TtEC. When evaluating TtEC owned equipment the requirements discussed in 4.1.6 below should be considered when making the equipment selection.

#### **4.1.6 Rental/Lease Equipment**

Agreements for rental/lease of construction equipment should be coordinated through an authorized procurement representative to ensure that appropriate terms and conditions are included in the agreement. The Scope of Work for the agreement should be developed and reviewed carefully, including review by the Site Superintendent or Equipment Supervisor for inclusion of sufficient detail in order to clearly define the scope of work.

The Equipment Supervisor, or requisitioner if there is no designated Equipment Supervisor, should review the terms and conditions of all rental/lease agreements to determine that the following topics are adequately addressed:

- Receipt and return of the rental or leased equipment and any required accessories;

- Inspection and documentation of receipt and release;
- Provision of documentation required to be submitted, such as Occupational Safety and Health Administration (OSHA) accredited inspection reports, NDE reports, test reports (i.e. load test for cranes), typically annual inspections, and wire rope certification.
- Provision of all safety equipment and accessories, as required, such as fire extinguishers, seat belts, Roll Over Protection Structures (ROPS), Falling Object Protection Structures (FOPS), access steps, handholds, platforms, and anti two-block devices and load moment indicator (cranes);
- Provision of documentation demonstrating operator certification;
- Provision of Certificate of Compliance when required, for instance by NAVFAC P-307 Management of Weight Handling Equipment, Appendix P - Contractor Crane Requirements.
- Provision and requirements of routine and non-routine maintenance and repairs, including payment for labor, parts, filters, lubricants, and fluids;
- Documentation requirements for the above maintenance and repairs;
- Disposal/recycling requirements for used parts, filters, lubricants, and fluids;
- Items such as point of delivery, costs of delivery and return, rental charges during idle time, notification requirements for demobilization, and point of return;
- Appropriate rental rate provisions for straight time and overtime;
- Responsibility for damage to equipment;
- Insurance;
- Indemnification (if included);
- Payment for replacement of parts subject to normal wear and tear, such as tires, tracks, cutting edges, and teeth; and
- Documentation requirements required in support of invoices for basic rental rates and overtime rates, as well as labor, parts, filters, lubricants, and fluids.

Rental agreements should be structured to include normal wear and tear on the equipment in the basic rental rate. In all cases, there should be mutual agreement with the equipment vendor as to the condition of the equipment as it is delivered. This should include items such as the life expectancy of the parts subject to wear and tear, their condition on receipt (i.e., percentage of usable life remaining), and the expected condition on return of the equipment. There should be agreement on minor versus major repairs and on what constitutes normal wear and tear. Mutual agreement is essential to mitigate potential claims from vendors for excessive wear and tear.

#### **4.1.7 Mobilization of Equipment**

Mobilization of construction equipment may be a long lead time item and may require client or third party involvement or approvals to gain site access, depending on the required equipment. The Site Superintendent or Equipment Supervisor should determine the lead time required, including Contract submittal and advance notice/approval requirements, and plan for the mobilization of equipment to support the project's schedule.

Planning for mobilization of equipment should include a thorough review of Contract requirements for utilization of each equipment and site access requirements.

Documentation of certification, and OSHA compliant annual inspection, load testing, safety devices (e.g., anti two-block) installed, wire rope certification, and operator's certification for cranes (weight handling equipment) should be reviewed prior to initiating mobilization of cranes.

#### **4.1.8 Equipment Maintenance**

The Equipment Supervisor should be responsible for administration of a construction equipment maintenance

program for the project. A spreadsheet of all TtEC-owned equipment, titled the Status of All Project Equipment, is maintained by the Construction Department providing notification of the scheduled maintenance requirements for each piece of equipment. Either this spreadsheet, or a project specific spreadsheet, should be maintained and statused on a periodic basis. Specific maintenance requirements may also be contained in specific contract negotiated property procedures or in other TtEC corporate procedures.

As construction equipment is received on site, it should be added to the spreadsheet for tracking of the required maintenance.

A review of the scheduled maintenance should be performed for all construction equipment to be used in the Exclusion Zone to determine the desirability of performing any upcoming scheduled maintenance prior to placing the equipment in service. It may be difficult and expensive to perform the maintenance under the conditions required in the Exclusion Zone, or to decontaminate the construction equipment in order to perform the maintenance under clean conditions. When the maintenance of equipment in the Exclusion Zone is anticipated, the Site Superintendent should ensure that qualified personnel are available with the appropriate medical clearances and certifications to work in the Exclusion Zone.

#### **4.1.9 Construction Equipment Safe Operation Requirements**

Standards for safe operation of equipment are contained in the documents identified herein, inclusive and in particular of the requirements for safe operation of lifting and rigging equipment and weight handling equipment. The Contract typically will specify certain documents/codes to be followed for the project. Accessibility of the identified documents is provided in section 5.0 References.

The United States Army Corps of Engineers (USACE) Safety and Health Requirements Manual, EM 385-1-1, Chapters 16, 17, and 18, provide guidance concerning the safe operation of construction equipment.

Safe operation of earth drilling equipment is addressed in the Environmental Health & Safety-Program Procedure EHS 6-2, Drill Rigs.

Safe operation of hand and power tools is addressed in OSHA standard 29CFR Part 1926 Subpart I.

Safe operation of cranes, derricks, hoists, elevators and conveyors is addressed in OSHA standard 29CFR Part 1926 Subpart N.

Safe operation of motor vehicles, mechanized equipment and marine operations is addressed in 29CFR Part 1926 Subpart O.

Rollover protective structures and overhead protection is addressed in 29CFR Part 1926 Subpart W.

The American Society of Mechanical Engineers (ASME) provides guidance in the B30 committee volumes – Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings.

The United States Department of Energy (DOE) provides guidance for safe lifting operations in Technical Standard DOE-STD-1090 – Hoisting and Rigging.

The United States Navy publication NAVFAC P-307 – Management of Weight Handling Equipment includes requirements for Contractor Cranes (see appendix P). Navy facilities issue Instructions specific to particular facilities such as 'NAVSHIPYDPUGET INSTRUCTION 11262.4A' which provides requirements for weight handling equipment at all Navy facilities within the Puget Sound.

#### **4.1.10 Demobilization of Equipment**

Construction equipment should be demobilized when no longer required for the work. The Executive Vice President of Construction should be provided with a status of TtEC-owned construction equipment and scheduled release dates in order to coordinate availability of equipment with other projects.

The Project Manager or designee should request demobilization instructions from the Executive Vice President of Construction or designee to determine the location to receive TtEC-owned equipment.

Construction equipment leaving the Exclusion Zone of a remediation construction project will be decontaminated in accordance with the requirements of the Environmental Health & Safety-Programs, Procedure EHS 3-4, Site and Contamination Control, and the site specific EHS Plan.

Individual state regulations may require cleaning of construction equipment leaving a site, not limited to remediation construction, in order to control the spread of microorganisms contained in the soil. Such requirements are to be identified in the project EHS plans.

### Please Describe Your Reference Here

Place Your Link in this Col

1. Accounting/Finance Procedure AF-8, Fixed Assets
2. ASME B30 committee publications "Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings" available at [www.ihserc.com](http://www.ihserc.com) Note that this is a commercial subscription and requires a User ID and Password available from the TtEC Librarian
3. DOE Technical Standard DOE-STP-1090 Hoisting and Rigging available at [www.directives.doe.gov](http://www.directives.doe.gov) (select the Tech Standards tab, select DOE Technical Standards, select Approved Standards and select DOE\_STD\_1090 from the menu)
4. Environmental, Health & Safety - Programs Procedure EHS 2-1, Emergency Preparedness
5. Environmental, Health & Safety -Programs Procedure EHS 3-4, Site and Contaminant Control
6. Environmental, Health & Safety -Programs Procedure EHS 6-2, Drill Rigs
7. Environmental Management System (EMS)
8. Labor Relations Guidelines LR-8, Pre-Job Conferences
9. NAVFAC P-307 Management of Weight Handling Equipment, Available via <http://www.safetycenter.navy.mil/instructions/osh/navfacP307.pdf#search=%22NAVFAC%20P-307%22>
10. The OSHA publications below are available at [www.osha.gov/](http://www.osha.gov/) select Regulations, select OSHA Regulations (Standards - 29 CFR), select Part 1926 Safety and Health Regulations for Construction
11. OSHA 29 CFR Part 1926 Subpart I Tools - Hand and Power
12. OSHA 29 CFR Part 1926 Subpart N Cranes, Derricks, Hoists, Elevators and Conveyors
13. OSHA 29 CFR Part 1926 Subpart O Motor Vehicles, Mechanized Equipment and Marine Operations
14. OSHA 20 CFR Part 1926 Subpart W Rollover Protection Structures Overhead Protection
15. OSHA 29 CFR Part 1910.178 Powered Industrial Trucks
16. OSHA 29 CFR Part 1910.180 Crawler Locomotive and Truck Cranes
17. Project Initiation/Operations Procedure PO-1, Project Management Planning
18. Project Initiation/Operations Procedure PO-2, Task Initiation
19. Project Initiation/Operations Procedure PO-12, Government Property Control

**Please Provide a Description of the Attachment**

- 1. Sample Equivalent/Vehicle Inspection Report
  
- 2. Sample Daily Equipment Inspection Form
  
- 3. Mobile and Crawler Crane Monthly Checklist
  
- 4. Operator/Driver Task Observation Checklist
  
- 5. Insurance Request for Leased Equipment

**Place Your Attachments Here**



CP-7 Att-1 -mod 20090924.doc



CP-7 Att-2 Daily Equip Insp\_mo



CP-7 Att-3 FJ.doc



CP-7 Att-4 Operator Observatio



CP-7 Att-5 FJ.doc

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**Purpose:** The purpose of this procedure is to establish a process for periodic inspections of project sites, offices and warehouses.

<b>Status:</b>	Complete	<b>Approved By:</b>	John DeFeis
		<b>Title:</b>	EHS Inspections
<b>Version Date - Type:</b>	11/09/2010 - Revised	<b>Original Issue</b>	02/01/95
		<b>Date:</b>	
<b>Category:</b>	Company Procedures	<b>Sections:</b>	ESQ - Environmental Health & Safety Programs
<b>Sub-Category:</b>	Departmental/Discipline	<b>Document</b>	Procedure
		<b>Type:</b>	
<b>Keyword Index:</b>	EHS Compliance/Waste Management, Field Activities/Environmental H&S, Training, Monitoring, Nonconformance and Corrective and Preventive Action	<b>Document</b>	Skip Parry
		<b>Owner</b>	

See Below

The purpose of this procedure is to establish a process for periodic inspections of project sites, offices and warehouses.

This procedure applies to all Tetra Tech EC, Inc. (TtEC) ("the Company") project sites, offices, and warehouses, including subcontractor activities.

The Project Manager (PM) is responsible for:

- a. Planning and budgeting for inspections as part of the project planning process in accordance with Task Initiation Procedure, PO-2 and the Project's Risk Management Plan.
- b. Ensuring that inspections are conducted in accordance with this procedure.
- c. Reviewing Environmental Health and Safety (EHS) inspection reports with on-site management.

The Site Manager (SM) or PM is responsible for:

- a. Participating in weekly EHS inspections as practicable.

- b. Ensuring that action items are developed, documented, and implemented and tracked to closure.

Site Supervisors are responsible for:

Conducting weekly EHS inspections for their area(s) of responsibility.

Ensuring that weekly inspection action items are implemented and documented in the project files.

The Operations Manager for each office and warehouse is responsible for ensuring that:

- a. Inspections of the office and, if applicable, warehouse are conducted on a quarterly basis.
- b. Action items are implemented and documented in a timely manner.

The Director, EHS Services, is responsible for:

- a. Reviewing and updating the inspection checklists as necessary.
- b. Monitoring conformance with the Project Environmental and Safety Manager (PESM) inspection requirements.
- c. Developing Lessons Learned Reports, Event Reports, or ZIP Bulletins for selected inspection findings

The PESH is responsible for:

- a. Approving and documenting PESH inspection frequency.
- b. Performing the PESH inspections and/or designating the appropriate technical specialist, as necessary, per the project schedule and budget.
- c. Immediately communicating significant violations or potential violations to the Project Manager and the Director, EHS Services.
- d. Preparing PESH inspection reports, issuing the report, and posting to the Company PESH inspection Database located on Lotus Notes within 10 days of the inspection.
- e. Tracking closure of each PESH inspection.
- f. Providing training in proper inspection techniques and as required to address action items.
- g. Reviewing EHS inspection reports.

The ESS is responsible for:

- a. Performing informal daily inspections of the worksite and documenting observations in the safety logbook.
- b. Assisting the PM or SM with weekly inspections.
- c. Reviewing the weekly and monthly inspection checklists for completeness, thoroughness, and trends. [Trends of action items in weekly and monthly EHS inspection results should be reviewed for similar](#)

[situations in other areas.](#)

The Office Environmental and Safety Coordinator (ESC) is responsible for:

- a. Assisting with quarterly inspections of the office and, if applicable, the warehouse.
- b. Training alternate office personnel on how to conduct office inspections.

For projects encompassing 1-week duration or more of consecutive workdays, the Site Supervisor shall conduct a weekly inspection of his/her area(s) of responsibility at the project site. The inspection shall:

- a. Include site conditions, employee and Subcontractor behaviors and work practices, pollution prevention and waste management practices, wastewater and other environmental conditions, or any other applicable requirements specified in the project EHS Plan(s).
- b. Be documented in an inspection report identifying the date, time, site conditions/operations, activities observed, personnel conducting the inspection, findings, recommended action items, individual responsible for implementation of each action item, and schedule for implementation. Attachment B may be used to document the inspection.

PESM inspections are budgeted inspections of remediation, clean construction, and consulting and engineering (C&E) projects. The PESH will either perform the inspection and/or designate an appropriate technical specialist. The PESH shall utilize a hierarchical risk based approach to determine inspection frequency at remediation, C&E, and clean construction projects.

- a. Specific checklist to be used for a given inspection will be determined by the PESH, based on the scope and risks of the project. The pertinent portions of each applicable checklist should be covered during at least one inspection annually.
- b. For programs with multiple task orders, the PESH will identify the task orders which should be inspected. Inspection frequency will be risk based to include an assessment of project scope, complexity, staffing, potential environmental, health, and safety standards.
- c. Inspections should occur soon after site mobilization and initiation of site activities. Subsequent PESH inspections shall be based upon the results of previous inspections; greater risk = increased inspection frequency. The PESH shall coordinate the date and time of the inspection with the PM and the SM.

For C&E field projects the PESH shall evaluate the need for field inspections. The determination of whether an inspection(s) is required should consider the factors described in paragraph b. above

Inspection frequency should be identified in the project EHS Plan.

The PESH shall **immediately** call the Director, EHS Services to report significant inspection findings including those that might require agency reporting. The Director, EHS Services, in conjunction with the legal department, will help the Project Manager and PESH determine if the finding requires agency reporting. If a determination is made that a finding must be reported, the client and agency will be notified in accordance with EHS 1-7, Event Reporting and Investigation.

The PESH shall post inspection reports, including checklists (Attachment C) and action items (Attachment E or equivalent), to the PESH Inspection Database within 10 days of the inspection.

All Action Items should be classified by the PESH as either Major or Minor, or recommendation. Major findings shall receive first priority schedule for addressing action items.

Action items should be addressed as described in the Action Item Report by the Project Manager and forward the completed Action Item Report to the PESH.

The PESH shall review the completed Action Item Report to ensure completeness and appropriate closure of all Action Items. The PESH shall post completed Action Item Reports to the PESH Inspection Database and close the inspection.

The Operations Manager shall ensure that EHS inspections are conducted at least quarterly at each office and warehouse, except for fire extinguishers and first aid kits which shall be inspected monthly. Attachment F, or an equivalent, shall be used to conduct and document the inspection. The Operations Manager shall send a copy of the completed Inspection Checklist to the Director EHS Services.

The Operations Manager shall ensure implementation and documented closure of all action items using the Action Item Report (Attachment E) or equivalent. The Operations Manager shall send the completed Action Item Report to the Director, EHS Services, within 30 days of conducting the inspection.

Inspection results should be analyzed for root causes. At least annually, the Director, EHS Services OR Director, Quality Programs, or his/her designee, shall review PESH inspection findings to identify trends.

This review should be documented and forwarded to the ESQ Program Directors, and to the Chief Executive Officer.

The ESQ Program Directors and the Chief Executive Officer will utilize the analysis to develop program and environmental objectives and targets, as appropriate.

The Director, EHS Services, shall ensure that individuals responsible for conducting inspections understand the Company's program requirements; applicable federal, state and local laws and regulations; and proper inspection techniques.

Records of all inspections and closure of identified Action Items related to EHS inspections shall be documented and maintained by the office or project as follows:

- a. Informal Inspections - Project Files
- b. Weekly Inspections - Project Files
- c. PESM Inspection Report - PESM Inspection Database
- d. Completed PESM Inspections Action Item Report - PESM Inspection Database
- e. Completed Office/Warehouse Inspections and Action Item Reports - Operations Manager

## 4.1 Definitions

A finding that indicates the real-time presence of a potential or imminent hazard, significant regulatory violation, or may result in imminent harm to people, property or the environment. Major findings are typically observed in the field at the time of inspection, and require immediate corrective action to reduce the risk of loss. Major findings must receive top priority for correction.

An observed finding which by itself is not a direct hazard, or potential harm to human health or the environment. Minor findings are usually associated with documentation, programmatic deficiencies, recordkeeping, reporting, or management/organizational practices.

### **Example #1: Findings associated with Stormwater Control Systems**

- a. **Major** - A significant breach in erosion control feature (e.g., missing or deteriorated hay bales).
- b. **Minor** - Failure to maintain documentation of required periodic inspections of erosion control features.

### **Example #2: Compliance with OSHA Ladder Standards**

- a. **Major** - Defective extension ladder observed.
- b. **Minor** - Failure to ensure all ladders are routinely inspected.

The ESS and all Company employees and Company subcontractor employees should be continuously aware of workplace and environmental conditions and the work practices of their fellow workers. If a substandard condition of work practice is identified, it shall be brought to the attention of the individual or supervisor, and corrected. Hazard Report and Suggestion Form (Attachment A) can be used to report substandard conditions or work practices. ZIP Slip (Attachment G) can be used to report exceptional practices or substandard conditions. ZIP Slips may be completed electronically using the Company Zip Slip Database. The Compliance Hot Line can also be utilized for anonymous reporting (See PP-18, Employee Reporting, Hotline and Non Retaliation).

The inspector should review project documents (Contract, TIP, Work Plans, EHS Plan(s), any pertinent decision documents, subcontractor approvals, permits, etc.) before the inspection.

The PESM should utilize the appropriate PESM Inspection Checklists (Attachment C) to perform the site inspection. Only the portions of the checklist applicable to the project being inspected will be utilized. The PESM should modify the inspection checklist as necessary for major projects.

Detailed environmental compliance checklists are very useful for the first PESM inspection of a site to ensure nothing is overlooked. (This is especially helpful if you are not the Project Regulatory Compliance Specialist and are not familiar with site activities). For subsequent PESM inspections, the Project's Regulatory Compliance and Waste Management Plans (or relative sections of the EHS Plan or Work Plans) may be used as the basis for the inspection to ensure site is implementing the Plan/s.

The PESM Inspection shall include:

- a. High risk activities (HIPO) and a visual inspection of the site. Areas of the project site that may be accessed and inspected include but are not limited to, exclusion zones, buildings, and waste storage areas.
- b. Completion of applicable and selected portions of the PESM Inspection Checklists or equivalent documentation (Attachment C).
- c. A review of on-site records (e.g., permits, agency approvals, waste analyses, waste profiles, waste manifests, discharge monitoring reports, training records, etc.).
- d. Positive recognition of conformance.
- e. Non-conformance noted by the PESM that can be remedied during the conduct of the inspection will be corrected. Conformance and non-conformance shall be documented on the PESM Inspection Checklists.
- f. Training of project and subcontract personnel, when possible, to address non-conformances.
- g. Identification of any observed positive practices.

The PESM will stop work if any conditions or work practices are identified which pose imminent danger to the environment or to the safety and health of personnel.

**Please Describe Your Reference Here**

**Place Your Link in this Column**

1. Environmental Health & Safety Programs, Procedure EHS 1-7, Event Reporting and Investigation
2. Personnel Practices Procedure PP-18, Employee Reporting, Hotline, and Non-Retaliation
3. Project Initiation and Operations Procedure PO-2, Task Initiation (TIP)
- 4.
- 5.
- 6.

**Please Provide a Description of the Attachment**

- A. Hazard Report and Suggestion Form
  
- B. EHS Weekly Checklists and Action Item Report
  
- C. PESH Inspection Checklist(s)

**Place Your Attachments Here**



ehs 1-7 Attachment B040301.doc



EHS 3-3 Attachment B, 3-24-2011.doc



EHS3-3 Attachment C Air, 8-10-09.doc



EHS 3-3 Attachment C Asbestos 5-24-11.doc



EHS 3-3 Attachment C Conservation, 6-21-06.doc



EHS 3-3 Attachment C Drinking, 6-21-06.doc



EHS 3-3, Attachment C EHS Programs, 6-5-06.doc



EHS 3-3 Attachment C Field Construction 5-24-11.doc



EHS 3-3 Attachment C HazWaste, 5-25-11.doc



EHS 3-3 Attachment C Lead, 6-30-09.doc



EHS 3-3 Attachment C Oil and Haz Subst, 7-6-09.doc



EHS 3-3 Attachment C PCB, 6-27-06.doc



EHS 3-3 Attachment C Solid, 6-27-06.doc



EHS3-3 Attachment C UST AST 5-24-11.doc



EHS 3-3 Attachment C Wetlands, 8-1-09.doc



EHS 3-3 Attachment C Wastewater, 6-30-09.doc



EHS 3-3 Attachment C Hazwaste Perm, 5-25-11.doc



EHS 3-3 Attachment C, Radioactive Mat DOE, 7-25-2005.doc



EHS 3-3 Attachment C, Radioactive Mat NRC, 7-25-2005.doc



EHS 3-3 Attachment C, Radioactive Mat, 7-2005.doc

E. Action Item Report



EHS 3-3 Attachment E.doc

F. EHS Office/Warehouse Inspection Checklist



EHS 3-3 Attachment Fgc122809.doc

G. ZIP Slip

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**Purpose:** This program provides the requirements for activities involving excavations in accordance with 29 CFR 1926, Subpart P - Excavations.

<b>Status:</b>	Complete	<b>Approved By:</b>	John DeFeis
<b>Version Date - Type:</b>	07/03/2001 - Revised	<b>Title:</b>	Excavation and Trenching
<b>Category:</b>	Company Procedures	<b>Original Issue</b>	02/01/95
<b>Sub-Category:</b>	Departmental/Discipline	<b>Date:</b>	
<b>Keyword Index:</b>	EHS Compliance/Waste Management, Field Activities/Science, Operational Control, Training, Monitoring	<b>Sections:</b>	ESQ - Environmental Health & Safety Programs
		<b>Document</b>	Procedure
		<b>Type:</b>	
		<b>Document</b>	Skip Parry
		<b>Owner</b>	

Section

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3.0 MAINTENANCE

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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**

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EHS 6-3 Attachment B.doc

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Proprietary Information

**Purpose:** The purpose of this guideline is to provide the designated Project Manager, Project Supervisors and the Environmental Safety Supervisor with procedural guidance for planning and implementing measures to control exposures to poisonous plants, provide protection to workers, establish contamination control and medical case management.

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<b>Category:</b>	Reference Documents	<b>Original Issue</b>	
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		<b>Type:</b>	
		<b>Document</b>	Grey Coppi
		<b>Owner</b>	

- 1.0 Purpose
- 2.0 Scope
- 3.0 Maintenance
- 4.0 Definitions
- 5.0 Responsibilities
  - 5.1 Project Manager
  - 5.2 Project Environmental Safety Manager
  - 5.3 Environmental Safety Supervisor
- 6.0 Guideline to Contamination Control
  - 6.1 Discussion
  - 6.2 Properties of Urushiol
  - 6.3 Control Measures to Prevent Exposure to Urushiol
  - 6.4 Preventing Contact
  - 6.5 Recognition of Poisonous Plants
  - 6.6 Personal Protection
    - 6.6.1 Skin Barriers
    - 6.6.2 Personal Protective Equipment
  - 6.7 Decontamination
  - 6.8 Medical Surveillance and Treatment
- 7.0 References

The purpose of this guideline is to provide the designated Project Manager, project supervisors and the Environmental Safety Supervisor with procedural guidance for planning and implementing measures to control exposures to poisonous plants, provide protection to workers, establish contamination control and medical case management

This procedure applies to any field project site where poisonous plants are anticipated or known to be present.

The Director, Environmental Safety and Quality 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 Director Compliance and Corporate Counsel.

Poisonous plants – plants in the family Anacardiaceae, especially *Toxicodendron spp.* (poison oak, poison ivy and poison sumac)

Urushiol – an oil found in poisonous plants that causes a human allergic skin rash on contact.

### **5.1 Project Manager (PM)**

The PM shall ensure that adequate project resources are provided to the ESS to carry out the requirements of this guideline on site. The PM shall ensure that a health and safety budget has been developed and reviewed by the project environmental safety manager. The PM shall require that all field personnel, including subcontractors participating in the work, have had training as required by this guideline.

### **5.2 Project Environmental Manager (PESM)**

The PESM will review Site Health and Safety Plans (SHSP), Injury Illness Prevention Plans (IIPP) and other work plans to ensure that the plans refer to this guidance whenever poisonous plants are anticipated or encountered.

### **5.3 Environmental Safety Supervisor (ESS)**

The ESS is responsible for implementation of the project SHSP or IIPP on site. The ESS will review this guideline, provide training to workers, implement control and protection methods, and ensure medical surveillance and case management is established for affected workers.

## **6.1 Discussion**

The poisonous plants covered by this guidance have an oily substance on their leaves and within the plant that is called urushiol. Skin contact with urushiol can cause a severe rash. Urushiol is not a singular chemical but rather contains a number of different chemicals. The majority of the chemicals that cause the rash are in a chemical class called catechols. These catechols penetrate the skin and stimulate an allergic reaction within 15 minutes after contact with the skin. Since the toxic substance causes a rash, urushiol should be managed and handled as if it were a hazardous chemical. Therefore, this is a guideline on how to prevent exposure, protect the worker, control the spread of contamination, decontaminate clothing, tools, equipment and personnel exposed to the contaminant and to provide treatment to workers exposed to the contaminant.

## 6.2 Properties of Urushiol

Urushiol is a pale yellow oily liquid similar to petroleum oil. The oil has a boiling point of 200-210 ° C. It is soluble in alcohol, ether and benzene. It is not soluble in water but mixes with water like any oil. This fact is important when decontaminating skin or clothing.

## 6.3 Control Measures to Prevent Exposure to Urushiol

Control measures are summarized as follows:

### Prevent contact

If contact is necessary or likely, wear protective clothing to prevent actual skin contact

If contact is made to clothing, assume the outside of the clothing is contaminated and may result in a rash, and must either be discarded or properly cleaned prior to reusing.

If contact with the skin is made, prompt cleaning is necessary.

The remainder of this guide provides specific information of these elements.

## 6.4 Preventing Contact

Urushiol is found in the leaves, the sap, the vines and all woody parts of any of the poisonous plants including the roots. The only control measure to prevent exposure is to not contact any poisonous plant. All eradication methods can cause worker exposure. The two worst methods of plant eradication from an exposure perspective are burning and grubbing. When burned, the ash and smoke is extremely toxic and cause significant damage and irritation to the lungs and all exposed skin. Stems, leaves and other parts of the plant, if not completely burned, will still have the oil present and will cause irritation upon contact. Clearing and grubbing mixes the toxic plant debris with other plants and creates a larger volume of debris that may cause exposure. Remember, the oil is like any other oil, it will rub off on anything it contacts. If weed killers are used, the plant will die but the urushiol can remain active up to 5 years. Only complete removal of the plant will minimize future exposure to the urushiol. The only way to prevent exposure is to avoid direct contact or to wear protective clothing and follow up with a decontamination process.

## 6.5 Recognition of Poisonous Plants

References at the end of this guideline show pictures of the plants. Poison ivy is more common on the east coast. California has predominantly poison oak. Prior to performing work at any job site, the entire work area should be surveyed for any hazards. Among the potential hazards are poisonous plants. If the plants are discovered, the location of the plants should be marked. If possible the work area should be avoided. If work must take place in the area then personal protective equipment and decontamination methods are required.

## 6.6 Personal Protection

### 6.6.1 Skin Barriers

There are skin barrier lotions that can be applied to the skin **prior** to working in areas with poisonous plants. The barrier creams, like Ivy Block®, contain bentoquatam, a bentonite derivative. The barrier cream is effective only as long as the film is visible on the skin. With or without the use of barrier cream additional

protection is required. **Post** exposure decontamination is discussed in Section 6.7.

### **6.6.2 Personal Protective Equipment (PPE)**

Any skin, clothing or equipment that comes into contact with a poisonous plant will likely have the oil rubbed off. The first level of protection is to wear long sleeve shirts, long pants banded at the work boots, and gloves with the sleeves banded at the gloves. Workers must avoid any hand to face or any other bare skin contact with the gloves or any other clothing or equipment exposed to the oil. An additional layer of clothing such as coveralls and boot covers can reduce the inadvertent contact with the oil. The use of protective clothing will facilitate an effective decontamination procedure that is described below.

Workers should wear outer coveralls that can be removed at the end of the day and either be discarded, if they are disposable, or placed in a laundry hamper to be washed at a commercial laundry. Disposable boot covers should be worn; otherwise boots (PVC, rubber or similar materials) that can be washed with soap and water before leaving the site will be worn. Leather is not washable to remove the oils, so leather work boots must be covered by a protective boot cover.

The coverall can be made of any material including cotton (washable coveralls), a permeable disposable coverall, like Kleengaurd® or Durafab®, or less permeable or impermeable disposable coveralls like Tyvek®, Saranex®, PVC, etc. Almost any material can be used, provided the oil does not penetrate and come in contact with the skin. Gloves can be any material except cotton. Leather gloves will offer protection but would need to be discarded at the end of the day. Latex or nitrile gloves are the common gloves worn, but use care as they can puncture or be cut easily. Therefore wear an outer protective glove if working around or with anything that may damage the gloves.

### **6.7 Decontamination**

After working in an area with poisonous plants, a properly executed decontamination procedure should minimize exposure to the contaminant as described below:

1. Wash the outer surfaces of all potentially exposed equipment with soapy water. Use soap with good oil removing properties, such as Dawn® dishwashing liquid or Alconox®. Rinse the equipment with clean cool water.
2. Remove boot covers and discard. If the boot covers are non-disposable or only boots were worn, wash the boots with soapy water, rinse the boots, and dry with a paper towel.
3. Remove the coveralls by taking them off from the inside out. That is, as the coverall is removed the inner sleeves are pulled out and the rest of the coverall follows so what was once the outer surface is now inside the coverall. Discard the disposable coverall in ordinary trash bags or place coveralls requiring laundering in a laundry hamper.
4. Remove the gloves from the inside out and discard or place in location to be washed if they can be reused (gloves other than nitrile or latex).
5. Wash hands, wrists, and forearms with soap and water.

Anything that may have come in contact with the contaminant must either be washed or discarded, unless it had a protective cover that has been removed and is either left in the decontamination area or has been discarded. Note protective covers left in the decontamination area must be handled as contaminated. It is preferable to not reuse protective covers.

6. All decontamination water can be disposed as ordinary water waste. The surfactants are biodegradable and have no environmental restrictions for disposal.

Before leaving the site inspect any areas of skin that could have been exposed to the oil. Inspect the areas between the top of the boots to the lower legs and inspect the forearms, wrists and hands. As an extra precaution these areas can be washed with soap and water and be treated as if they had been exposed as

described below:

1. Areas of the skin exposed to the oil need to be washed with cool water as soon as possible. The reaction to the oil can begin 15 minutes upon contact. However, the first noticeable rash may not be visible from anywhere between one hour and even up to 10 days after the exposure. This why if any contact with the oil is even suspected, the worker should immediately wash the area.
2. Urushiol is not soluble in water so there is a high probability of spreading the oil over even more skin if water is used. However, almost any washing technique used has that same potential. Urushiol is soluble in mineral spirits. There are skin washes designed to remove the oil using this solvent. Technu® and Zanfel® are such products.
3. A preferred wash method is to cleanse the skin with the Technu or Zanfel scrub. Follow this by a soapy cool water wash and a cool clean water rinse. Then dry the skin with a towel. Wash only as much of the skin as necessary. When returning to home or quarters, take a cool shower. Do not take a bath as any residual oils you may be unaware of can get in the bath water and expose even more of your skin.

## **6.8 Medical Surveillance and Treatment**

Inspect yourself at least twice a day when working around poisonous plants. Since it make take as long as 10 days for any symptoms to appear, continue to do this inspection at least 10 days after the last day of project work around these plants. Once exposed the skin rash and blistering will be most noticeable in those areas that received the highest exposure to the oil. Later lighter appearance of rash may show but this is not from the rash “spreading” rather it is from lighter exposures to the oil. Breaking a blister will not spread the rash but may increase chances for a skin infection.

Once a rash is noticed immediately notify the ESS so that WorkCare can be contacted and medical counseling can be started. Do this as soon as possible so that the best care can be provided. Do not attempt to self medicate or take care of the rash without the guidance of WorkCare.

Treatment will often include cold wet compresses, short cool baths, calamine lotion, and anti-itch creams. Benadryl® (diphenhydramine) may be taken to control itching and encourage sleep. However in all cases, the best practice is to contact WorkCare first.

### **Please Describe Your Reference Here**

1. Med-Line Plus Medical Encyclopedia
2. Outsmarting Poison Ivy and its Cousins, Food Drug Administration
3. American Academy of Dermatology
4. Poison Ivy, Oak and Sumac Information Center

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**APPENDIX C**  
**FIELD FORMS**

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EHS WEEKLY/MONTHLY CHECKLIST AND ACTION ITEM REPORT

Inspection Type:  Weekly  Monthly

Project/Location:	Inspector/s:	Time/Date:
TOPIC	OBSERVATIONS	FINDING (Y/N)
<b>Weather Conditions at time of Inspection</b> _____.		
<b>Work Conditions</b>		
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 i think this can go away since I don't know what it refers to.		
10. Lighting		
11. Noise Exposure		
12. Ergonomics (EHS 3-1, Attachment B)		
13. Site Perimeter and Control Zones Identified		
<b>Equipment</b>		
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		
<b>Material Handling Equipment</b>		
17. Hoisting and Rigging		
18. Lifting Aids Used When Possible		
19. Proper Lifting Techniques Used		
<b>Electrical Safety</b>		
20. Power Cords		
21. GFCI		
22. Generators		
23. Breaker Box Access/Clearance		
<b>Hazardous Materials</b>		
24. Hazardous Chemical List Current		
25. MSDS		



**ATTACHMENT B  
TETRA TECH EC, INC.**

**EHS WEEKLY/MONTHLY CHECKLIST AND ACTION ITEM REPORT**

Inspection Type:     Weekly         Monthly

Project/Location:	Inspector/s:	Time/Date:
TOPIC	OBSERVATIONS	FINDING (Y/N)
26. Labeling		
27. Signs/Postings/Color Coding		
28. Proper Storage and Segregation of Hazardous Materials		
29. Compressed Gas Storage and Use		
<b>Emergency Systems</b>		
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		
<b>Protective Equipment</b>		
36. PPE used, stored, and maintained in accordance with EHS plan		
37. Respirator use, storage, and maintenance		
<b>Hazardous Waste Storage Area (HWSA)/Satellite Accumulation Area (SAA)</b>		
38. If HWSA are present, they are being inspected and documented weekly.		
39. Findings are being corrected.		
40. Wastes stored in designated, secured area with "Hazardous Waste" signage. For SAA, area is marked "SAA". SAA located at the point of generation.		
41. Containers of hazardous waste marked with the words "hazardous waste"		
42. Wastes accumulated onsite are within allowed time limits (e.g., < 90 days for large quantity generators) - check accumulation start dates on containers in HWSA and compare to tracking log.		
43. Waste in SAA limited to max of 55 gallons and when full, moved to HWSA within 3 days.		
44. Hazardous Waste Container Standards:		



EHS WEEKLY/MONTHLY CHECKLIST AND ACTION ITEM REPORT

Inspection Type:  Weekly  Monthly

Project/Location:	Inspector/s:	Time/Date:
TOPIC	OBSERVATIONS	FINDING (Y/N)
i. DOT-spec. containers (for wastes to go off-site only)		
ii. Intact/in good condition		
iii. Waste compatible with containers (e.g., no evidence of corrosion, softening, bulging)		
iv. Securely closed and stored to prevent rupture/leaking, except when add/remove waste.		
45. Reactive/ignitable wastes stored at least fifty (50) feet from property.		
46. Liquid wastes within secondary containment (BMP, check WMP to determine state requirements).		
47. Incompatible wastes separated by a dike, wall, berm or other device.		
48. In HWSA, containers are separated by minimum 36 inch aisle space. Labels and markings are visible and legible on all containers.		
<b>Hazardous Waste Tank Storage Area</b>		
49. Daily written inspection is being conducted and is maintained on site. The inspection requirements in the plan are being documented as required.		
<b>Waste/Stockpiles</b>		
50. Refer to: 1. Attachment C – Hazardous Waste Less Than 90 Days For Hazardous Waste Stockpiles; 2. Attachment C – Solid Waste For State Regulated/Non-Hazardous Stockpiles; and/or 3. Attachment C – PCB for PCB Stockpiles		
<b>TSCA PCB Wastes</b>		
51. Inspected every 30 days at a minimum. Refer to Attachment C - PCB Checklist for < 30 day or less than 1 year storage area requirements and general PCB container storage requirements		



EHS WEEKLY/MONTHLY CHECKLIST AND ACTION ITEM REPORT

Inspection Type:  Weekly  Monthly

Project/Location:	Inspector/s:	Time/Date:
TOPIC	OBSERVATIONS	FINDING (Y/N)
<b>Spill Prevention and Preparedness</b>		
52. Outside of containers or tanks (as applicable) show no signs of deterioration, leaks, or discharges at seams, gaskets, piping, pumps, valves, rivets, or bolts.		
53. Appropriate containment materials are available and accessible, which may include: drip pans, dikes, berms, retaining walls, curbing, other barriers, spill diversion ponds, retention ponds, or integrated secondary containment structures.		
54. Spill control and response materials are available, which may include: designated spill response kits, drip pans, sorbent materials, oil retention booms (floating or sorbent), sand bags/temporary curbing devices, fuel recovery pumps/collection hoses, fuel recovery tank trucks, and tools.		
55. Is there any evidence of a sheen or discoloration on the ground? Are hazardous materials stored properly in a manner that minimizes potential for spills?		
56. Emergency Contact Lists are current and posted.		
57. People have received training.		
58. Does the project have a Spill Response, Control, and Countermeasures (SPCC) Plan? If yes, are inspections being performed and documented as required in the plan? Has the plan been updated as required?		
<b>Stormwater Pollution Prevention and Erosion Controls</b>		
59. Are site activities causing land disturbance being performed (grading, excavating, clearing and grubbing, demolition and foundation removal, etc?)		



EHS WEEKLY/MONTHLY CHECKLIST AND ACTION ITEM REPORT

Inspection Type:  Weekly  Monthly

Project/Location:	Inspector/s:	Time/Date:
TOPIC	OBSERVATIONS	FINDING (Y/N)
58. Are there surface waters present on or adjacent to the site that could be impacted by runoff from the site? Is there any evidence of runoff from the project site to these areas?		
59. Are there storm drains, catch basins or other conveyances that collect stormwater? Are there activities occurring that could cause oil, contaminants, or sediments to enter these conveyances?  If yes, are there measures in place or needed to protect stormwater quality?		
60. Are there signs of erosion on recently disturbed soils (channelization, rivulets, siltation runoff, etc.)? Can the erosion lead to sediment or runoff to surface water or conveyances? If yes, are erosion control BMPs necessary or recommended?		
61. Are BMPs being implemented per the environmental project plans? For instance, preventative maintenance, good housekeeping practices, proper waste storage and storage of hazardous materials, etc.?		
62. Does the project have a total land disturbance = or > 1 acre or is the project part of a larger or common plan of development that could exceed an acre of disturbance?		
63. Does the project have a Stormwater Pollution Prevention Plan (SWPPP)? If yes, are inspections being performed and documented as required in the plan?		
64. Fugitive Dust – Appropriate BMPs are instituted for fugitive dust emissions.		
<b>Other Conditions or Work Practices</b>		
65.		
66.		
67.		
68.		



ATTACHMENT B  
TETRA TECH EC, INC.

EHS WEEKLY/MONTHLY CHECKLIST AND ACTION ITEM REPORT

Project/Location:	Inspector/s:	Time/Date:	
ACTION ITEM	RESPONSIBLE PARTY	SCHEDULE	DATE COMPLETED
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			

Reviewed by: \_\_\_\_\_  
Site Superintendent/ Site Manager

\_\_\_\_\_ Date

cc: Project Manager (monthly only)  
PESM (monthly only)



DAILY EQUIPMENT INSPECTION

PROJECT \_\_\_\_\_

MANUFACTURER TYPE \_\_\_\_\_

UNIT # \_\_\_\_\_ MODEL \_\_\_\_\_ DATE \_\_\_\_\_

ENGINE HRS/MILEAGE \_\_\_\_\_ / \_\_\_\_\_ SHIFT \_\_\_\_\_

Check appropriate column and describe correction needed.

	If Good (✓)	NA	Correction Needed
Steering Mechanisms <sup>1*</sup>	_____	_____	_____
Service Brakes <sup>2</sup>	_____	_____	_____
Emergency Brakes <sup>1</sup>	_____	_____	_____
Parking Brake <sup>1</sup>	_____	_____	_____
Transmission & Controls	_____	_____	_____
Suspension & Springs	_____	_____	_____
Hydraulic Leaks	_____	_____	_____
Exhaust System	_____	_____	_____
Warning Gauges	_____	_____	_____
Windshield <sup>1</sup> & Wipers	_____	_____	_____
Lights (Head & Tail)	_____	_____	_____
Brake Lights <sup>1</sup>	_____	_____	_____
Mirrors	_____	_____	_____
Seat and Seat Belts <sup>1</sup> (w/ ROPS)	_____	_____	_____
Tires/Tread <sup>1</sup>	_____	_____	_____
Regular Horn	_____	_____	_____
Audible Back-up Alarm <sup>1</sup>	_____	_____	_____
Steps, Hand-holds	_____	_____	_____
Fire Extinguisher	_____	_____	_____
Engine Coolant	_____	_____	_____
Engine Oil	_____	_____	_____
Hydraulics & Operating Controls	_____	_____	_____
Fenders/Mudflaps	_____	_____	_____
Heater/defroster	_____	_____	_____
<u>All items in cab or bed secured</u>	_____	_____	_____
<u>Cleanliness inside and outside</u>	_____	_____	_____

Remarks:

<sup>1</sup> Items required to be operational by OSHA 1926.602 before use.

<sup>2</sup> Service brake must be capable of stopping and holding equipment fully loaded. \_\_\_\_\_

Operator Name (Printed) \_\_\_\_\_

Operator Signature \_\_\_\_\_

Review : Superintendent \_\_\_\_\_

Date Repairs or adjustments completed: \_\_\_\_\_

Equipment Supervisor/Mechanic: \_\_\_\_\_

**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**

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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.*

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**APPENDIX D**  
**CONTRACTOR SIGNIFICANT INCIDENT REPORT (CSIR)**

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- Initial Report
- Follow-up Report
- Final Report

## Contractor Significant Incident Report (CSIR)

1. General Information		
Contracting Activity/ROICC Office:		
<b>Accident Classification:</b>		
<input type="checkbox"/> Injury <input type="checkbox"/> Fatality <input type="checkbox"/> Environment <input type="checkbox"/> Procedural Issues <input type="checkbox"/> Lessons Learned <input type="checkbox"/> Illness <input type="checkbox"/> Property Damage <input type="checkbox"/> Other _____		
<b>Involving:</b>		
<input type="checkbox"/> Confined Space <input type="checkbox"/> Equip/Mrt Ver/Mat Handling (Heavy Construction Equip.) <input type="checkbox"/> Hazardous Material <input type="checkbox"/> Crane and Rigging <input type="checkbox"/> Equip/Mrt Ver/Mat Handling (Material Handling) <input type="checkbox"/> Trenching/Excavation <input type="checkbox"/> Diving <input type="checkbox"/> Equip/Mrt Ver/Mat Handling (Man-Lift/Elevated Platform) <input type="checkbox"/> Waterfront/Marine Operations <input type="checkbox"/> Demolition/Renovation <input type="checkbox"/> Fall from Ladder <input type="checkbox"/> Fall from Scaffold <input type="checkbox"/> Other _____ <input type="checkbox"/> Electrical <input type="checkbox"/> Fall from Roof <input type="checkbox"/> Fire		
2. Personal Information		
Name (Last, First, MI):	Age:	Sex:
Job Title/Description:	Employed By:	
Supervisor Name (Last, First, MI) & Title:	Was the person trained to perform this activity/task? <input type="checkbox"/> Yes <input type="checkbox"/> No	
What type of training was received (OJT, classroom, etc)?	Date of the most recent formal training and topics discussed?	
3. Witness Information		
Witness #1: Name (Last, First, MI):	Job Title/Description:	
Employed By:	Supervisor Name (Last, First, MI):	
Witness #2: Name (Last, First, MI):	Job Title/Description:	
Employed By:	Supervisor Name (Last, First, MI):	
<b>Additional Witnesses:</b> <i>(List any additional witnesses on a separate sheet and attach.)</i>		
<input type="checkbox"/> Yes <input type="checkbox"/> No		

4. Contract Information		
<b>Type of Contract:</b> <input type="checkbox"/> A/E <input type="checkbox"/> BOS <input type="checkbox"/> CLEAN <input type="checkbox"/> Construction <input type="checkbox"/> Design Build <input type="checkbox"/> FSCC <input type="checkbox"/> FSSC <input type="checkbox"/> JOC <input type="checkbox"/> RAC <input type="checkbox"/> Service <input type="checkbox"/> Other _____		
<b>Contract Number &amp; Title:</b>		<b>Industrial Group &amp; Industrial Type:</b>
<b>Prime Contractor Name/Address/Phone &amp; Fax No:</b>		<b>Sub Contractor Name/Address/Phone &amp; FAX No:</b>
<b>Safety Manager (Last, First, MI):</b>		<b>Safety Manager (Last, First, MI):</b>
<b>Insurance Carrier:</b>		<b>Insurance Carrier:</b>
5. Accident Description		
<b>Date of Accident:</b>	<b>Time of Accident:</b>	<b>Exact Location of Accident:</b>
Describe the accident in detail in your words: <i>(Use the back of page if you need additional space)</i>		
<b>Direct Cause(s) of Accident:</b>		

<b>Indirect Cause(s) of Accident:</b>	
<b>Action(s) taken to prevent re-occurrence or provide on-going corrective actions:</b>	
<b>Corrective Action Beginning Date:</b>	<b>Anticipated Completion Date:</b>
<b>Personal Protective Equipment:</b> <input type="checkbox"/> Available and used <input type="checkbox"/> Available and not used <input type="checkbox"/> Not Required <input type="checkbox"/> Not related to Mishap <input type="checkbox"/> Wrong PPE for job  <b>List PPE Used:</b>	
<b>Type of Construction Equipment (Make, Model, Serial #, VIN#) Involved:</b>	
<b>Was Hazardous Material Spilled/Released?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <b>Please List Hazardous Material(s) Involved:</b>	
<b>Who provided first aid or cleanup of mishap site?</b>	
<b>Any blood-borne pathogen exposure, other than EMTs?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No  <b>Who?</b>	
<b>List OSHA and EM-385-1-1 standards that were violated:</b>	
<b>Was site secured and witness statements taken immediately?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No  <b>By Whom?</b>	

6. Injury Illness/Fatality Information		
<b>Severity of Injury/Illness:</b>		
<input type="checkbox"/> Fatality	<input type="checkbox"/> Lost Workday Case Involving Days Away From Work	
<input type="checkbox"/> Temporary Disability	<input type="checkbox"/> Recordable Workday Case Involving Restricted Duty	
<input type="checkbox"/> Permanent Total Disability	<input type="checkbox"/> Other Recordable Case	<input type="checkbox"/> Recordable First Aid Case
<input type="checkbox"/> Permanent Partial Disability	<input type="checkbox"/> Non-Recordable Case	<input type="checkbox"/> No Injury
<b>Estimated Days Lost:</b>	<b>Estimated Days Hospitalized:</b>	<b>Estimated Days Restricted Duty:</b>
<b>List Primary Body Part Affected:</b>	<b>List Other Body Part(s) Affected:</b>	
<b>Nature of Injury/Illness for Primary Body Part (Examples: Amputation, Burn, Hernia):</b>		
<b>Type of Accident (Examples: Fall same level, Lifting, Bitten, Exerted):</b>		
<b>Source of Accident (Examples: Crane, Carbon Monoxide, Ladder, Welding Equipment):</b>		
7. Causal Factors <i>(Explain answers on supplementary sheet)</i>		
• Design – Design of facility, workplace, or equipment was a factor?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Inspection/Maintenance – Inspection & Maintenance procedures were a factor?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Persons Physical Condition – In your opinion, the physical condition of the person was a factor?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Operation Procedures – Operating procedures were a factor?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Job Practices – One or more job safety/health practices not being followed when the accident occurred contributed to the accident?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Human Factors – One or more human factors, such as a person's size or strength contributed to the accident?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Environmental Factors – Heat, cold, dust, sun, glare, etc., contributed to the accident?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Chemical and Physical Agent Factors – Exposure to chemical agents, such as dust, fumes, mist, vapors, or physical agents such as noise, radiation, etc., contributed to the accident?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Office Factors – Office setting such as lifting office furniture, carrying, stooping, contributed to the accident?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Support Factors – Inappropriate tools/resources were provided to perform the task?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• PPE – Improper selection, use or maintenance of PPE contributed to the accident?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Drugs/Alcohol – In your opinion, were drugs or alcohol a factor?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Job Hazard Analysis – The lack of an adequate (IAW-EM-385-1-1 Sec 01.A) activity hazard analysis was a contributing factor.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Job Hazard Analysis – JHA was not site specific and/or did not address the type of work/operations performed when the mishap occurred.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Management – A lack of adequate supervision contributed to the accident.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Management – Inadequate information was provided at pre con meeting.	<input type="checkbox"/> Yes	<input type="checkbox"/> No

<b>8. OSHA Information</b>			
<b>Date OSHA was Notified:</b>	<b>Date(s) of Investigation:</b>	<b>Date of citation: (Attach Copy)</b>	<b>Dollar amount of Penalties:</b>
<b>9. Report Preparer</b>			
<b>Name (Last, First, MI):</b>		<b>Date of Report:</b>	
<b>Title:</b>		<b>Signature:</b>	
<b>Employer:</b>			
<b>Phone #:</b>			

# CONTRACTOR SIGNIFICANT INCIDENT REPORT (CSIR) INSTRUCTIONS

## Complete Sections Appropriate to Incident (Rev. 06/02).

**NOTE: THE ATTACHED CSIR FORM IS TO BE USED BY CONTRACTORS TO RECORD THE RESULTS OF THEIR ACCIDENT/INCIDENTS INVESTIGATIONS AND SHALL BE PROVIDED TO THE CONTRACTING OFFICER WITHIN THE REQUIRED TIMEFRAMES.**

**GENERAL.** Complete a separate report for each person who was injured in the accident. A report needs to be completed for all OSHA recordable accidents, property damage in excess of \$2000.00 (This amount is for record purposes only. GOV is not required to enter property damage reports into FAIR database if it is less than \$10,000.00.), WHE accidents, or near miss/high visibility mishaps. Please type or print legibly. Appropriate items shall be marked with an "X" in box(es), non-applicable sections shall be marked "N/A". If additional space is needed, provide the information on a separate sheet of paper and attach to the completed form.

Mark the report:

**INITIAL** – If this form is being used as initial notification of a Fatality or High Visibility Mishap. The initial form is due within 4 hours of a serious accident. A form marked 'Follow-up' or 'Final' is required within 5 days.

**FOLLOW-UP** – If you are providing additional information on a report previously submitted.

**FINAL** – If you are providing a completed report and expect no changes.

## SECTION 1 – GENERAL INFORMATION

**CONTRACTING ACTIVITY/ROICC OFFICE** - Enter the name and address of the Contracting Office administering the contract under which the mishap took place (e.g. ROICC MCBH, ROICC NORFOLK, PWC GUAM, etc.).

**ACCIDENT CLASSIFICATION - INJURY/ILLNESS/FATALITY/PROPERTY DAMAGE/-PROCEDURAL ISSUES/-ENVIRONMENTAL/LESSONS LEARNED/OTHER** – Mark the appropriate block(s) if the incident resulted in any of these conditions.

**INVOLVING** - If the mishap involved any of the conditions listed under "Involving" mark the appropriate box(es). Specific questions associated with each of these conditions are available from the Contracting Officer to assist you in your investigation. When these questions are used they shall be attached as part of this report.

## SECTION 2 - PERSONAL INFORMATION

**NAME** - Enter last name, first name, middle initial of person involved.

**AGE** - Enter age.

**SEX** - Enter M for Male and F for Female.

**JOB TITLE/DESCRIPTION** - Enter the job title/description assigned to the injured person (e.g. carpenter, laborer, surveyor, etc.).

**EMPLOYED BY** - Enter employment company name of the person involved.

**SUPERVISOR'S NAME & TITLE** - Enter name and title of the immediate supervisor.

**WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK?** - For the purpose of this section "trained" means the person has been provided the necessary information (either formal and/or on-the-job (OJT) training) to competently perform the activity/task in a safe and healthful manner.

**TYPE OF TRAINING** - Indicate the specific type of training (classroom or on-the-job) that the injured person received before the accident happened.

**DATE OF MOST RECENT FORMAL TRAINING/TOPICS DISCUSSED** - Enter the month, day, and year of the last *formal* training completed that covered the activity/task being performed at the time of the accident. List topics that were discussed at the training identified above.

## SECTION 3 - WITNESS INFORMATION

The following applies to Witness #1 and Witness #2:

**WITNESS NAME** - Enter last name, first name, middle initial of the witness.

**JOB DESCRIPTION/TITLE** - Enter the job title/description assigned to the witness (e.g. carpenter, laborer, surveyor, etc.).

**EMPLOYED BY** - Enter the name of the employment company of the witness.

**SUPERVISORS NAME** - Enter name of immediate supervisor of the witness.

**ADDITIONAL WITNESSES** - Provide same information, as above, for each witnesses. Use additional pages if necessary.

## SECTION 4 - CONTRACTOR INFORMATION

**TYPE OF CONTRACT** - Mark appropriate box. A/E means architect/engineer. If "OTHER" is marked, specify type of contract on line provided.

**CONTRACT NUMBER/TITLE** - Enter complete contract number and title of prime contract (e.g. N62477-85-C-0100, 184 Pearl City Hsg. Revitalization).

**CONSTRUCTION INDUSTRIAL GROUP AND INDUSTRIAL TYPE** – This is the type of construction that will be done at this project.

1. First, you must choose the Industrial Group. You have 4 choices to choose from: (**NOTE!** Review of the Industrial Types below and knowing what the projects scope of work is will assist you in deciding what the Industrial Group should be.)

- a. Buildings
- b. Heavy Industrial
- c. Infrastructure
- d. Light Industrial

2. Once you have chosen the Industrial Group, you now select the Industrial Type. You have multiple choices under each Group, chose the one you feel fits the project most closely because on most projects there won't be an exact match:

- a. Buildings:
  - (1) Communications Ctr.
  - (2) Dormitory/Hotel
  - (3) High-rise Office
  - (4) Hospital
  - (5) Housing
  - (6) Laboratory
  - (7) Low-rise Office
  - (8) Maintenance Facility
  - (9) Parking Garage
  - (10) Physical Fitness Ctr.
  - (11) Restaurant/Nightclub
  - (12) School
  - (13) Warehouse
- b. Heavy Industrial:
  - (1) Chemical Mfg.
  - (2) Electrical (Generating)
  - (3) Environmental
  - (4) Metals Refining/Processing
  - (5) Mining
  - (6) Natural Gas Processing
  - (7) Oil Exploration/Production
  - (8) Oil Refining
  - (9) Pulp and Paper
- c. Infrastructure:
  - (1) Airport
  - (2) Electrical Distribution
  - (3) Flood Control
  - (4) Highway
  - (5) Marine Facilities
  - (6) Navigation
  - (7) Rail
  - (8) Tunneling
  - (9) Water/Wastewater
- d. Light Industrial:
  - (1) Automotive Assembly/Mfg.
  - (2) Consumer Products Mfg.
  - (3) Foods
  - (4) Microelectronics Mfg.
  - (5) Office Products Mfg.
  - (6) Pharmaceuticals Mfg.

**CONTRACTOR'S NAME/ADDRESS/PHONE NUMBER**

- (1) PRIME - Enter the exact name (title of firm), address, phone and fax numbers of the prime contractor.
- (2) SUBCONTRACTOR - Enter the exact name, address, phone and fax numbers of any subcontractor involved in the accident.

**SAFETY MANAGER'S NAME**

- (1) PRIME - Enter the name of the prime contractor safety manager.
- (2) SUBCONTRACTOR - Enter the name of the subcontractors safety manager.

**INSURANCE CARRIER**

- (1) PRIME - Enter the exact name/title of the prime's insurance company. Policy number not required.
- (2) SUBCONTRACTOR - Enter the exact name of the subcontractor's insurance company. Policy number not required.

**SECTION 5 - ACCIDENT DESCRIPTION**

**DATE OF ACCIDENT** - Enter the month, day, and year of accident.

**TIME OF ACCIDENT** - Enter the local time of accident in military time. Example: 14:30 hrs (not 2:30 p.m.).

**EXACT LOCATION OF ACCIDENT** - Enter facts needed to locate the accident scene (installation/project name, building/room number, street, direction and distance from closest landmark, etc.).

**DESCRIBE THE ACCIDENT IN DETAIL.** Fully describe the accident in the space provided. If property damage involved, give estimated dollar amount of damage and/or repair costs involved. If additional space is needed continue on a separate sheet and attach to this report. Give the sequence of events that describe what happened leading up to and including the accident. Fully identify personnel and equipment involved and their role(s) in the accident. Ensure that relationships between personnel and equipment are clearly specified. Ensure questions below regarding direct cause(s), indirect cause(s), and actions taken are answered. **NOTE!** Review questions in Section 7 below before completing.

**DIRECT CAUSE(S)** - The direct cause is that single factor which most directly lead to the accident. See examples below.

**INDIRECT CAUSE(S)** - Indirect cause are those factors, which contributed to, but did not directly initiate the occurrence of the accident.

Examples for Direct and Indirect Cause:

- 1. Employee was dismantling scaffold and fell 12 feet from unguarded opening.

*Direct cause:* Failure to provide fall protection at elevation

*Indirect causes:* Failure to enforce safety requirements: improper training/motivation of employee (possibility that employee was not knowledgeable of fall protection requirements or was lax in his attitude toward safety); failure to ensure provision of positive fall protection whenever elevated; failure to address fall protection during scaffold dismantling in phase hazard analysis.

2. Private citizen had stopped his vehicle at intersection for red light when vehicle was struck in rear by contractor vehicle. (note contractor vehicles was in proper safe working condition.)

*Direct cause:* Failure of contractor driver to maintain control of and stop contractor vehicle within safe distance.

*Indirect cause:* Failure of employee to pay attention to driving (defensive driving).

**ACTION(S) TAKEN TO PREVENT RE-OCCURRENCE OR PROVIDE ON-GOING CORRECTIVE ACTIONS.** Fully describe all the actions taken, anticipated, and recommended to eliminate the cause(s) and prevent reoccurrence of similar accidents/illnesses. Continue on back or additional sheets of paper if necessary to fully explain and attach to the complete report form.

**CORRECTIVE ACTION DATES -**

(1) Beginning - Enter the date when the corrective action(s) identified above will begin.

(2) Anticipated Completion - Enter the date when the corrective action(s) identified above will be completed.

**PERSONAL PROTECTIVE EQUIPMENT (PPE)** - Mark appropriate box(es) and list PPE which was being used by the injured person at the time of the accident (e.g. protective clothing, shoes, glasses, goggles, respirator, safety belt, harness, etc.)

**TYPE OF CONTRACTOR EQUIPMENT** - Enter the Serial Number, Model Number and specific type of equipment involved in the mishap (e.g. dump truck (off highway), crane (rubber tire), pump truck (concrete), etc.).

**WAS HAZARDOUS MATERIAL SPILLED/RELEASED?** - Mark appropriate block and list name(s) of any reportable quantities of hazardous materials spilled/released during the mishap.

**WHO PROVIDED FIRST AID OR CLEAN-UP OF MISHAP SITE?** - List name(s) of individual(s) and employer, if known.

**ANY BLOOD-BORNE PATHOGEN EXPOSURE, OTHER THAN EMT?** - Mark appropriate block and list name(s) of individual(s) and employer, if known.

**LIST OSHA AND/OR EM 385-1-1 STANDARDS THAT WERE VIOLATED.** - Self explanatory.

**WAS SITE SECURED AND WITNESS STATEMENT TAKEN IMMEDIATELY?** - Mark appropriate block and list by whom.

**SECTION 6 - INJURY/ILLNESS/FATALITY INFORMATION**

**SEVERITY OF INJURY/ILLNESS** – Mark appropriate box.

**ESTIMATED DAYS LOST** - Enter the estimated number of workdays the person will lose from work. Update when final data is known.

**ESTIMATED DAYS HOSPITALIZED** - Enter the estimated number of workdays the person will be hospitalized. Update when final data is known.

**ESTIMATED DAYS RESTRICTED DUTY** - Enter the estimated number of workdays the person, as a result of the accident, will not be able to perform all of their regular duties. Update when final data is known.

**BODY PART(S) AFFECTED** - Enter the most appropriate primary and when applicable, secondary, etc. body part(s) affected (e.g. arm: wrist: abdomen: single eye; jaw : both elbows: second finger: great toe: collar bone: kidney, etc.).

**NATURE OF INJURY/ILLNESS FOR PRIMARY BODY PART** - Enter the most appropriate nature of injury/illness (e.g. amputation, back strain, dislocation, laceration, strain, asbestosis, food poisoning, heart conditions, etc.).

**TYPE AND SOURCE OF INJURY/ILLNESS** - Type and Source Codes are used to describe what caused the incident.

(1) TYPE Code stands for an "Action" (Example: Worker, installing conduit, lost his balance and fell five feet from a ladder. Type Code: Fell different levels".) Select the most appropriate Type of injury from the list below:

**TYPE OF INJURY/ILLNESS**

STRUCK BY/AGAINST	CONTACTED CONTACTED WITH (INJURED PERSON MOVING) CONTACTED BY (OBJECT WAS MOVING)
FELL, SLIPPED, TRIPPED SAME LEVEL/DIFFERENT LEVEL/NO FALL	EXERTED LIFTED, STRAINED BY (SINGLE ACTION) STRESSED BY (REPEATED ACTION)
CAUGHT ON/IN/BETWEEN	EXPOSED INHALED/INGESTED/ABSORBED/EXPOSED TO
PUNCTURED, LACERATED PUNCTURED BY/CUT BY/STUNG BY/BITTEN BY	TRAVELING IN

(2) SOURCE Code stands for an "object or substance." (Example: Worker, installing conduit, lost his balance and fell five feet from a ladder. Source Code: "Ladder".) Select the most appropriate Source of injury from the list below:

**SOURCE OF INJURY/ILLNESS**

BUILDING OR WORKING AREA WALKING/WORKING AREA STAIRS/STEPS LADDER FURNITURE BOILER/PRESSURE VESSEL EQUIPMENT LAYOUT WINDOWS/DOORS ELECTRICITY	DUST, VAPOR, ETC. DUST (SILICA, COAT, ETC.) FIBERS ASBESTOS GASES CARBON MONOXIDE MIST, STEAM, VAPOR, FUME WELDING FUMES PARTICLES (UNIDENTIFIED)
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ENVIRONMENT CONDITION TEMPERATURE EXTREME (INDOOR) WEATHER (ICE, RAIN, HEAT, ETC.) <b>FIRE, FLAME, SMOTE (NOT TABACCO)</b> NOISE RADIATION LIGHT VENTILATION TOBACCO SMOKE STRESS (EMOTIONAL) CONFINED SPACE	CHEMICAL, PLASTIC, ETC. DRY CHEMICAL - CORROSIVE DRY CHEMICAL - TOXIC DRY CHEMICAL - EXPLOSIVE DRY CHEMICAL - FLAMMABLE LIQUID CHEMICAL - CORROSIVE LIQUID CHEMICAL - TOXIC LIQUID CHEMICAL - EXPLOSIVE LIQUID CHEMICAL - FLAMMABLE PLASTIC WATER MEDICINE
MACHINE OR TOOL HAND TOOL (POWERED: SAW, GRINDER, ETC.) HAND TOOL (NON POWERED) MECHANICAL POWER TRANSMISSION APPARATUS GUARD, SHIELD (FIXED, MOVEABLE, INTERLOCK) VIDEO DISPLAY TERMINAL PUMP, COMPRESSOR, AIR PRESSURE TOOL HEATING EQUIPMENT WELDING EQUIPMENT	INANIMATE OBJECT BOX, BARREL, ETC. PAPER METAL ITEM, MINERAL NEEDLE GLASS SCRAP, TRASH, WOOD FOOD CLOTHING, APPAREL, SHOES
MACHINE OR TOOL HAND TOOL (POWERED: SAW, GRINDER, ETC.) HAND TOOL (NON POWERED) MECHANICAL POWER TRANSMISSION APPARATUS GUARD, SHIELD (FIXED, MOVEABLE, INTERLOCK) VIDEO DISPLAY TERMINAL PUMP, COMPRESSOR, AIR PRESSURE TOOL HEATING EQUIPMENT WELDING EQUIPMENT	INANIMATE OBJECT BOX, BARREL, ETC. PAPER METAL ITEM, MINERAL NEEDLE GLASS SCRAP, TRASH, WOOD FOOD CLOTHING, APPAREL, SHOES
VEHICLE AS DRIVER OF PRIVATELY OWNED, RENTAL VEH. AS PASSENGER OF PRIVATELY OWNED, RENTAL VEH. DRIVER OF GOVERNMENT VEHICLE PASSENGER OF GOVERNMENT VEHICLE COMMON CARRIER (AIRLINE, BUS, ETC.) AIRCRAFT (NOT COMMERCIAL) BOAT, SHIP, BARGE	ANIMATE OBJECT DOG OTHER ANIMAL PLANT INSECT HUMAN (VIOLENCE) HUMAN (COMMUNICABLE DISEASE) BACTERIA, VIRUS (NOT HUMAN CONTACT)
MATERIAL HANDLING EQUIPMENT EARTHMOVER (TRACTOR, BACKHOE, ETC.) CONVEYOR (FOR MATERIAL AND EQUIPMENT) ELEVATOR, ESCALATOR, PERSONNEL HOIST HOIST, SLING CHAIN, JACK CRANE FORKLIFT HANDTRUCK, DOLLY	PERSONAL PROTECTIVE EQUIPMENT PROTECTIVE CLOTHING, SHOES, GLASSES, GOGGLES RESPIRATOR, MASK DIVING EQUIPMENT SAFETY BELT, HARNESS PARACHUTE

## SECTION 7 - CAUSAL FACTORS

Review thoroughly. Answer each question by marking the appropriate block. **NOTE!** If any answer is yes, explain in section 5 above.

- (1) **DESIGN** - Did inadequacies associated with the building or work site play a role? Would an improved design or layout of the equipment or facilities reduce the likelihood of similar accidents? Were the tools or other equipment designed and intended for the task at hand?
- (2) **INSPECTION/MAINTENANCE** - Did inadequately or improperly maintained equipment, tools, workplace, etc., create or worsen any hazards that contributed to the accident? Would better equipment, facility, work site or work activity inspections have helped avoid the accident?
- (3) **PERSONS PHYSICAL CONDITION** - Do you feel that the accident would probably not have occurred if the employee was in "good" physical condition? If the person involved in the accident had been in better physical condition, would the accident have been less severe or avoided altogether? Was overexertion a factor?
- (4) **OPERATION PROCEDURES** - Did lack of or inadequacy within established operating procedures contribute to the accident? Did any aspect of the procedures introduce any hazard to, or increase the risk associated with the work process? Would establishment or improvement of operating procedures reduce the likelihood of similar accidents?
- (5) **JOB PRACTICES** - Were any of the provisions of the Safety and Health Requirements Manual (EM 385-1-1) violated? Was the task being accomplished in a manner which was not in compliance with an established job hazard analysis or activity hazard analysis? Did any established job practice (including EM 385-1-1) fail to adequately address the task or work process? Would better job practices improve the safety of the task?
- (6) **HUMAN FACTORS** - Was the person under undue stress (either internal or external to the job)? Did the task tend toward overloading the capabilities of the person: i.e., did the job require tracking and reacting to many external inputs such as displays, alarms, or signals? Did the arrangement of the workplace tend to interfere with efficient task performance? Did the task require reach strengths, endurance, agility, etc., at or beyond the capabilities of the employee? Was the work environment ill-adapted to the person? Did the person need more training, experience, or practice in doing the task? Was the person inadequately rested to perform safely?
- (7) **ENVIRONMENTAL FACTORS** - Did any factors such as moisture, humidity, rain, snow, sleet, hail, ice, fog, cold, heat, sun temperature changes, wind, tides, floods, currents, terrain; dust, mud, glare, pressure changes, lighting, etc., play a part in the accident?

(8) **CHEMICAL AND PHYSICAL AGENT FACTORS** - Did exposure to chemical agents (either single shift exposure or long-term exposure such as dusts, fibers, (asbestos, etc.), silica, gases (carbon, monoxide, chlorine, etc.), mists, steam, vapors, fumes, smoke, other particulates, liquid or dry chemicals that are corrosive, toxic, explosive or flammable, by-products of combustion or physical agents such as noise, ionizing radiation, non-ionizing radiation (UV radiation created during welding, etc.) contribute to the accident/incident?

(9) **OFFICE FACTORS** - Did the fact that the accident occurred in an office setting or to an office worker have a bearing on its cause? For example, office workers tend to have less experience and training in performing tasks such as lifting office furniture. Did physical hazards within the office environment contribute to the hazard?

(10) **SUPPORT FACTORS** - Was the person using an improper tool for the job? Was inadequate time available or utilized to safely accomplish the task? Were less than adequate personnel resources (in terms of employee skills, number of workers, and adequate supervision) available to get the job done properly? Was funding available, utilized and adequate to provide proper tools, equipment, personnel, site preparation, etc.

(11) **PERSONAL PROTECTIVE EQUIPMENT** - Did the person fail to use appropriate personal protective equipment (gloves, eye protection, hard-toed shoes, respirator, etc) for the task or environment? Did protective equipment provided or worn fail to provide adequate protection from the hazard(s)? Did lack of or inadequate maintenance of protective gear contribute to the accident?

(12) **DRUGS/ALCOHOL** - Is there any reason to believe the person's mental or physical capabilities, judgment, etc., were impaired or altered by the use of drugs or alcohol? Consider the effects of prescription medicine and over the counter medications as well as illicit drug use. Consider the effect of drug or alcohol induced "hangovers".

(13) **JOB/ACTIVITY HAZARD ANALYSIS** - Was a written Job/Activity Analysis completed for the task being performed at the time of the accident? If one was made, did it address the hazard adequately or does it need to be updated? If none made, will one be made? These may also need to be addressed in the Corrective Actions Taken section. Mark the appropriate box. If one was made, attach a copy of the analysis to the report.

(14) **MANAGEMENT** - Did the lack of supervisor or management support play a part in the mishap? Mark the appropriate box.

## **SECTION - 8 OSHA INFORMATION - Complete this section if applicable**

### **SECTION 9 - REPORT PREPARER**

**Providing a completed CSIR to the Contracting Officer is the PRIME CONTRACTOR'S RESPONSIBILITY.** Enter the name, date of report, title, employer, phone number and signature of person completing the accident report and provide it to the Contracting Officer, or his representative, responsible for oversight of that contractor activity. **NOTE!** If prepared by other than the Prime Contractor, a person employed by the Prime Contractor must sign that they have reviewed and concur with the report and it's findings (e.g. company owner, project supervisor/foreman, Safety Officer, etc.).

**APPENDIX E**  
**MEDICAL DATA SHEET**

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This Medical Data Sheet is voluntary but recommended to be filled out by on-site personnel and kept in the command post by the SSHO during the conduct of site operations. This data sheet will accompany any personnel when medical assistance is needed or if transport to hospital facilities is required and the injured or affected worker is unable to effectively communicate with emergency medical staff.

Project \_\_\_\_\_  
Name \_\_\_\_\_ Home Telephone \_\_\_\_\_  
Address \_\_\_\_\_  
Age \_\_\_\_\_ Height \_\_\_\_\_ Weight \_\_\_\_\_  
Person to notify in the event of an emergency: Name: \_\_\_\_\_  
Phone: \_\_\_\_\_

Drug or other Allergies: \_\_\_\_\_

Particular Sensitivities: \_\_\_\_\_

Do You Wear Contacts? \_\_\_\_\_

What medications are you presently using? \_\_\_\_\_  
\_\_\_\_\_

Name, Address, and Phone Number of personal physician: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

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

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

---

\_\_\_\_\_  
Name (Print clearly)                      Signature                      Date

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## **APPENDIX F**

### **HAZARDOUS MATERIAL INVENTORY AND MATERIAL SAFETY DATA SHEETS/SAFETY DATA SHEETS**

(Preliminary and generic list, to be updated with TtEC and subcontractor inventory prior to mobilization)

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## **APPENDIX G**

### **CHEATHAM ANNEX EMERGENCY PROCEDURES PAMPHLET**

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# Emergency Phone Numbers

Naval Weapons Station Yorktown and  
Cheatham Annex

Fire and Rescue - Call - 757- 887- 4911  
(Do Not Call #911 from the Site or Field)

**Call # 911, when using NWSY Base land phones**

Police 757- 887- 4911

Utilities Trouble 757- 445- 6868

Hot Work Permits – (Fire Marshal) -757-613-8194  
(Office) - 757-847-7873

Base Explosive Safety Dept. – 887-4661

Report Safety and Security Incidents  
Immediately

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