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FINAL WORK PLAN ABOVEGROUND STORAGE TANK (AST) REMOVALS MCB CAMP  
LEJEUNE NC  
10/01/2014  
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. WE21**

**FINAL  
WORK PLAN  
AST REMOVALS**

**MARINE CORPS INSTALLATIONS EAST - MARINE CORPS BASE CAMP LEJEUNE  
JACKSONVILLE, NORTH CAROLINA**

**October 2014**

*Prepared for*



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## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION.....</b>	<b>1</b>
1.1	Scope.....	1
1.2	Site Description and Proposed Removal Activities .....	1
1.3	Report Organization.....	3
<b>2.0</b>	<b>PROJECT ORGANIZATION.....</b>	<b>3</b>
2.1	Key Project Personnel.....	3
2.1.1	Project Manager .....	3
2.1.2	Project Superintendent .....	4
2.1.3	Project Quality Control Manager.....	4
2.1.4	Site Safety and Health Officer .....	4
2.2	Subcontractors.....	4
2.3	Meetings and Reports .....	4
2.4	Project Schedule.....	5
<b>3.0</b>	<b>FIELD ACTIVITIES.....</b>	<b>5</b>
3.1	Mobilization and Site Setup.....	5
3.1.1	Mobilization of Personnel and Equipment .....	5
3.1.2	Utility Mark-out .....	5
3.1.3	Site Plan .....	6
3.1.4	Temporary Erosion Control Installation .....	6
3.1.5	Traffic Plan .....	6
3.2	AST and Above Ground Piping Removal .....	6
3.3	Removal and Abandonment of Underground Piping – Site G650, Camp Geiger..	8
3.3.1	Soil Excavation .....	8
3.4	Building Hazardous Substance Survey, Demolition, and Removal .....	9
3.5	Waste Management.....	9
3.6	Site Restoration.....	10
3.7	Demobilization.....	10
<b>4.0</b>	<b>POST-CONSTRUCTION REPORTING.....</b>	<b>10</b>
<b>5.0</b>	<b>REFERENCES.....</b>	<b>10</b>

## LIST OF TABLES

Table 3-1. AST Removal Details.....	7
-------------------------------------	---

## LIST OF FIGURES

Figure 1	Site Location Map
Figure 2	Site Plan – Site RR15, Stone Bay
Figure 3	Site Plan – Site G650, Camp Geiger

Figure 4	Site Plan – Site AS4151, MCAS New River
Figure 5	Site Plan – Site HP1700, Main
Figure 6	Traffic Plan – Site RR15, Stone Bay
Figure 7	Traffic Plan – Site G650, Camp Geiger
Figure 8	Traffic Plan – Site AS4151, MCAS New River
Figure 9	Traffic Plan – Site HP1700, Main

## **LIST OF APPENDICES**

Appendix A	Photographs
Appendix B	SDS, Tri-Act 1820
Appendix C	Accident Prevention Plan
Appendix D	Contractor Quality Control Plan
Appendix E	Project Schedule
Appendix F	Environmental Protection Plan
Appendix G	MCIEAST-MCBCAMLEJ Waste Management Plan

## ACRONYMS AND ABBREVIATIONS

APP	Accident Prevention Plan
AST	Aboveground Storage Tank
ATG	Automatic Tank Gauge
CAMLEJ	Camp Lejeune
CPR	Contractor Production Report
CQCP	Construction Quality Control Plan
CTO	Contract Task Order
EMD	Environmental Management Division
EPP	Environmental Protection Plan
LEL	Lower Explosive Limit
MCAS	Marine Corps Air Station
MCB	Marine Corps Base
MCIEAST	Marine Corps Installations East
NAVFAC	Naval Facilities Engineering Command
Navy	Department of the Navy
NCDENR	North Carolina Department of Environment and Natural Resources
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
O <sub>2</sub>	oxygen
OICC	Officer In Charge of Construction
PM	Project Manager
POC	Point of Contact
PQCM	Project QC Manager
QC	Quality Control
QCPM	QC Program Manager
RAC	Remedial Action Contract
RPM	Remedial Project Manager
SDS	Safety Data Sheet
SOW	Scope of Work
SPCC	Spill Prevention, Control, and Countermeasure
SSHO	Site Safety and Health Officer
T&D	Transportation and Disposal
TtEC	Tetra Tech EC, Inc.
ULSD	Ultra Low Sulfur Diesel Fuel
UST	Underground Storage Tank
WMP	Waste Management Plan
WP	Work Plan

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## **1.0 INTRODUCTION**

Tetra Tech EC, Inc. (TtEC) has been contracted by the Department of the Navy (Navy), Naval Facilities Engineering Command (NAVFAC) Atlantic, under Remedial Action Contract (RAC) N62470-13-D-8007, Contract Task Order (CTO) WE21 to perform removal of above ground storage tanks (ASTs) at Marine Corps Installations East (MCIEAST) Marine Corps Base (MCB) Camp Lejeune (CAMLEJ) and Marine Corps Air Station (MCAS) New River complex. This Work Plan (WP) has been prepared based on the Scope of Work (SOW) dated February 11, 2014, Revised, May 28, 2014, and the TtEC Basis of Estimate and Proposal-Revised dated June 11, 2014. This WP details the approach to complete the AST removals in accordance with the SOW and the North Carolina Department of Environment and Natural Resources (NCDENR) guidance.

### **1.1 Scope**

Numerous fuel storage tanks are in operation aboard the MCB and MCAS complex. The tanks are subject to various state and federal environmental regulatory requirements and may also require certain specific permits. A steam plant operated by MCB (Building AS-4151), includes four ASTs that were taken out of service. There is no plan to reuse the ASTs associated with the steam plant. Various other ASTs at the installation have reached their service life and are no longer needed. These tanks, as well as their associated piping systems, shall be removed per all applicable federal and state regulatory requirements. As part of this project TtEC will remove seven ASTs. These actions will be performed in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), the NCDENR non-underground storage tank (UST) regulations, and the Federal Spill Prevention, Control, and Countermeasure (SPCC) requirements found in the Code of Federal Regulations (CRF), title 40, section 112.

The main work tasks included in the scope are listed below.

- Mobilization and Site Setup
- Utility Mark-out and Temporary Erosion and Sediment Control Installation
- ASTs and Above Ground Piping Removal
- Removal and Abandonment of Underground Piping
- Building Hazardous Substance Survey, Demolition, and Removal
- Waste Management
- Site Restoration
- Demobilization

### **1.2 Site Description and Proposed Removal Activities**

The AST sites are located at MCIEAST-MCBCAMLEJ, which is a 156,000-acre facility located in Onslow County, North Carolina, adjacent to the southern side of the City of Jacksonville

(Figure 1). The mission of the camp is to maintain combat-ready units for expeditionary deployment. The base provides housing, training facilities, and logistical support for Fleet Marine Force Units and other assigned units.

The following describes each AST removal area and the proposed removal activities. It is assumed that none of the tanks, except the AST at Site HP1700, contain hazardous materials. Appendix A provides photographs and details pertinent to the removal activities. Additional details on the removal activities are provided in Section 3.0 of this WP.

One 1,000 gallon AST will be removed from Site RR15 at Stone Bay (Figure 2). The AST appears to be a double wall horizontal steel tank on a concrete pad and it is surrounded by bollards. This tank contained Ultra Low Sulfur Diesel Fuel (ULSD). If present, any fuel/product will be removed from the tank and pipes before dismantling. The tank and associated above ground piping will then be loaded onto a utility trailer and moved to the Camp Geiger site for cleanout, demolition, and subsequent disposal/recycling. The bollards and a concrete pad will also be removed for disposal/recycling.

Two ASTs will be removed from Site G650 at Camp Geiger (Figure 3). The ASTs appear to be single-walled field erected vertical ASTs, each with a capacity of 60,000 gallons. Both tanks are contained within a joint concrete secondary containment area. These tanks contained ULSD. The tanks and associated piping (above and below ground) in need of removal will be drained and cleaned appropriately prior to the removal and subsequent disposal/recycling activities. The underground piping associated with these ASTs is to be removed (or abandoned in place) from the tank containment area to a small brick building. The concrete containment area or fuel transfer pad will not be removed and it is anticipated that the tanks can be removed with the containment in place. Finally, a small brick building and associated piping (including a remote fill) will be demolished and removed for disposal or recycling, as appropriate. During the building demolition, the concrete sidewalk and the concrete box at the end of the sidewalk will be removed for disposal/recycling.

Site AS4151 is a steam generation facility located in the MCAS New River area (Figure 4). Three ASTs will be removed from Site AS4151. Each AST has a capacity of 100,000 gallons and previously contained ULSD. Each AST appears to be a single walled field erected vertical tank, and each is within its own concrete secondary containment. The walls of the concrete containment will be saw cut and removed to allow access to the ASTs. Repair or replacement of the wall section will not be completed. The tanks and associated piping will be drained and cleaned appropriately prior to the removal and subsequent disposal/recycling activities. The piping (above ground) is to be removed from the ASTs to a transfer pump and associated steam plant building. The steam piping follows the same path as the AST piping however, the steam piping will remain intact and in place. Above ground electrical conduit will be removed and disposed/recycled. The wooden and metal stairs will remain in place. A 20,000 gallon AST (AS4151) was previously removed under a separate task order.

One 1,000 gallon AST will be removed from Site HP1700 at the Main-Side area (Figure 5). The ASTs appears to be single walled shop fabricated vertical AST within its own steel secondary containment. The AST previously contained Tri-Act 1820, a corrosion inhibitor. The Safety Data Sheet (SDS) is provided in Appendix B. The remaining corrosion inhibitor and rinsate water will be removed during tank and above ground pipe cleanout and disposed of as hazardous waste. It is anticipated that the AST and piping, once cleaned, will be classified as non-hazardous waste and disposed of or recycled appropriately. The steel containment will be removed for off-site disposal/recycling. No concrete pad or bollards are to be removed.

### **1.3 Report Organization**

The remainder of this WP is organized as follows:

- Section 2.0 addresses project management and schedule.
- Section 3.0 describes field activities to meet the project objectives.
- Section 4.0 describes post-construction reporting requirements.
- Section 5.0 provides a list of references used to create this document.
- Appendix A presents photographs with pertinent project details.
- Appendix B presents the SDS for the Tri-Act 1820.
- Appendix C includes the Accident Prevention Plan (APP).
- Appendix D includes the Contractor Quality Control Plan (CQCP).
- Appendix E presents the project schedule.
- Appendix F includes the Environmental Protection Plan (EPP).
- Appendix G includes the MCIEAST-MCBCAMLEJ Waste Management Plan (WMP).

## **2.0 PROJECT ORGANIZATION**

### **2.1 Key Project Personnel**

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

#### **2.1.1 Project Manager**

The PM will ensure compliance with the SOW and is the 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 the 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, interfacing with Base personnel, and applying for necessary permits. The Project Superintendent is responsible for conformance of all site work with requirements and procedures identified in the WP, APP (Appendix C), and CQCP (Appendix D). In addition, the Project Superintendent will complete a daily Contractor Production Report (CPR).

### 2.1.3 Project Quality Control Manager

The Project QC Manager (PQCM) is responsible for implementation of the CQCP and reports directly to the Quality Control Program Manager (QCPM). The PQCM will conduct the three phases of inspection, conduct surveillances of site activities, prepare daily QC reports, and conduct QC meetings. In addition, the PQCM will attend the final site inspection with the Navy and ensure that outstanding items are addressed. 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. The SSHO will oversee 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, utility survey, AST removal, transportation and disposal (T&D) of waste, and site restoration. TtEC will subcontract Cape, Inc. to provide the AST removal tasks for this project.

## 2.3 **Meetings and Reports**

Prior to the start of construction activities, a preconstruction and mutual understanding meeting will be attended by TtEC representatives to: discuss the planned work activities and schedule; establish lines of communication; address Base and site access requirements; address site logistics; confirm work hours; review QC and reporting requirements; and discuss other pertinent site information.

QC meetings will be conducted at least every two weeks and invitees will include representatives from the Officer In Charge of Construction (OICC), MCIEAST-MCBCAMLEJ Environmental

Management Division (EMD), NAVFAC, TtEC, and any other pertinent personnel. The TtEC PQCM will prepare and distribute the meeting agenda and minutes.

Daily CPRs and QC Reports will be completed by 1000 hrs the following day and distributed to the OICC, EMD, NAVFAC Remedial Project Manager (RPM), and other pertinent personnel as required.

Reports prepared as part of the pre-construction planning effort include a WP, APP, CQCP, and EPP. The APP, CQCP, and EPP are provided as appendices to this WP, as noted in Section 1.3.

At the conclusion of work activities at each site, a Completion Report will be prepared and submitted as described in Section 4.0.

## **2.4 Project Schedule**

The project schedule is provided as Appendix E.

## **3.0 FIELD ACTIVITIES**

This section details the activities that will be implemented by TtEC and its subcontractors. Field activities include mobilization and site setup, AST and pipe removal, building survey and demolition, T&D of waste, site restoration, and demobilization. The EPP is presented as Appendix F and provides protocols and best practices to mitigate impacts to the environment during the implementation of field activities.

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

#### **3.1.1 Mobilization of Personnel and Equipment**

Project personnel, equipment, materials, and temporary facilities will be mobilized to MCIEAST-MCBCAMLEJ as needed to execute the project activities. Temporary facilities may include an office trailer, tool trailer, mobile generator, port-a-jons, hand wash stations, and a dumpster for general trash service. TtEC employees and subcontractors will comply with security requirements upon mobilization and throughout the course of the project. Only one mobilization to MCIEAST-MCBCAMLEJ will be required for this project. Movement of personnel and equipment between the project work areas will be performed as dictated by the work activities.

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

A utility mark-out will be completed for each site prior to performing any ground disturbing activities. North Carolina 811 will be notified and provided a minimum notice of 72 hours to complete a utility mark-out of the required areas. 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. At the AST removal sites, the electrical supply to the existing tank monitoring systems and dispensers will be identified and disconnected (or existing disconnect will be verified) by a licensed electrician prior to beginning removal activities.

### 3.1.3 Site Plan

The proposed site plans are included as Figures 2 through 5. The site plans identify the work areas, support areas, and material staging areas that will be used during the field activities. High-visibility fencing, barriers, and signage will be used to restrict access to each site, as necessary. Site control measures will vary depending on the work location and the activities being performed. Proposed locations for the support and material staging areas will be subject to approval by the OICC.

### 3.1.4 Temporary Erosion Control Installation

Because the total land disturbance associated with this project is less than one acre, a formal Erosion and Sediment Control Plan and Stormwater Pollution Prevention Plan are not required. However, temporary erosion controls will be used in order to protect the surrounding land and water resources at each site. Control measures to be used may include down gradient silt fence, drain inlet protection, dust control, poly-sheeting underneath and covering waste soil stockpiles, and hay bales surrounding material stockpiles. Controls will be installed and maintained in accordance with the North Carolina Erosion and Sediment Control Field Manual.

### 3.1.5 Traffic Plan

The activities associated with this project will require transportation of materials and equipment to/from each site by haul trucks. To safely accommodate the truck traffic, on-site traffic patterns will be established, spotters will be used, and signage will be placed as appropriate. In addition, deliveries will be scheduled within the hours of site operation and trucks will follow an approved route to minimize traffic disruption. Figures 6 through 9 present the proposed traffic plans for the routing of personnel and vendor material/equipment delivery traffic to each of the sites.

In addition, at Site G650, Camp Geiger, the road used by the steam plant personnel will be impacted by underground pipe abandonment activities. Appropriate traffic controls will be utilized during work impacting the road or adjacent to the road. The Navy will be notified at least 2 weeks prior to road area work so that steam plant personnel can be notified.

## **3.2 AST and Above Ground Piping Removal**

ASTs will be removed from a total of four sites. While the sizes of the ASTs vary, the same general removal procedure outlined in this section will be followed at each site. Table 3-1 details ASTs and estimated piping to be removed from each site. The management of wastes

generated at the AST removal sites is discussed in Section 3.5. Restoration activities are discussed in Section 3.6.

**Table 3-1. AST Removal Details**

Site ID	Tank ID	AST Capacity	AST Contents	Linear Feet of Piping
RR15	RR15-03A	1,000	Ultra Low Sulfur Diesel Fuel	<10
G650	SG650-01A	60,000	Ultra Low Sulfur Diesel Fuel	190 total
G650	SG650-02A	60,000	Ultra Low Sulfur Diesel Fuel	
AS4151	AS4152A	100,000	Ultra Low Sulfur Diesel Fuel	770 total
AS4151	AS4153A	100,000	Ultra Low Sulfur Diesel Fuel	
AS4151	AS4154A	100,000	Ultra Low Sulfur Diesel Fuel	
HP1700	1700	1,000	Tri-ACT 1820 (corrosion inhibitor)	<10

Based on information provided by the Navy, all ASTs have been emptied except AST 1700-05P (contains residual Tri-Act 1820). Following completion of site setup, any product/fuel or residual remaining in the piping will be drained into the AST or will be removed using a vacuum truck. The tank will then be triple rinsed and the resulting product/fuel and water mix will be removed using a vacuum truck. The handling and disposal of waste materials is discussed further in Section 3.5.

The atmosphere inside the tank will be monitored with an oxygen (O<sub>2</sub>/lower explosive limit (LEL) meter for oxygen and flammable vapors. If the atmosphere is determined to be in excess of 8% oxygen and/or 10% LEL the tank will be inerted using dry ice, nitrogen gas, or argon gas prior to performing any cutting activities. At a minimum, holes will be cut in the sides of the tank prior to sending it for off-site disposal/recycling. Additional cutting/sizing of the tank and piping may be performed to facilitate transportation and disposal/recycling. Confined space entry may be necessary for ULSD AST cleanout and additional monitoring and confined space entry requirements are detailed in the APP. No person shall enter a tank unless the proper confined space entry requirements are implemented. No entry of the AST at Site HP1700 will be conducted because the tank contained Tri-act 1820, and this is considered a hazardous substance/waste.

Electrical conduits including Automatic Tank Gauge (ATG) conduits, annunciator conduits, pump power supply or control conduits, low or high voltage controls will not be removed. These components will be cut and terminated at the sidewalls of the containment structures. Electrical conduit that is above ground, accessible, and not in use will be removed.

If during AST or pipe removal, any visual evidence of a previous fuel/product leak is encountered, TtEC will immediately notify EMD and OICC to determine if soil removal and/or

sampling are necessary. NCDENR Guidelines for Initial Response and Abatement, Assessment, and Corrective Action for Non-UST Releases of Petroleum will be used in the event of identification of a release.

### **3.3 Removal and Abandonment of Underground Piping – Site G650, Camp Geiger**

Following completion of site setup and removal of the ASTs at site G650, underground piping associated with these ASTs will be removed or abandoned in place from the tank containment area to a small brick building. In general, below ground piping will be removed by excavation of the overburden and removal of the piping. However, to avoid disturbing the road, pipe that runs under the road to the building will be properly abandoned in place instead of removed. Pulling the length of pipe from under the road could create a void and road settlement. The pipe under the road will be exposed on each side of the road by excavating. The pipe will then be cut at both ends of the road, and then concrete will be used to plug each end.

A temporary staging area lined with polyethylene will be constructed near the excavation where the removed piping will be placed for decontamination and staging prior to disposal/recycling. Excavated soil will also be staged in this area and covered with polyethylene until reuse as on-site backfill. All decontamination water will be collected and managed as outlined in Section 3.5.

#### **3.3.1 Soil Excavation**

A back-hoe or trackhoe will be used to excavate the soil and remove/expose the piping. Removal of soil using hand tools will be used when dictated by tight excavation areas, the presence of utilities, or other subsurface structures. It is not anticipated that groundwater will be present in the excavation; however, if substantial free product or contaminated groundwater is encountered during the removal process, it will be promptly removed through the use of a vacuum truck for subsequent disposal. If water is encountered that does not appear to be contaminated it will be left in the excavation unless its removal will aid in the removal process. In that case, it will be removed via vacuum truck for subsequent disposal.

Once the piping has been removed/abandoned, inspection will be conducted to determine if petroleum-contaminated soil is present in the excavation through visual inspection. The excavated soil will also be visually inspected for contamination (i.e., staining). It is anticipated that based on the field inspection, the excavated soil will be used on-site as backfill. If visual observation indicates a previous fuel/product leak or stained soil, TtEC will immediately notify EMD and OICC to determine if soil removal and/or sampling are necessary, as neither is part of this scope. NCDENR Guidelines for Initial Response and Abatement, Assessment, and Corrective Action for Non-UST Releases of Petroleum will be used in the event of identification of a release.

### **3.4 Building Hazardous Substance Survey, Demolition, and Removal**

A small brick building and associated piping (including a remote fill) will be demolished at site G650, Camp Geiger. A hazardous substance survey will be conducted for the building, including interior and exterior, prior to commencing demolition and removal activities. Though not anticipated, hazardous materials associated with this structure will be removed and disposed in accordance with appropriate regulations and guidance. The building demolition will be conducted by using a backhoe and track hoe with a thumb. During the building demolition, the concrete sidewalk and the concrete box at the end of the sidewalk will be removed for disposal/recycling. The building and concrete debris will be loaded into roll off containers for staging and subsequent disposal/recycling. Care will be taken to not generate dust, and if dust is visible, it will be controlled by wetting down with water.

### **3.5 Waste Management**

All waste generated on-site will be managed in accordance with the MCIEAST-MCBCAMLEJ Waste Management Plan (Appendix G). Potential waste streams include: removed concrete and asphalt; AST tanks, piping, and accessories; mixed product/fuel and water; excavation water; potentially hazardous materials associated with the building; and construction debris from the building demolition. All waste is anticipated to be non-hazardous with the exception of the corrosion inhibitor and rinse water (containing Tri-Act 1820) and any hazardous materials identified at the Camp Geiger brick building. Waste characterization sampling, though not anticipated, may be performed on wastes as required by the disposal facility, the MCIEAST-MCBCAMLEJ Waste Management Plan, and NCDENR. The final disposition of the waste streams will be documented via bill of lading or waste manifest.

Removed concrete, asphalt, and potentially recyclable construction debris from the building demolition will be broken into manageable sized pieces and based upon type of material, be transported to an appropriate disposal or recycling facility. Any protruding rebar will be cut from the concrete prior to transport. Any non-recyclable construction debris/trash will be disposed of at an appropriate off-base disposal facility.

The removed former ASTs, along with their associated piping and accessories, will be triple rinsed, cut/broken into manageable sized pieces, and segregated based on their material of construction. Metal items will be transported to an off-base recycling facility. Non-metal (i.e. fiberglass and plastic) items will be transported to an appropriate disposal or recycling facility.

Mixed product/fuel and water will be collected at each site in a vacuum truck. Because the project sites (except Site HP1700) are not expected to contain non-petroleum related contaminants, no characterization sampling will be performed. Waste water (excluding the Tri-Act 1820 waste water) will be transported directly to a facility permitted to treat or dispose of mixed product/fuel and water. Waste water containing Tri-Act 1820 will be transported directly

to a facility permitted to treat and/or dispose of the hazardous waste. As previously discussed, it is not anticipated that water will be encountered or removed from the excavation at site G650.

It is anticipated that excavated soil from site G650 will be reused on-site as backfill unless visual inspection indicates contamination as detailed in Section 3.3.1.

### **3.6 Site Restoration**

Site restoration includes activities associated with returning each site to suitable conditions. The excavation area at site G650 (Camp Geiger) will be backfilled using on-site soil (i.e., non-contaminated excavated soil) and/or imported soil provided by Riverside Sand Company, Inc. located in Wallace, North Carolina. Because Riverside Sand Company borrow pits are permitted through the NCDENR Mining Program, no clean fill verification sampling will be performed on imported backfill.

Soil will be placed in multiple lifts and each lift will be compacted using field equipment. A layer of topsoil will be placed above the backfill to match the surrounding grade. All areas that were disturbed during construction activities will be regraded to promote drainage and seeded with a drought-resistant, low maintenance local seed mixture. Straw will be spread over seeded areas as appropriate. Temporary erosion control measures will be removed from each site after vegetation has been established. Asphalt or concrete are not anticipated to require replacement at the project sites.

### **3.7 Demobilization**

Upon completion of the activities and acceptance of each site by the Navy, demobilization activities will commence. Demobilization includes removal of temporary facilities and demobilization of personnel, equipment, and materials. Site personnel will demobilize according to project needs, as determined by the PM.

## **4.0 POST-CONSTRUCTION REPORTING**

A Completion Report will be prepared and submitted in Draft and Final versions. The report will include waste manifests, daily CPRs documenting field activities, and other pertinent project information.

## **5.0 REFERENCES**

NAVFAC Mid-Atlantic. Scope of Work-Revised. Above Storage Tanks (ASTs), at. Marine Corps Base Camp Lejeune, NC. Prepared for Tetra Tech EC, Inc. May 28, 2014.

NCDENR, Guidelines for Initial Response and Abatement, Assessment, and Corrective Action for Non-UST Releases of Petroleum. July 1, 2012.

Tetra Tech EC, Inc. Basis of Estimate and Proposal-Revised. RRP XE21 – Above Ground Storage Tank Removals at. Marine Corps Base Camp Lejeune, Jacksonville, NC. Prepared for Naval Facilities Engineering Command Mid-Atlantic. June 11, 2014.

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## **FIGURES**

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**BASE LOCATION MAP**

**LEGEND:**

AST – Above Ground Storage Tank

SOURCE: GOOGLE EARTH PRO

CAD FILE: WE21 - FIGURE 1.DWG

**MARINE CORPS INSTALLATIONS EAST - MARINE CORP BASE CAMP LEJEUNE**

**AST REMOVALS  
SITE LOCATION MAP**

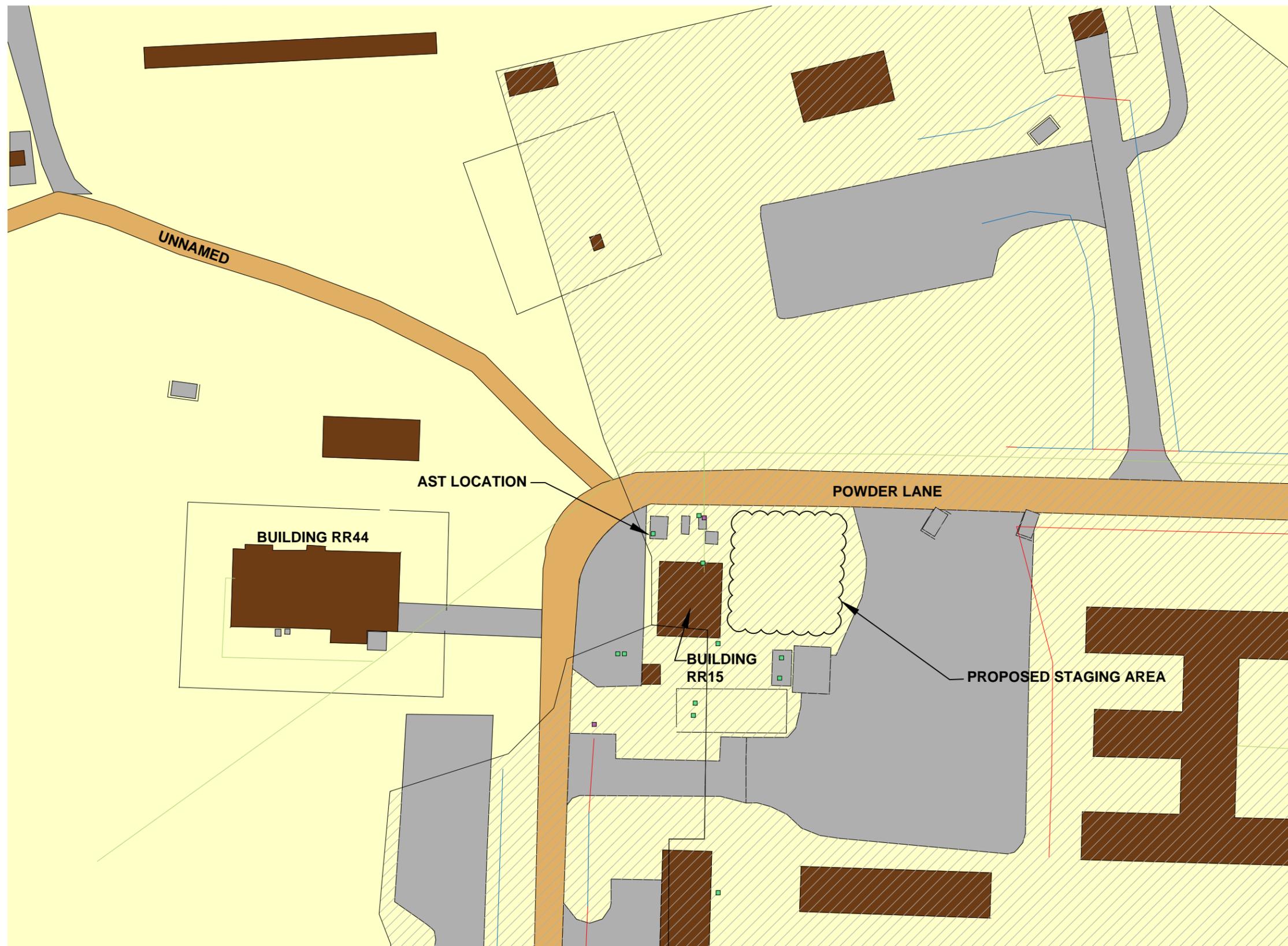


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PREP	CHK	APPR	DATE

**FIGURE  
1**

CAD\_FILE: WE21-FIGURE\_2\_SITE\_RR15.DWG



**LEGEND**

- wstewat\_oil\_wat\_separatr\_point
- wastewater\_line
- vehicle\_parking\_area
- vehicle\_driveway\_area
- underground\_storage\_tank\_point
- surface\_water\_course\_area
- slab\_area
- structure\_existing\_area
- storm\_sewer\_reservoir\_area
- road\_area
- mooring\_facility\_area
- storm\_sewer\_line
- stmswr\_drainage\_basin\_area
- fence\_line
- ditch\_aqueduct\_centerline
- aboveground\_storage\_tank\_point



SOURCE: MARINE CORP INSTALLATIONS EAST MARINE CORPS BASE CAMP LEJEUNE GIS

**MARINE CORPS INSTALLATIONS EAST - MARINE CORP BASE CAMP LEJEUNE  
AST REMOVALS  
SITE RR15, STONE BAY SITE PLAN**

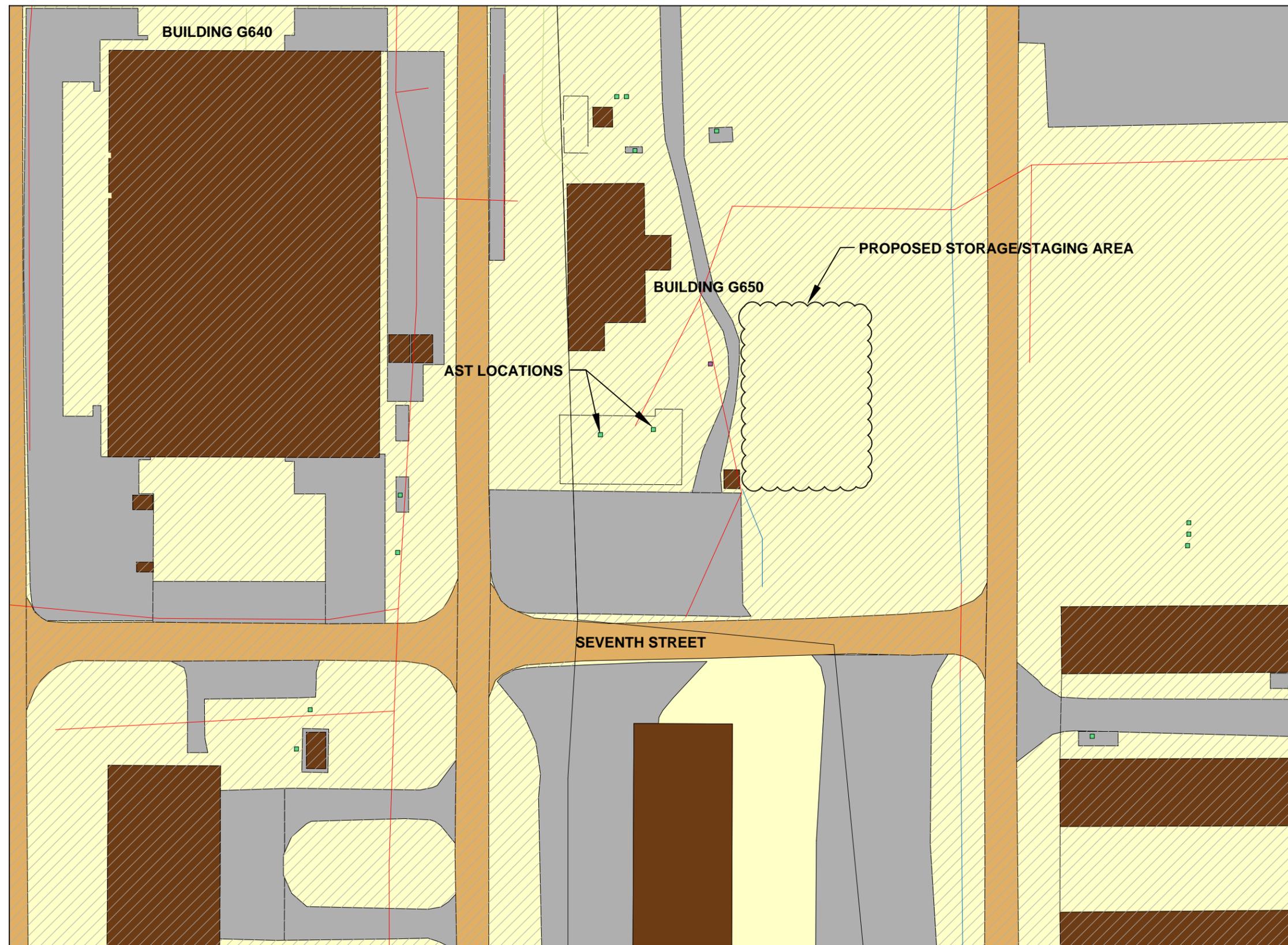


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PREP	CHK	APPR	DATE

**FIGURE  
2**

CAD FILE: WE21-FIGURE\_3\_SITE\_G650.DWG



- LEGEND**
- wstewat\_oil\_wat\_separatr\_point
  - wastewater\_line
  - vehicle\_parking\_area
  - vehicle\_driveway\_area
  - underground\_storage\_tank\_point
  - slab\_area
  - structure\_existing\_area
  - storm\_sewer\_reservoir\_area
  - road\_area
  - storm\_sewer\_line
  - stmswr\_drainage\_basin\_area
  - fence\_line
  - ditch\_aqueduct\_centerline
  - aboveground\_storage\_tank\_point



SOURCE: MARINE CORP INSTALLATIONS EAST MARINE CORPS BASE CAMP LEJEUNE GIS

**MARINE CORPS INSTALLATIONS EAST - MARINE CORP BASE CAMP LEJEUNE  
AST REMOVALS  
SITE G650, CAMP GEIGER SITE PLAN**

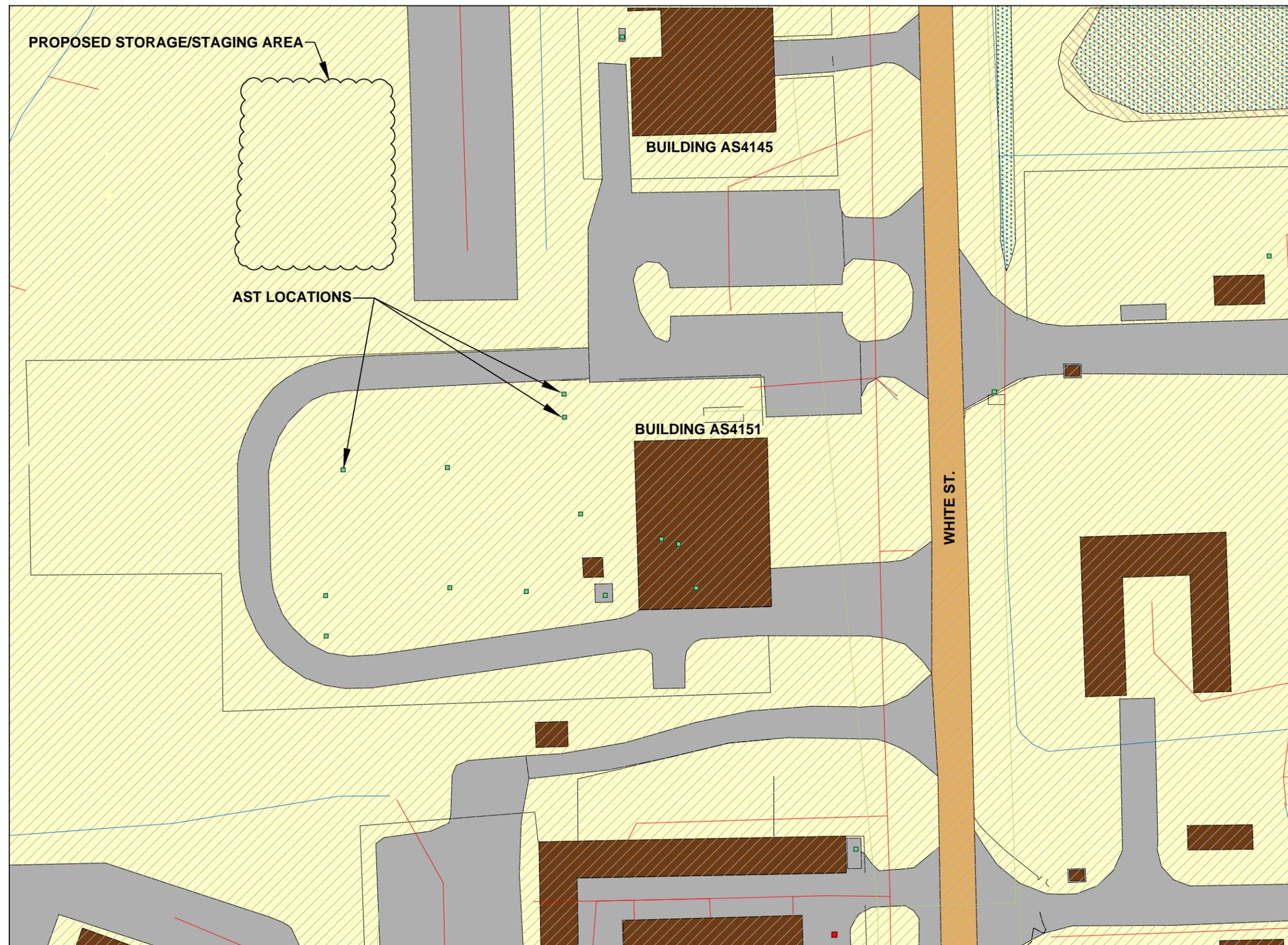
PREP	CHK	APPR	DATE

**FIGURE  
3**



TETRA TECH EC, INC.

CAD FILE: WE21-FIGURE 4 SITE AS4151.DWG



- LEGEND**
- wstewat\_oil\_wat\_separatr\_point
  - wastewater\_line
  - vehicle\_parking\_area
  - vehicle\_driveway\_area
  - underground\_storage\_tank\_point
  - surface\_water\_body\_area
  - slab\_area
  - structure\_existing\_area
  - storm\_sewer\_reservoir\_area
  - road\_area
  - mooring\_facility\_area
  - storm\_sewer\_line
  - stmswr\_drainage\_basin\_area
  - fence\_line
  - ditch\_aqueduct\_centerline
  - aboveground\_storage\_tank\_point



SOURCE: MARINE CORP INSTALLATIONS EAST MARINE CORPS BASE CAMP LEJEUNE GIS

**MARINE CORPS INSTALLATIONS EAST - MARINE CORP BASE CAMP LEJEUNE**  
**AST REMOVALS**  
 SITE AS4151, MCAS NEW RIVER  
 SITE PLAN



TETRA TECH EC, INC.

PREP	CHK	APPR	DATE

**FIGURE**  
**4**

CAD\_FILE: WE21-FIGURE\_5\_SITE\_HP1700.DWG



- LEGEND**
- wstewat\_oil\_wat\_separatr\_point
  - wastewater\_line
  - vehicle\_parking\_area
  - vehicle\_driveway\_area
  - slab\_area
  - structure\_existing\_area
  - storm\_sewer\_reservoir\_area
  - road\_area
  - storm\_sewer\_line
  - stmswr\_drainage\_basin\_area
  - railroad\_centerline
  - fence\_line
  - ditch\_aqueduct\_centerline
  - aboveground\_storage\_tank\_point



SOURCE: MARINE CORP INSTALLATIONS EAST MARINE CORPS BASE CAMP LEJEUNE GIS

**MARINE CORPS INSTALLATIONS EAST - MARINE CORP BASE CAMP LEJEUNE  
AST REMOVALS  
SITE HP1700, MAIN SIDE SITE PLAN**

PREP	CHK	APPR	DATE

**FIGURE  
5**



CAD FILE: WE21-FIGURE 6-RR15.DWG



LEGEND:

— TRAFFIC ROUTE

SOURCE: GOOGLE EARTH PRO

MARINE CORPS INSTALLATIONS EAST - MARINE CORP BASE CAMP LEJEUNE  
**AST REMOVALS**  
 SITE RR15, STONE BAY  
 TRAFFIC PLAN

PREP	CHK	APPR	DATE

FIGURE 6



TETRA TECH EC, INC.



LEGEND:  
 TRAFFIC ROUTE

SOURCE: ESRI MAPS

CAD FILE: WE21-FIGURE 7-G650.DWG

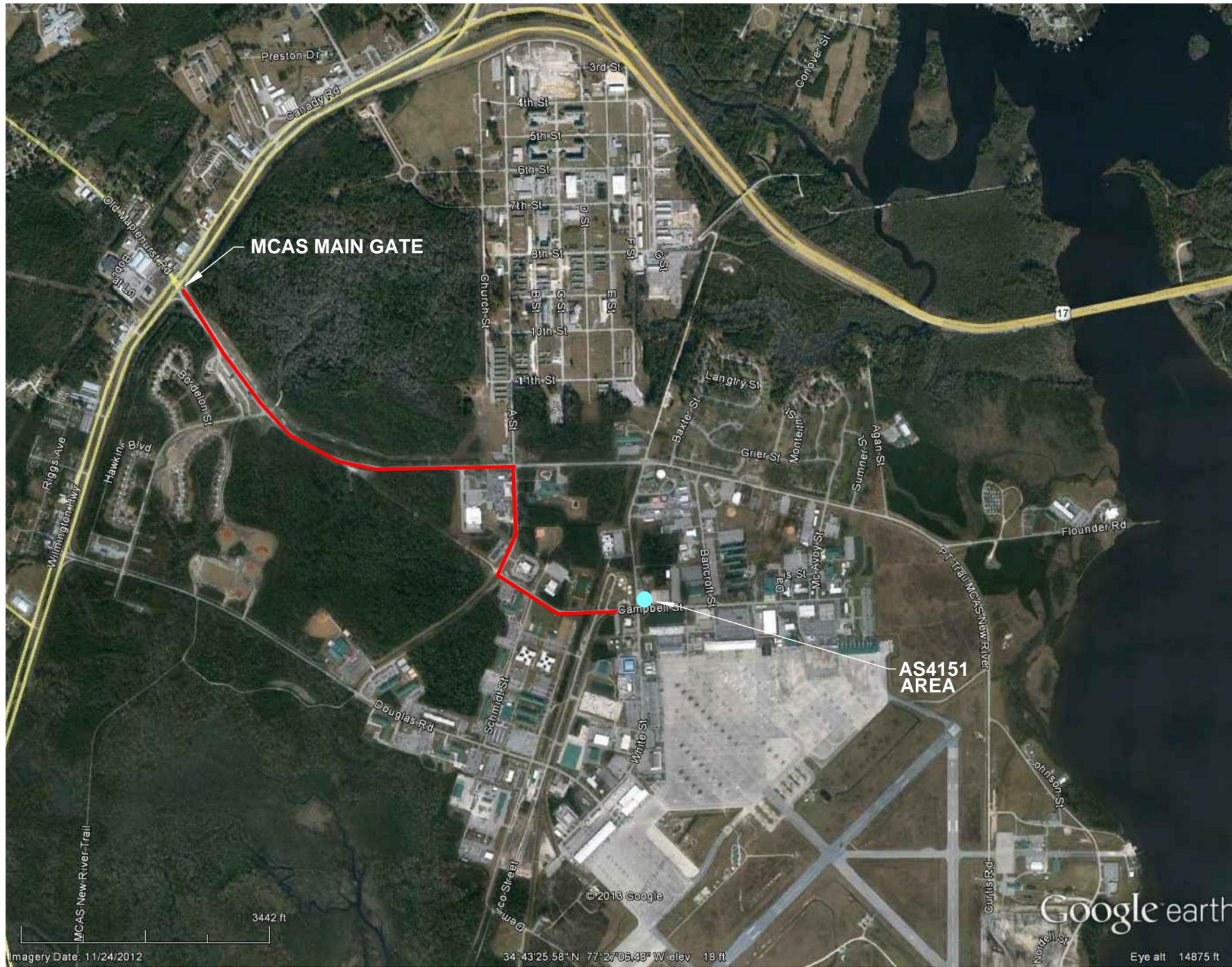
**MARINE CORPS INSTALLATIONS EAST - MARINE CORP BASE CAMP LEJEUNE  
 AST REMOVALS  
 SITE G650, CAMP GEIGER  
 TRAFFIC PLAN**

PREP	CHK	APPR	DATE

**FIGURE  
7**



CAD FILE: WE21-FIGURE 8-AS4151.DWG



LEGEND:

 TRAFFIC ROUTE

SOURCE: GOOGLE EARTH PRO

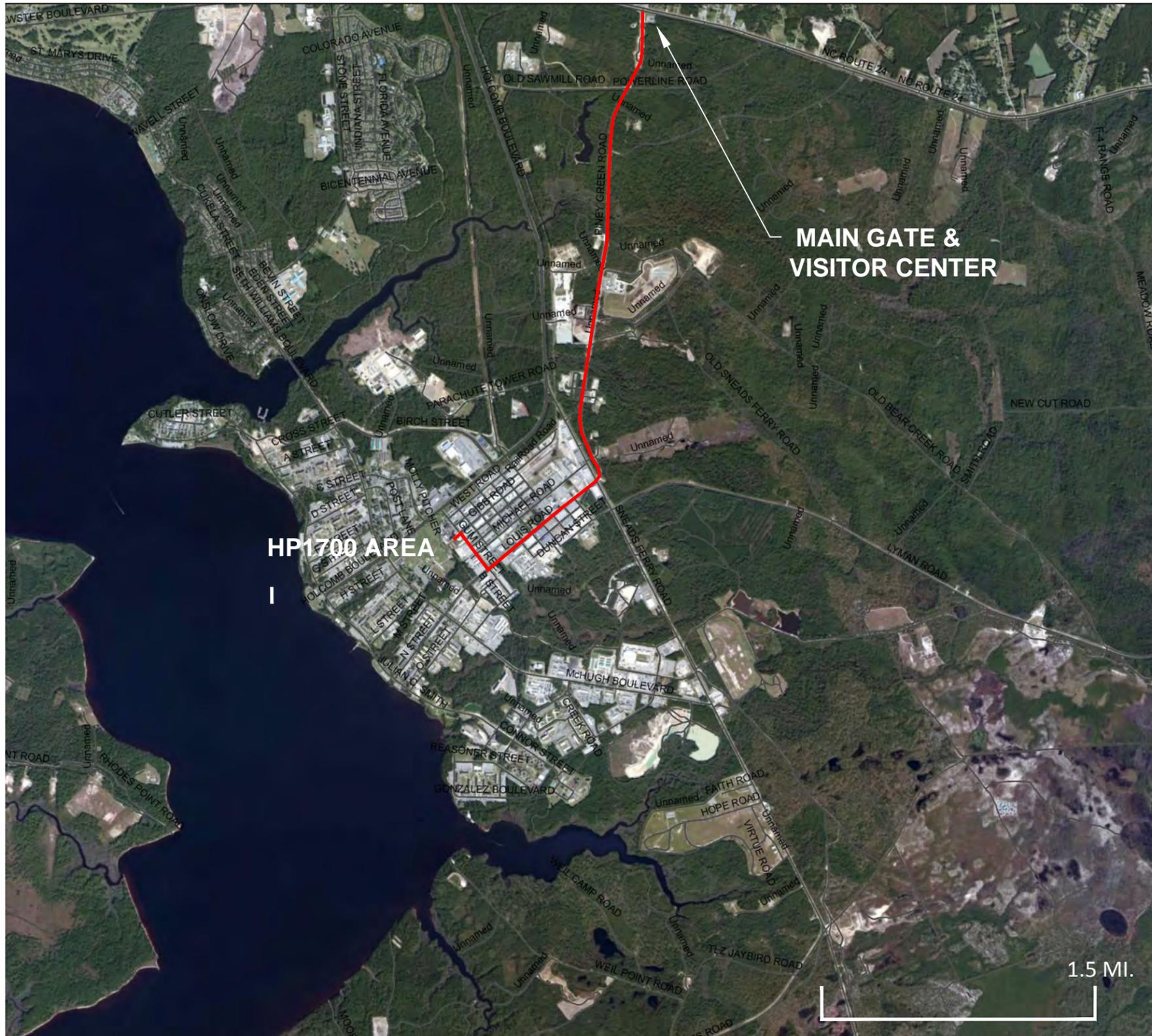
MARINE CORPS INSTALLATIONS EAST - MARINE CORP BASE CAMP LEJEUNE  
**AST REMOVALS**  
 SITE AS4151, MCAS NEW RIVER  
 TRAFFIC PLAN

PREP	CHK	APPR	DATE

**FIGURE 8**



TETRA TECH EC, INC.



LEGEND:  
 TRAFFIC ROUTE

SOURCE: ESRI MAPS

CAD FILE: WE21-FIGURE 9-HP1700.DWG

MARINE CORPS INSTALLATIONS EAST - MARINE CORP BASE CAMP LEJEUNE  
**AST REMOVALS**  
 SITE HP1700, MAIN SIDE  
 TRAFFIC PLAN

PREP	CHK	APPR	DATE

FIGURE  
 9



TETRA TECH EC, INC.

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**APPENDIX A**  
**PHOTOGRAPHS**

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Location	Building	Tank ID	Volume (gal)	Content	Product Remaining
Stone Bay	RR15	RR15-03A	1000	Ultra Low Sulfur Diesel Fuel	No



1) Include removal of concrete pad and bollards

Location	Building	Tank ID	Volume (gal)	Content	Product Remaining
Camp Geiger	G650	SG650-01A	60000	Ultra Low Sulfur Diesel Fuel	No
		SG650-02A	60000	Ultra Low Sulfur Diesel Fuel	No



- 1) Keep secondary containment structure
- 2) Remove associated piping up to where it meets building G650
- 3) Sidewalk does not need replacing
- 4) AB is around 79 linear feet
- 5) CD is around 14 linear feet

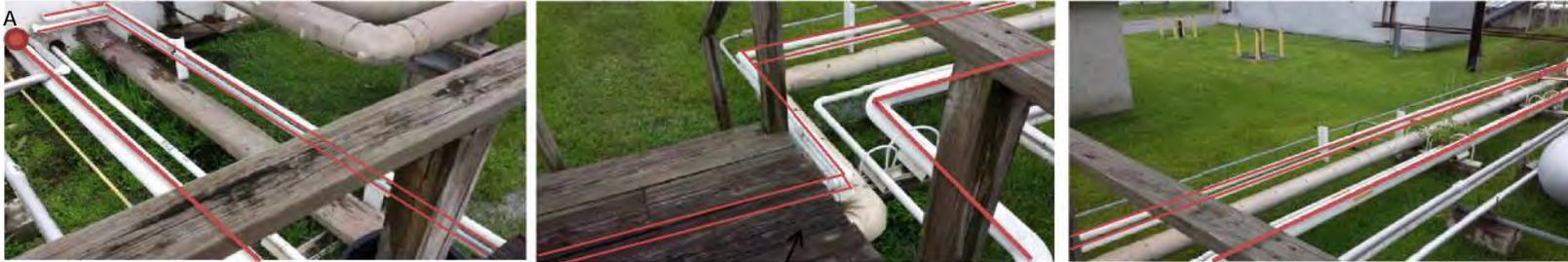


- 1) Possible to remove pipe without tearing up road?
- 2) Remove structure

Location	Building	Tank ID	Volume (gal)	Content	Product Remaining
MCAS New River	AS4151	AS4152A	100000	Ultra Low Sulfur Diesel Fuel	No
		AS4153A	100000	Ultra Low Sulfur Diesel Fuel	No
		AS4154A	100000	Ultra Low Sulfur Diesel Fuel	No



- 1) Keep secondary containment structures
- 2) Remove associated pipings up to where it meets building AS4151
- 3) AB is about 233 linear feet



Wooden overpass walking bridge

- 4) Remove electrical boxes and railing



Keep secondary containment pad

4) Remove electrical boxes and railing



Location	Building	Tank ID	Volume (gal)	Content	Product Remaining
Main	HP1700	1700	1000	Tri-ACT® 1820 (Corrosion Inhibitor)	Small Amount



1) Include removal of secondary containment structure

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**APPENDIX B**  
**SDS, TRI-ACT 1820**

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## SAFETY DATA SHEET

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : **Tri-ACT® 1820**

APPLICATION : CORROSION INHIBITOR

COMPANY IDENTIFICATION :  
Nalco Company  
1601 W. Diehl Road  
Naperville, Illinois  
60563-1198

EMERGENCY TELEPHONE NUMBER(S) : (800) 424-9300 (24 Hours) CHEMTREC

NFPA 704M/HMIS RATING

HEALTH : 3/3 FLAMMABILITY : 2/2 INSTABILITY : 0/0 OTHER :  
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme \* = Chronic Health Hazard

### 2. COMPOSITION/INFORMATION ON INGREDIENTS

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

Hazardous Substance(s)	CAS NO	% (w/w)
Cyclohexylamine	108-91-8	10.0 - 30.0
Diethylethanolamine	100-37-8	5.0 - 10.0
Morpholine	110-91-8	5.0 - 10.0

### 3. HAZARDS IDENTIFICATION

#### \*\*EMERGENCY OVERVIEW\*\*

#### DANGER

Corrosive. May cause tissue damage. Combustible. Harmful in contact with skin and if swallowed Vapors may have a strong offensive odor which may cause sensory response including headache, nausea and vomiting. Irritating to respiratory system.

Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. Keep away from heat. Keep away from sources of ignition - No smoking. Keep container tightly closed. Avoid breathing vapor. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water. Use a mild soap if available. Protect product from freezing.

Wear a face shield. Wear chemical resistant apron, chemical splash goggles, impervious gloves and boots.

Combustible Liquid; may form combustible mixtures at or above the flash point. May evolve oxides of carbon (CO<sub>x</sub>) under fire conditions. May evolve oxides of nitrogen (NO<sub>x</sub>) under fire conditions. Empty product containers may contain product residue. Do not pressurize, cut, heat, weld, or expose containers to flame or other sources of ignition.

PRIMARY ROUTES OF EXPOSURE :  
Eye, Skin, Inhalation



## SAFETY DATA SHEET

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

**(800) 424-9300 (24 Hours) CHEMTREC**

### HUMAN HEALTH HAZARDS - ACUTE :

#### EYE CONTACT :

Corrosive. Will cause eye burns and permanent tissue damage. Exposure to low vapor concentrations can result in foggy or blurred vision, objects appearing bluish and appearance of a halo around lights. These symptoms are temporary.

#### SKIN CONTACT :

Corrosive; causes permanent skin damage. Harmful if absorbed through skin.

#### INGESTION :

Not a likely route of exposure. Corrosive; causes chemical burns to the mouth, throat and stomach. Harmful if swallowed.

#### INHALATION :

Irritating, in high concentrations, to the eyes, nose, throat and lungs. Vapors may have a strong offensive odor which may cause sensory response including headache, nausea and vomiting.

#### AGGRAVATION OF EXISTING CONDITIONS :

A review of available data does not identify any worsening of existing conditions.

### HUMAN HEALTH HAZARDS - CHRONIC :

Prolonged exposure to cyclohexylamine in the diet has produced reproductive effects in rats. The relevance to humans is unknown.

## 4. FIRST AID MEASURES

#### EYE CONTACT :

Immediately flush eye with water for at least 15 minutes while holding eyelids open. **PROMPT ACTION IS ESSENTIAL IN CASE OF CONTACT.** Get immediate medical attention.

#### SKIN CONTACT :

Immediately flush with plenty of water for at least 15 minutes. Use a mild soap if available. For a large splash, flood body under a shower. Get immediate medical attention. Contaminated clothing, shoes, and leather goods must be discarded or cleaned before re-use.

#### INGESTION :

Get immediate medical attention. **DO NOT INDUCE VOMITING.** If conscious, washout mouth and give water to drink.

#### INHALATION :

Remove to fresh air, treat symptomatically. Get immediate medical attention.

#### NOTE TO PHYSICIAN :

Probable mucosal damage may contraindicate the use of gastric lavage. Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition.



## SAFETY DATA SHEET

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

### 5. FIRE FIGHTING MEASURES

FLASH POINT : 131 °F / 55 °C ( PMCC )

EXTINGUISHING MEDIA :

Dry powder, Carbon dioxide, Foam, Other extinguishing agent suitable for Class B fires, For large fires, use water spray or fog, thoroughly drenching the burning material.

Keep containers cool by spraying with water.

FIRE AND EXPLOSION HAZARD :

Combustible Liquid; may form combustible mixtures at or above the flash point. May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) under fire conditions. Empty product containers may contain product residue. Do not pressurize, cut, heat, weld, or expose containers to flame or other sources of ignition.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :

In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

### 6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS :

Restrict access to area as appropriate until clean-up operations are complete. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Stop or reduce any leaks if it is safe to do so. Keep people away from and upwind of spill/leak. Ventilate spill area if possible. Remove sources of ignition. Ensure clean-up is conducted by trained personnel only. Do not touch spilled material. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Notify appropriate government, occupational health and safety and environmental authorities.

METHODS FOR CLEANING UP :

SMALL SPILLS: Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. LARGE SPILLS: Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Wash site of spillage thoroughly with water. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS :

Prevent material from entering sewers or waterways.

### 7. HANDLING AND STORAGE

HANDLING :

Do not get in eyes, on skin, on clothing. Do not take internally. Do not breathe vapors/gases/dust. Use with adequate ventilation. Avoid generating aerosols and mists. Keep away from acids and oxidizing agents. Do not use, store, spill or pour near heat, sparks or open flame. Keep the containers closed when not in use. Have emergency equipment (for fires, spills, leaks, etc.) readily available.

STORAGE CONDITIONS :

Store in suitable labeled containers. Store the containers tightly closed. Store away from heat and sources of ignition. Have appropriate fire extinguishers available in and near the storage area. Connections must be grounded to avoid



## SAFETY DATA SHEET

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

electrical charges. Store separately from oxidizers. Store separately from acids. Amine and sulphite products should not be stored within close proximity or resulting vapors may form visible airborne particles.

### SUITABLE CONSTRUCTION MATERIAL :

Compatibility with Plastic Materials can vary; we therefore recommend that compatibility is tested prior to use.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### OCCUPATIONAL EXPOSURE LIMITS :

Exposure guidelines have not been established for this product. Available exposure limits for the substance(s) are shown below.

Substance(s)	Category:	ppm	mg/m3	Non-Standard Unit
Cyclohexylamine	ACGIH/TWA	10		
Diethylethanolamine	ACGIH/TWA	2		
	ACGIH/Skin*			
	OSHA Z1/PEL	10	50	
	OSHA Z1/Skin*			
Morpholine	ACGIH/TWA	20		
	ACGIH/Skin*			
	OSHA Z1/PEL	20	70	
	OSHA Z1/Skin*			

\* Can be absorbed through the skin.

### ENGINEERING MEASURES :

General ventilation is recommended. Use local exhaust ventilation if necessary to control airborne mist and vapor.

### RESPIRATORY PROTECTION :

Where concentrations in air may exceed the limits given in this section or when significant mists, vapors, aerosols, or dusts are generated, an approved air purifying respirator equipped with suitable filter cartridges is recommended. Consult the respirator / cartridge manufacturer data to verify the suitability of specific devices. In event of emergency or planned entry into unknown concentrations a positive pressure, full-facepiece SCBA should be used. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection.

### HAND PROTECTION :

When handling this product, the use of chemical gauntlets is recommended. The choice of work glove depends on work conditions and what chemicals are handled. Please contact the PPE manufacturer for advice on what type of glove material may be suitable. Gloves should be replaced immediately if signs of degradation are observed.

### SKIN PROTECTION :

Wear chemical resistant apron, chemical splash goggles, impervious gloves and boots. A full slicker suit is recommended if gross exposure is possible.



## SAFETY DATA SHEET

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

### EYE PROTECTION :

Wear a face shield with chemical splash goggles.

### HYGIENE RECOMMENDATIONS :

Use good work and personal hygiene practices to avoid exposure. Eye wash station and safety shower are necessary. If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse. Always wash thoroughly after handling chemicals. When handling this product never eat, drink or smoke.

### HUMAN EXPOSURE CHARACTERIZATION :

Based on our recommended product application and personal protective equipment, the potential human exposure is: Low

## 9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	Liquid
APPEARANCE	Light yellow
ODOR	Amine
SPECIFIC GRAVITY	0.98 - 0.99 @ 77 °F / 25 °C
DENSITY	8.1 - 8.2 lb/gal
SOLUBILITY IN WATER	Complete
pH (100 %)	12.0 - 13.0
VISCOSITY	5 cps @ 77 °F / 25 °C
FREEZING POINT	27 °F / -3 °C
VAPOR PRESSURE	6 mm Hg @ 68 °F / 20 °C

Note: These physical properties are typical values for this product and are subject to change.

## 10. STABILITY AND REACTIVITY

### STABILITY :

Stable under normal conditions.

### HAZARDOUS POLYMERIZATION :

Hazardous polymerization will not occur.

### CONDITIONS TO AVOID :

Heat and sources of ignition including static discharges.

### MATERIALS TO AVOID :

Contact with strong acids (e.g. sulfuric, phosphoric, nitric, hydrochloric, chromic, sulfonic) may generate heat, splattering or boiling and toxic vapors. Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid, perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors. Avoid contact with SO<sub>2</sub> or acidic bisulfite products, which may react to form visible airborne amine salt particles. Certain



## SAFETY DATA SHEET

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

amines in contact with nitrous acid, organic or inorganic nitrites or atmospheres with high nitrous oxide concentrations may produce N-nitrosamines, many of which are cancer-causing agents to laboratory animals.

### HAZARDOUS DECOMPOSITION PRODUCTS :

Under fire conditions: Oxides of carbon, Oxides of nitrogen

## 11. TOXICOLOGICAL INFORMATION

The following results are for a similar product.

### ACUTE ORAL TOXICITY :

Species: Rat  
LD50: 779 mg/kg  
Test Descriptor: Similar Product

### ACUTE DERMAL TOXICITY :

Species: Rabbit  
LD50: 2,055 mg/kg  
Test Descriptor: Similar Product

### ACUTE INHALATION TOXICITY :

Species: Rat  
LC50: > 12000 PPM (8 hrs)  
Test Descriptor: Similar Product

### SENSITIZATION :

This product is not expected to be a sensitizer.

### CARCINOGENICITY :

None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

### REPRODUCTIVE EFFECTS :

Prolonged exposure to cyclohexylamine in the diet has produced reproductive effects in rats. The relevance to humans is unknown.

### HUMAN HAZARD CHARACTERIZATION :

Based on our hazard characterization, the potential human hazard is: High

## 12. ECOLOGICAL INFORMATION

### ECOTOXICOLOGICAL EFFECTS :

The following results are for the product.

**SAFETY DATA SHEET**

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

## ACUTE FISH RESULTS :

Species	Exposure	LC50	Test Descriptor
Inland Silverside	96 hrs	500.0 mg/l	Product
Fish		650 mg/l	Product
Sheepshead Minnow	96 hrs	454 mg/l	Product
Fathead Minnow	96 hrs	75 mg/l	Product
Rainbow Trout	96 hrs	130 mg/l	Product

## ACUTE INVERTEBRATE RESULTS :

Species	Exposure	LC50	EC50	Test Descriptor
Mysid Shrimp (Mysidopsis bahia)	96 hrs	131 mg/l		Product
Daphnia magna	48 hrs	190 mg/l		Product

## AQUATIC PLANT RESULTS :

Species	Exposure	EC50/LC50	Test Descriptor
Algae		5,000 mg/l	Product

## AQUATIC MICROORGANISM RESULTS :

Species	Exposure	EC50/LC50	Test Descriptor
Pseudomonas putida		7,500 mg/l	Product

## PERSISTENCY AND DEGRADATION :

Chemical Oxygen Demand (COD) : 563,000 mg/l

The organic portion of this preparation is expected to be readily biodegradable.

## MOBILITY :

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.

If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air	Water	Soil/Sediment
<5%	30 - 50%	50 - 70%

The portion in water is expected to be soluble or dispersible.

## BIOACCUMULATION POTENTIAL

This preparation or material is not expected to bioaccumulate.



## SAFETY DATA SHEET

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

### ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION

Based on our hazard characterization, the potential environmental hazard is: Moderate

Based on our recommended product application and the product's characteristics, the potential environmental exposure is: High

If released into the environment, see CERCLA/SUPERFUND in Section 15.

## 13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it could meet the criteria of a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Before disposal, it should be determined if the waste meets the criteria of a hazardous waste.

Hazardous Waste: D001, D002

Hazardous wastes must be transported by a licensed hazardous waste transporter and disposed of or treated in a properly licensed hazardous waste treatment, storage, disposal or recycling facility. Consult local, state, and federal regulations for specific requirements.

## 14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are as follows.

### LAND TRANSPORT :

Proper Shipping Name :	CORROSIVE LIQUID, FLAMMABLE, N.O.S.
Technical Name(s) :	CYCLOHEXYLAMINE, DIETHYLAMINOETHANOL, MORPHOLINE
UN/ID No :	UN 2920
Hazard Class - Primary :	8
Hazard Class - Secondary :	3
Packing Group :	II
Flash Point :	55 °C / 131 °F

### AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name :	CORROSIVE LIQUID, FLAMMABLE, N.O.S.
Technical Name(s) :	CYCLOHEXYLAMINE, DIETHYLAMINOETHANOL, MORPHOLINE
UN/ID No :	UN 2920
Hazard Class - Primary :	8
Hazard Class - Secondary :	3
Packing Group :	II

### MARINE TRANSPORT (IMDG/IMO) :



# SAFETY DATA SHEET

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

Proper Shipping Name :	CORROSIVE LIQUID, FLAMMABLE, N.O.S.
Technical Name(s) :	CYCLOHEXYLAMINE, MORPHOLINE
UN/ID No :	UN 2920
Hazard Class - Primary :	8
Hazard Class - Secondary :	3
Packing Group :	II

## 15. REGULATORY INFORMATION

This section contains additional information that may have relevance to regulatory compliance. The information in this section is for reference only. It is not exhaustive, and should not be relied upon to take the place of an individualized compliance or hazard assessment. Nalco accepts no liability for the use of this information.

NATIONAL REGULATIONS, USA :

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :

Based on our hazard evaluation, the following substance(s) in this product is/are hazardous and the reason(s) is/are shown below.

Cyclohexylamine : Corrosive, Flammable, Prolonged exposure to cyclohexylamine in the diet has produced reproductive effects in rats. The relevance to humans is unknown.

Diethylethanolamine : Combustible., Corrosive

Morpholine : Corrosive, Flammable, HARMFUL

CERCLA/SUPERFUND, 40 CFR 302 :

Notification of spills of this product is not required. Notification of spills of this product is not required.

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :

This product contains the following substance(s) which is listed in Appendix A and B as an Extremely Hazardous Substance. Listed below are the statutory Threshold Planning Quantity (TPQ) for the substance(s) and the Reportable Quantity (RQ) of the product. If a reportable quantity of product is released, it requires notification to your State Emergency Response Commission. You may also be required to notify the National Response Center - See CERCLA/SUPERFUND, above.

<u>Extremely Hazardous Substance</u>	<u>TPQ</u>	<u>RQ</u>
Cyclohexylamine	10,000 lbs	40,000 lbs

SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :

Our hazard evaluation has found this product to be hazardous. The product should be reported under the following indicated EPA hazard categories:

X	Immediate (Acute) Health Hazard
X	Delayed (Chronic) Health Hazard
X	Fire Hazard
-	Sudden Release of Pressure Hazard
-	Reactive Hazard

**Nalco Company** 1601 W. Diehl Road • Naperville, Illinois 60563-1198 • (630)305-1000

For additional copies of an MSDS visit [www.nalco.com](http://www.nalco.com) and request access.



## SAFETY DATA SHEET

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

**(800) 424-9300 (24 Hours) CHEMTREC**

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

### SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :

This product does not contain substances on the List of Toxic Chemicals.

### TOXIC SUBSTANCES CONTROL ACT (TSCA) :

The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

### FOOD AND DRUG ADMINISTRATION (FDA) Federal Food, Drug and Cosmetic Act :

When use situations necessitate compliance with FDA regulations, this product is acceptable under : 21 CFR 173.310 Boiler Water Additives

The following limitations apply:

#### Maximum dosage

45 PPM

#### Limitation

as product in the steam

This product can not be used where the steam produced will contact milk or milk products.

### NSF NON-FOOD COMPOUNDS REGISTRATION PROGRAM (former USDA List of Proprietary Substances & Non-Food Compounds) :

NSF Registration number for this product is : 062362

This product is acceptable for use in meat, poultry, and other food processing areas as a Boiler Treatment Product (G6), for treating boiler and steam lines where the steam produced may contact edible products. Acceptable usage shall be in accordance with the dosage limitations specified on the product label.

This product has been certified as KOSHER/PAREVE for year-round use INCLUDING THE PASSOVER SEASON by the CHICAGO RABBINICAL COUNCIL.

### FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR 116.4 / formerly Sec. 311 :

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

### CLEAN AIR ACT, Sec. 112 (Hazardous Air Pollutants, as amended by 40 CFR 63), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

### CALIFORNIA PROPOSITION 65 :

Substances listed under California Proposition 65 are not intentionally added or expected to be present in this product.



## SAFETY DATA SHEET

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

**(800) 424-9300 (24 Hours) CHEMTREC**

### MICHIGAN CRITICAL MATERIALS :

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

### STATE RIGHT TO KNOW LAWS :

The following substances are disclosed for compliance with State Right to Know Laws:

Cyclohexylamine	108-91-8
Morpholine	110-91-8
Diethylethanolamine	100-37-8

### INTERNATIONAL CHEMICAL CONTROL LAWS :

#### CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :

The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

#### AUSTRALIA

All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

#### CHINA

All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on the Inventory of Existing Chemical Substances China (IECSC).

#### EUROPE

The substances in this preparation have been reviewed for compliance with the EINECS or ELINCS inventories.

#### JAPAN

All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

#### KOREA

All substances in this product comply with the Toxic Chemical Control Law (TCCL) and are listed on the Existing Chemicals List (ECL)

#### PHILIPPINES

All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

## 16. OTHER INFORMATION

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's general risk. This information should provide assistance for your own risk management practices. We have evaluated our product's risk as follows:



## SAFETY DATA SHEET

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

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\* The human risk is: Low

\* The environmental risk is: Moderate

Any use inconsistent with our recommendations may affect the risk characterization. Our sales representative will assist you to determine if your product application is consistent with our recommendations. Together we can implement an appropriate risk management process.

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

### REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH, (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight™ (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.



**SAFETY DATA SHEET**

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

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Prepared By : Product Safety Department  
Date issued : 03/10/2011  
Version Number : 2.1

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**APPENDIX C**  
**ACCIDENT PREVENTION 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. WE21**

**FINAL  
ACCIDENT PREVENTION PLAN**

**AST REMOVALS  
MARINE CORPS INSTALLATIONS EAST - MARINE CORPS BASE CAMP LEJEUNE  
JACKSONVILLE, NORTH CAROLINA**

**October 2014**

Prepared for



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

Prepared by

Tetra Tech EC, Inc.  
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<u>Revision</u>	<u>Date</u>	<u>Prepared by</u>	<u>Approved by</u>	<u>Pages Affected</u>
0	10/6/14	C. Joblon	R. Margotto	All

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## TABLE OF CONTENTS

<b>1.0</b>	<b>APPROVALS .....</b>	<b>1</b>
<b>2.0</b>	<b>BACKGROUND INFORMATION.....</b>	<b>2</b>
2.1	Phases of Work Requiring Activity Hazard Analyses:.....	2
<b>3.0</b>	<b>STATEMENT OF SAFETY AND HEALTH POLICY .....</b>	<b>3</b>
3.1	Contractor Accident Experience.....	4
<b>4.0</b>	<b>RESPONSIBILITIES AND LINES OF AUTHORITY .....</b>	<b>4</b>
4.1	Statement of Responsibility.....	4
4.2	Identification and Accountability .....	5
4.2.1	Project Management .....	5
4.2.2	Project Manager – Mark Pisarcik .....	6
4.2.3	Corporate SHM – Roger Margotto, Certified Industrial Hygienist (CIH), Certified Safety Professional (CSP), Certified Hazardous Materials Manager (CHMM).....	6
4.2.4	Site Superintendent – Gary Phelps .....	7
4.2.5	Site Safety and Health Officer – Gary Phelps .....	8
4.2.6	Field Crew Personnel – Various (TtEC and subcontractors).....	9
4.2.7	Subcontractors and Suppliers/Vendors.....	9
4.2.8	Competent Persons .....	9
4.2.9	Pre-task Safety and Health Analysis.....	10
4.2.10	Visitors.....	10
4.3	Lines of Authority.....	10
4.3.1	Policies Regarding Noncompliance.....	10
4.3.2	Manager and Supervisor Accountability for Safety .....	11
<b>5.0</b>	<b>SUBCONTRACTORS AND SUPPLIERS/VENDORS.....</b>	<b>11</b>
5.1	Identification of Subcontractors and Suppliers/Vendors.....	11
5.2	Means for Controlling and Coordinating Subcontractors.....	11
5.3	Safety Responsibilities of Subcontractors and Suppliers/Vendors.....	11
<b>6.0</b>	<b>TRAINING .....</b>	<b>12</b>
6.1	New Hire Training.....	12
6.2	On-the-Job Training.....	12
6.3	Periodic Safety and Health Training.....	12
6.4	Hazardous Waste Operations Training and Refresher.....	13
6.5	Hazard Communication Training .....	13
6.6	Site-Specific Training.....	13
6.7	First Aid and Cardiopulmonary Resuscitation .....	14
6.8	Bloodborne Pathogens Training .....	14
6.9	Use of Portable Fire Extinguishers .....	14

6.10	Hearing Protection .....	14
6.11	On-Site Health and Safety Briefings .....	14
6.12	Training Certificates .....	15
6.13	APP/SSHP Acceptance Form .....	15
<b>7.0</b>	<b>SAFETY AND HEALTH INSPECTIONS .....</b>	<b>16</b>
7.1	Specific Assignment of Responsibility for a Minimum Daily Job Site Safety and Health Inspection During Periods of Work Activity .....	16
7.2	Proof of Inspector’s Training/Qualifications .....	16
7.2.1	Documentation Procedures .....	16
7.2.2	Deficiency Tracking System.....	16
<b>8.0</b>	<b>ACCIDENT REPORTING .....</b>	<b>17</b>
8.1	Exposure Data.....	17
8.2	Accident Investigations, Reports, and Logs .....	17
8.3	Immediate Notification of Major Accidents .....	17
<b>9.0</b>	<b>PLANS (PROGRAMS, PROCEDURES) REQUIRED BY EM 385-1-1, THE SAFETY MANUAL (AS APPLICABLE).....</b>	<b>18</b>
9.1	Layout Plans .....	18
9.2	Emergency Response Plans .....	19
9.2.1	Procedures and Tests .....	20
9.2.1.1	Pre Emergency Planning .....	20
9.2.1.2	Personnel and Lines of Authority for Emergency Situations.....	21
9.2.1.3	Emergency Signal, Assembly and Evacuation Procedures .....	21
9.2.1.4	Emergency Equipment .....	23
9.2.2	Spill Plans .....	24
9.2.3	Firefighting Plan .....	24
9.2.4	Posting of Emergency Telephone Numbers .....	25
9.2.5	Man Overboard/Abandon Ship.....	25
9.2.6	Medical Support.....	25
9.2.6.1	First Aid.....	25
9.2.6.2	Medical Emergency.....	27
9.2.6.3	Fatal Injury .....	27
9.2.6.4	Medical Data Sheet .....	28
9.3	Plan for Prevention of Alcohol and Drug Abuse.....	28
9.4	Site Sanitation Plan.....	28
9.5	Access and Haul Road Plan.....	29
9.6	Respiratory Protection Plan and PPE .....	29
9.6.1	Respiratory Protection Plan .....	29
9.6.2	Personal Protective Equipment.....	32
9.7	Health Hazard Control Program .....	33
9.8	Hazard Communication Program .....	33
9.9	Process Safety Management Plan.....	34
9.10	Lead Abatement Plan.....	34

9.11	Asbestos Abatement Plan .....	34
9.12	Radiation Safety Program.....	34
9.13	Abrasive Blasting.....	34
9.14	Heat/Cold Stress Monitoring Plan.....	34
9.15	Crystalline Silica Monitoring Plan (Assessment).....	38
9.16	Night Operations Lighting Plan.....	38
9.17	Fire Prevention Plan .....	38
9.18	Wild Land Fire Management Plan.....	39
9.19	Hazardous Energy Control Plan .....	40
9.20	Lift Plan .....	40
9.20.1	Crane Operations .....	40
9.20.2	Hoisting and Rigging.....	40
9.20.2.1	General Requirements .....	40
9.20.2.2	Hoisting and Rigging by Mechanical Equipment .....	41
9.21	Contingency Plan for Severe Weather.....	42
9.21.1	Hurricane Preparedness Plan .....	43
9.22	Float Plan.....	44
9.23	Site-Specific Fall Protection and Prevention Plan.....	45
9.24	Demolition Plan (Engineering and Asbestos Surveys).....	45
9.25	Excavation/Trenching Plan.....	45
9.26	Emergency Rescue (Tunneling) .....	46
9.27	Underground Construction Fire Prevention and Protection Plan .....	46
9.28	Compressed Air Plan .....	46
9.29	Formwork and Shoring Erection and Removal Plans.....	46
9.30	Precast Concrete Plan .....	46
9.31	Lift Slab Plans.....	46
9.32	Steel Erection Plan.....	46
9.33	Site Safety and Health Plan for HTRW Work.....	46
9.34	Blasting Safety Plan.....	46
9.35	Diving Plan .....	47
9.36	Confined Spaces .....	47
<b>10.0</b>	<b>RISK MANAGEMENT PROCESSES.....</b>	<b>48</b>
<b>11.0</b>	<b>REFERENCES.....</b>	<b>48</b>

### LIST OF TABLES

Table 2.1	Activity Hazard Analyses (AHAs) .....	3
Table 3.1	Comparison of TtEC and BLS Data for NAICS 237990 (TRIR and DART Rates).....	4
Table 9.1	Emergency Equipment and Locations .....	23
Table 9.2	Emergency Contact List.....	26
Table 9-3	Real-Time Air and Personal Exposure Monitoring Action Levels .....	31

Table 9.4 Progressive Clinical Symptoms of Hypothermia..... 37

### **LIST OF FIGURES**

Figure 1-1	Site Location Map
Figure 4-1	Organizational Chart
Figure 9-1	Site RR15, Stone Bay – Emergency Evacuation Route
Figure 9-2	Site G650, Camp Geiger – Emergency Evacuation Route
Figure 9-3	Site AS4151, MCAS New River – Emergency Evacuation Route
Figure 9-4	Site HP1700, Main Side – Emergency Evacuation Route
Figure 9-5	Site RR15, Stone Bay – Hospital Route Map
Figure 9-6	Site G650, Camp Geiger – Hospital Route Map
Figure 9-7	Site AS4151, MCAS New River– Hospital Route Map
Figure 9-8	Site HP1700, Main Side – Hospital Route Map

### **LIST OF ATTACHMENTS**

Attachment 1	Site Safety and Health Plan
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### **LIST OF APPENDICES**

Appendix A	Activity Hazard Analyses
Appendix B	Corporate Safety and Health Policy Statement
Appendix C	EHS Programs and Procedures
Appendix D	Contractor Significant Incident Report
Appendix E	Medical Data Sheet
Appendix F	Material Safety Data Sheets/Safety Data Sheets

## ACRONYMS AND ABBREVIATIONS

AED	automatic external defibrillator
AHA	Activity Hazard Analysis
APP	Accident Prevention Plan
APR	air purifying respirator
AST	Above Ground Storage Tank
BLS	Bureau of Labor Statistics
CAMLEJ	Camp Lejeune
CFR	Code of Federal Regulations
CHMM	Certified Hazardous Materials Manager
CIH	Certified Industrial Hygienist
CIRS	Contractor Incident Reporting System
°C	Celsius
CO	carbon monoxide
CPR	cardiopulmonary resuscitation
CSE	Confined Space Entry
CSIR	Contractor Significant Incident Report
CSP	Certified Safety Professional
DART	<u>Days Away/Restricted Duty/Transfer Rate</u>
EC	Emergency Coordinator
EHS	Environmental Health and Safety
EM	Engineer Manual
EPP	Environmental Protection Plan
ET	Engineering Technician
°F	degrees Fahrenheit
FCR	Field Change Request
HAZCOM	hazard communication
GHS	Global Harmonization System
HAZWOPER	Hazardous Waste Operations and Emergency Response
H <sub>2</sub> S	hydrogen sulfide
HTRW	hazardous, toxic, or radioactive waste
Kg	kilogram
LEL	lower explosive limit
MCAS	Marine Corps Air Station
MCB	Marine Corps Base
MCIEAST	Marine Corps Installations East-
MSDS	Material Safety Data Sheet
MIDLANT	Mid Atlantic
mph	miles per hour
NAICS	North American Industry Classification System
NAVFAC	Naval Facilities Engineering Command
Navy	Department of the Navy

NCDENR	North Carolina Department of Environment and Natural Resources
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
OICC	Officer in Charge of Construction
OSHA	Occupational Safety and Health Administration
NCOSHA	North Carolina Occupational Safety and Health Administration
NTR	Navy Technical Representative
PEL	permissible exposure limit
PM	Project Manager (Tetra Tech)
ppm	parts per million
PPE	personal protective equipment
RAM	real-time aerosol monitor
RPM	Remedial Project Manager
SDS	Safety Data Sheet
SHM	Safety and Health Manager
SPCC	Federal Spill Prevention and Contingency Control
SS	Site Superintendent
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SZ	support zone
TtEC	Tetra Tech EC, Inc.
TRIR	Total Recordable Incident Rate
ULSD	Ultra Low Sulfur Diesel
USACE	U.S. Army Corps of Engineers
WBGT	wet bulb globe thermometer
ZIP	Zero Incident Performance

## 1.0 APPROVALS

By their signatures, the undersigned hereby certify that this Accident Prevention Plan (APP) has been prepared in accordance with the requirements of Engineering Manual (EM) 385 1-1 (current version including revisions) and has been reviewed and approved for use during field operations to perform Above Ground Storage Tank (AST) Removals at Marine Corps Base Camp Lejeune in Jacksonville, North Carolina.



Prepared by:

---

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Approved by:

---

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Concurrence:

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---

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## 2.0 BACKGROUND INFORMATION

- a. **Contractor:** Tetra Tech EC, Inc. (TtEC)
- b. **Contract Number:** N62470-13-D-8007, Task Order WE03.
- c. **Project Name:** AST Removals, Marine Corps Base Camp Lejeune in Jacksonville, North Carolina.
- d. **Project Description:**

The various AST sites are located at Marine Corps Installations East (MCIEAST) Marine Corps Base (MCB) Camp Lejeune (CAMLEJ) and Marine Corps Air Station (MCAS) New River complex. The Base is a 156,000-acre facility located in Onslow County, North Carolina, adjacent to the southern side of the City of Jacksonville (Figure 1-1). The mission of the camp is to maintain combat ready units for expeditionary deployment. The Base provides housing, training facilities, and logistical support for Fleet Marine Force Units and other assigned units. TtEC has been contracted by the Department of the Navy (Navy) to remove 7 ASTs.

Numerous fuel/product storage tanks are in operation aboard the MCB and MCAS complex. The tanks are subject to various State and Federal environmental regulatory requirements and may also require certain specific permits. Recently a steam plant operated by MCB (Building AS-4151), including four ASTs, was taken out of service. There is no plan to reuse the ASTs associated with the steam plant. Various other ASTs at the installation have reached their service life and are no longer needed. These tanks, as well as their associated piping systems, shall be removed per all applicable federal and state regulatory requirements. These actions will be performed in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), the North Carolina Department of Environment and Natural Resources (NCDENR) non-underground storage tank regulations, the MCIEAST-MCBCAMLEJ Tank Management Plan, and the Federal Spill Prevention, Control, and Countermeasure (SPCC) requirements found in the Code of Federal Regulations (CFR), title 40, section 112.

### 2.1 Phases of Work Requiring Activity Hazard Analyses:

The work elements above will consist of the following primary work tasks, each of which is addressed in an Activity Hazard Analysis (AHA) included as Appendix A to this APP. AHAs will be updated or developed accordingly when a process changes, new information is obtained, or when new tasks will be performed.

**Table 2.1 Activity Hazard Analyses (AHAs)**

AHA – 1	Mobilization and Site Setup
AHA – 2	Utility Mark-out and Erosion and Sediment Control Installation
AHA – 3	ASTs and Piping Removal
AHA – 4	Confined Space Entry
AHA – 5	Waste Management
AHA – 6	Site Restoration
AHA – 7	Demobilization
AHA – 8	Hoisting and Rigging

The above activities present hazards to workers. Mitigations for the hazards associated with the work are presented in this APP and its Site Safety and Health Plan (SSHP), which is included as Attachment 1 to this APP. All personnel involved in the tasks listed above are required to review and be familiar with the requirements of the APP and specifically, to review and sign the AHA for the task elements they will be involved with during the fieldwork.

### **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) 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 B to this APP.

### 3.1 Contractor Accident Experience

Table 3.1 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.

**Table 3.1 Comparison of TtEC and BLS Data for NAICS 237990 (TRIR and DART Rates)**

	<b>NAICS 237990 Heavy Construction Other than Highways 2011</b>	<b>TtEC 2010</b>	<b>TtEC 2011</b>	<b>TtEC 2012</b>
	<b>NAICS 237990 Heavy Construction</b>	<b>TtEC</b>	<b>TtEC</b>	<b>TtEC</b>
<b>Total Recordable Incident Rate (TRIR)</b>	2.5	0.92	0.30	0.59
<b>Days Away/Restricted Duty/Transfer Rate (DART)</b>	1.2	0.35	0.15	0.59

This data comparison illustrates that TtEC’s performance is very good and that our rates are significantly lower than the most recent national averages for the heavy construction industry.

TtEC’s Experience Modification Rates are as follows:

(Policy Year October 1–September 30):

2011–2012: 0.78  
 2012–2013: 0.76  
 2013-2014: 0.80

## 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. 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 personnel and subcontractors, who are conducting field activities throughout the duration of this project.

### **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.
- 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.
- 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 – Mark Pisarcik

With respect to the EHS program, it is the responsibility of the Project Manager (PM) to:

- Ensure implementation of this APP through coordination with the Site Superintendent (SS) and Safety and Health Manager (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 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, Certified Industrial Hygienist (CIH), Certified Safety Professional (CSP), Certified Hazardous Materials Manager (CHMM)

The SHM will review and approve this APP and any amendments prior to their adoption. The SHM 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 Site Safety and Health Officer (SSHO) and SS 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
- Approve upgrading or downgrading of personal protective equipment (PPE)
- Assist in the investigation of incidents

#### 4.2.4 Site Superintendent – Gary Phelps

It is the SS responsibility to:

- Ensure site personnel comply with the APP
- Coordinate with the SSHO 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 the local authorities 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.
- Monitor team member's performance, including safety and quality control.
- Be responsible for overall direction of on-site intrusive activities.
- Be responsible for the day-to-day work at the site.
- Be responsible for implementing and enforcing all work plans.
- Conduct daily activities such as:
  - 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 jointly with the SSHO.
- Conduct incident investigations.
- Initiate corrective actions for observed safety violations.
- Conduct daily safety meetings.
- Ensure completion of the project on schedule and within budget, in accordance with the permits and project plans.
- Ensure that appropriate change management procedures are in place.
- Ensure compliance with all environmental, health, and safety requirements, including corporate policies, programs, and procedures; Occupational Safety and Health Administration (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 material control requirements in accordance with Government Property Control Procedures.
- 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 Emergency Coordinator (EC) for all emergencies

- Prepare and submit (electronically) the Daily Contractor Production Report to the Navy Remedial Project Manager (RPM), Officer-In-Charge of Construction (OICC), and PM.

#### 4.2.5 Site Safety and Health Officer – Gary Phelps

The SSHO will fulfill the duties and responsibilities as defined in corporate procedures. The SSHO will have completed the 30-hour OSHA construction safety class or equivalent. The SSHO has over 5 years of construction experience 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 TtEC EHS programs and procedures (presented in Appendix C). The SSHO helps to ensure that operations are performed in compliance with applicable client- and site-specific requirements and government regulations. The SSHO will be responsible for the following:

- Ensure that TtEC employees and subcontractors understand the requirements of the TtEC EHS program and procedures through training and communications.
- Assist the SS with implementation of the APP.
- Conduct daily EHS briefings in accordance with corporate procedures.
- Conduct daily informal inspections of the project site and recording observations in the logbook.
- Ensure that TtEC employees and subcontractors understand the requirements of the TtEC EHS program and procedures through training and communications.
- Assist with implementation of the APP.
- Conduct daily EHS briefings in accordance with corporate procedures.
- Conduct daily informal inspections of the project site and recording observations in the logbook or in the daily safety report.
- Update the Safety and Health Deficiency Log on a daily basis.
- Assist the SS with weekly health and safety inspections. Ensure corrective actions identified are being addressed and corrected.
- Exercise stop work authority when warranted by conditions, in accordance with the project plans.
- Ensure that TtEC site personnel have received required EHS regulatory and program training, in accordance with corporate procedure training.
- Support the PM and SS in accident and incident investigations.
- Function as a technical resource for all environmental, safety, loss control, and industrial hygiene issues.
- Ensure that the specific responsibilities for EHS personnel identified in the TtEC EHS programs and the EHS plan(s) are fulfilled.
- Perform on-site monitoring to determine appropriate levels and use of personal protective equipment (PPE).
- Perform site surveillances, hazard identification, and health risk analysis.
- Act as EC when the SS is not immediately available.

- Implement procedures and programs to eliminate risk to site personnel, including initiating changes to the plan.
- Implement site control measures.
- Maintain the field health and safety logbook.
- Provide summaries of field operations and progress to the SHM.

#### 4.2.6 Field Crew Personnel – Various (TtEC and subcontractors)

Field crew personnel include TtEC personnel and subcontractor personnel as well as 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 to the SS
- 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 Report 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, who will notify the PM and OICC 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
- Assist the SS with implementation and compliance with the APP

#### 4.2.7 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.

#### 4.2.8 Competent Persons

The SSHO, Gary Phelps, will be the competent person(s) for excavation and hoisting and rigging. A competent person will be identified, in writing by the PM, for other tasks (i.e., confined space entry) that may require a competent person. The SSHO will also perform on-site hazard assessments and safety inspections/audits of the work site, material, and equipment. The SSHO is competent in these matters as evidenced by years of experience in providing health and safety and technical oversight on numerous construction projects and their formal training in

OSHA Construction Safety (30-hour) and Hazardous Waste Site Operations (HAZWOPER) (40-hour), HAZWOPER Site Supervisor (8-hour) as well as training on specific topics regarding hazards at construction sites. The SSHO is overseen by and reports to the SHM. Additional competent persons for tasks such as hoisting and rigging and other tasks where this is required will be included in the AHAs and APP/SSHP sections prepared that address specific tasks and the need to identify a competent person. Subcontractor personnel will provide competent persons as required where their tasks require a competent person.

#### 4.2.9 Pre-task Safety and Health Analysis

This plan requires the preparation of an AHA for each task. 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 will ask the subcontractor to provide an AHA for review or the SSHO will work with the subcontractor in the preparation of the AHA. The AHA must be reviewed by the Contracting Officer and the SHM. As new activities 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 Contracting Officer for review.

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.

#### 4.2.10 Visitors

All visitors to the project site will report to the TtEC SS for a safety briefing and assignment of an escort, as applicable. Visitors, including TtEC employees who are not assigned to the project, will sign in and out on the project visitor's log, maintained at each site, each time they visit the site.

At no time will visitors be allowed onto the project site until they have acknowledged training and understanding of the SSHP, and have received a briefing specific to the hazards of the area they intend to visit and don the required PPE. Visitors, other than as provided for by contract for Navy personnel, are responsible for supplying any PPE required for access to the project site.

### **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 2009), 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 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**

All subcontractors are prequalified following the requirements of EHS 1-4 Subcontractor Selection and Management. Subcontractors working on this project include:

- Site Setup, AST Removal, and Restoration – Cape Environmental

Second tier subcontractors include the following:

- Tank Cleaning Services and Transportation and Disposal of Tank Rinse Water – Cape Environmental
- Transportation and Disposal of Construction Debris, and tanks and pipelines– To be determined
- Imported Fill Material and Delivery – To be determined

### **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. Subcontractors are responsible for assigning specific tasks to their employees; ensuring that their employees are properly trained/ qualified and are in compliance with applicable regulations; and allocating sufficient time, materials, PPE, and equipment to safely complete activities in accordance with this APP/SSHP, and their individual EHS plans. Subcontractors’ EHS plans are reviewed by the SSHO or the SHM.

### **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 subcontractors will be under the direct supervision of the SS.

Subcontractors are responsible for complying with this APP, the SSHP, and other applicable regulations. Subcontractor personnel must receive a briefing from the 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. 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. 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 or its SSHP, 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 SSHO of these hazards and assist in the development and/or revision of AHAs.

## **6.0 TRAINING**

The following training is required on all projects under this contract.

### **6.1 New Hire Training**

No new hires are anticipated for this project. All employees will be trained on the APP and SSHP requirements and specific work tasks they will be performing and supervised with on the job training as shown below.

### **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 remain current with respect to 30-hour Construction Safety training, the SSHO will receive 24 hours of formal health and safety training every 4 years. As mentioned, 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.

#### **6.4 Hazardous Waste Operations Training and Refresher**

There are no specific training requirements pertaining to Hazardous Waste Operations for this task order. However, workers will be briefed on potential hazards and will have experience and knowledge of the equipment and techniques to be used. Supervisors such as the SS and SSHO must have completed 8 hours of relevant supervisory health and safety training and first aid/cardiopulmonary resuscitation (CPR)/bloodborne pathogen 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)/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 on-site SSHO. The SSHO will conduct hazard communication (HAZCOM) training in accordance with 29 CFR 1910.1200 and 29 CFR 1926.59, 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. All personnel must have received the most current HAZCOM training on the Global Harmonization System (GHS). The workers must know the new labeling system, the symbols used to identify the hazards of chemicals, and how to use the new format for SDS.

#### **6.6 Site-Specific Training**

Prior to commencement of field activities, the SSHO will provide site-specific orientation training on each element of this APP and its' SSHP to all personnel assigned to the site. Site-specific training will address the activities, hazards, procedures, monitoring, and equipment for the work operations. Training will include site layout, hazards, evacuation route(s), emergency services at the site, emergency procedures, and the HAZCOM program (see Section 6.3); and will highlight all provisions contained within the APP/SSHP. 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. Specific training using AHAs for each task to be performed will be done at the start of each activity. If additional training is required for completion of field tasks during the site work, then the SHM or SSHO (as appropriate) 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.

In addition, workers who enter or attend to workers who enter any structure or opening that meets the requirements of a confined space (e.g., ASTs) will have received confined space training to fulfill their assigned duties. The subcontractor's training program must be reviewed and accepted by the SHM prior to any confined space entry work. At the present time, confined

space entry is only anticipated for the AST cleaning task (See Section 9.36).

## **6.7 First Aid and Cardiopulmonary Resuscitation**

The SSHO will identify those individuals who have current first aid, automatic external defibrillator (AED), and CPR training. At a minimum, two people (including the SSHO and SS) will have current CPR/first aid certification. The names of all CPR/first aid-qualified workers will be posted on the site near the work area.

A first-aid kit meeting the requirements of OSHA and EM 385-1-1, Section 03.B.01, will be readily available at each work site by having the kit visible and ready for use. 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. The kit will be inspected weekly, and items will be replaced as they are used.

## **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 OSHA Bloodborne Pathogen Standard, 29 CFR 1910.1030. Blood Borne Pathogen training is required annually.

## **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 On-Site Health and Safety Briefings**

Project personnel and visitors will participate in daily on-site health and safety briefings conducted by the SS, SSHO, or delegated subcontractor supervisors to assist site personnel in safely conducting their work activities. Health and safety briefings will be conducted at the start of new work activities using AHAs. The briefings will include information on new operations, changes in work practices, or changes in the site's environmental conditions. The briefings will also provide a forum to facilitate conformance with safety requirements, 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



## **7.0 SAFETY AND HEALTH INSPECTIONS**

Vehicle inspections will be performed daily on all site vehicles and heavy equipment by the operator in accordance with TtEC Construction Procedure (CP)-7. Weekly site inspections will be completed by the SSHO or SS in accordance with TtEC EHS 3-3 procedure. 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 and SSHO and will be noted in the site activity logbook and TtEC Field Inspection Forms referenced above are included in Appendix A in the SSHP. 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. After the performance of the quarterly SHM inspections (if required), the inspection reports are reviewed and action items are followed-up. The SHM or 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 site safety inspections will be conducted by the SSHO during this field effort to ensure safe work areas and compliance with the APP, OSHA regulations, and EM 385-1-1 requirements.

### **7.2 Proof of Inspector's Training/Qualifications**

The SS and SSHO meet the training and experience criteria listed in Section 4.2.10 to serve as the competent person unless otherwise specifically designated otherwise in this APP and AHAs. The SSHO has also completed the 30-hour OSHA Construction Safety Training or equivalent and meets the requirements of EM 385 1-1 Section 01.A.17 in the role of Site Safety and Health Officer.

#### **7.2.1 Documentation Procedures**

The 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 OICC 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 ACCIDENT REPORTING**

When an incident occurs, the SS will orally notify the PM, OICC, and the SSHO immediately. The PM will notify the RPM. The SSHO will notify the SHM. If the incident is an injury requiring more than first aid or government property damages exceeding \$2,000, the PM will immediately notify the Contracting Officer.

### **8.1 Exposure Data**

The SSHO calculates exposure data on a weekly basis. Labor-hours worked are obtained from hours charged to a project for payroll purposes. The SSHO also collects the number of subcontractor labor-hours worked by reviewing daily project production reports and recording the hours on those reports. The SSHO will forward the labor-hours along with the Weekly Safety Report to the SHM, who will compile the monthly total and report that to the Contracting Officer.

### **8.2 Accident Investigations, Reports, and Logs**

After the oral report, the SS or SSHO must complete a written-event report form within 24 hours. This form can be either prepared manually using the form found in the 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 a supervisor and/or the 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. In addition, the PM or the SSHO will complete, within 48 hours, a Contractor Significant Incident Report (CSIR) (Appendix D), as required for any injury beyond first aid or for any government property damages \$2,000 or greater. The SS or the SSHO will ensure that a report is prepared and the forms are completed as requested by the OICC and/or the PM and SHM. In addition, 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.

### **8.3 Immediate Notification of Major Accidents**

Immediate reporting of incidents is required within TtEC. In addition, the Contracting Officer will be immediately notified by the PM (or a designee) of an accident (see list below) that is required to be reported by EM 385-1-1. An accident that must be reported immediately to Mid Atlantic Naval Facilities Engineering Command (NAVFAC MIDLANT) is any injury requiring more than first aid or any government property damage in excess of \$2,000. For each reportable mishap described above, a verbal report will be made to the Navy Technical Representative (NTR) or RPM as soon as possible. The NTR may follow up with a request for submission of the CSIR within 48 hours. The NTR may initiate a report into the Navy Contractor Incident

Reporting System (CIRS) that will generate an e-mail to a TtEC Manager so that data can be made into the CIRS. TtEC will give the NTR the name and e-mail address of the PM or other designated person. The PM will be required to access the CIRS and complete the report with all available information and resubmit the updated report online to NAVFAC MIDLANT within 24 hours of receiving the link.

List of accidents or events to be immediately reported:

- a. Fatal injury/illness;
- b. Permanent totally disabling injury/illness;
- c. Permanent partial disabling injury/illness;
- d. Three or more persons hospitalized as inpatients as a result of a single occurrence; *Note: it is TtEC practice to inform our clients of any accident requiring hospitalization of our employees or subcontractors;*
- e. \$200,000 or greater accidental property damage or damage in an amount specified by United States Army Corps of Engineers (USACE) in current accident reporting regulations (currently we report government property damage \$2,000 or greater);
- f. Arc Flash Incident/Accident that results in a Class A or B injury;
- g. 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.

## **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 Layout Plans**

Layout plans are provided in the work plan. Approval to stage materials and equipment and set up work areas and access to these areas, including but not limited to private and work related contractor vehicle parking and laydown areas will be coordinated through the OICC. Erosion controls and dust control measures will be established in construction areas as per the Work Plan and maintained throughout the project, as required, to minimize erosion and runoff.

An office trailer will not be procured as part of this task order. Temporary facilities will include accessible and regularly serviced portable toilet and hand washing stations. These will be set up for the project in each site location.

Security of the Base is through the Navy, as it is an active Base. Access into the Base to gain entry to where the work will be performed will require badging for personnel and delivery vendors. The work sites and equipment will be secured appropriately to minimize potential unauthorized access and tampering or theft during non-working hours. Restricted work areas

will be conspicuously posted with signage warning of the hazard and whom to contact for permission (including escort) to enter.

Traffic Control will be implemented to control the site during working hours and to comply with Base security requirements and facility operation plans (refer to work plan for more detail). TtEC personnel and any subcontractors will become familiar with and obey Base, requirements including safety, fire, traffic, and security procedures. 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 (if any) unless required to do so and unless cleared for such entry. TtEC will conspicuously mark any equipment and materials in possession for identification.

Construction staging areas will be delineated with high-visibility fencing, barriers, and signage. Equipment and material staging areas will be established for the laydown of equipment (including heavy equipment), materials, supplies, and tools. The equipment and material staging areas will be used for storage in support of construction. Small temporary staging areas will be set up at work areas as necessary.

The Base requires 15 calendar day advance notice in writing any activities that will interrupt any base roads, railroads, and/or utility service. To minimize traffic congestion, delivery of materials shall be outside of peak traffic hours (6:30 to 8:00 a.m. and 3:30 to 5:00 p.m.) unless otherwise approved by the OICC.

## **9.2 Emergency Response Plans**

Emergency situations that may be encountered during site activities will normally be recognized by visual observation. Emergencies involving physical hazards, including fires and explosions are generally readily apparent visually. Injuries and medical emergencies, including exposure to hazardous materials or chemicals 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, SSHP, and associated AHAs. Early recognition of hazards will be supported by daily site surveys to eliminate any situation predisposed to an emergency. The SS, with assistance from the SSHO, will be responsible for performing surveys of work areas prior to initiating site operations and periodically while operations are being conducted. In addition, atmospheric conditions will be monitored through the use of air monitoring equipment when fire hazards exist. Survey findings are documented by the SS and/or the SSHO in the site health and safety logbook. Site personnel are responsible for reporting situations they perceive as hazardous.

The above actions will provide early recognition for potential emergency situations, and allow TtEC to instigate necessary control measures. However, if the SS and the SSHO providing support determine that control measures are not sufficient to eliminate the hazard, 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.

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 and SSHO and render the appropriate level of response and support as is included in these plans.

Base emergency services (spills, fires, MEC emergency) or offsite emergency responders (medical emergency) are capable of providing the most effective response to site emergencies in the event of a fire or explosion, injury or medical emergency. The PM or SHM will be notified as soon as possible after an emergency as well as the OICC and RPM as stated in this APP.

The Base has instituted a requirement for all personnel to take shelter for personal safety in the event of certain emergencies. The procedure for sheltering in place is included in Section 9.2.1.3.

TtEC personnel will provide incipient 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
- Initial medical support for injury/illness requiring only first aid-level support

## 9.2.1 Procedures and Tests

### 9.2.1.1 *Pre Emergency Planning*

Based on the nature of the planned activities, emergencies resulting from physical (including MEC) or chemical hazards, fires, or explosions 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 and/or 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 are compatible with existing emergency response procedures and Facility procedures.
- Establishing and maintaining information at the project staging areas (support zone [SZ]) for easy access in the event of an emergency.
- Creating and maintaining documents on site that can be important in the event of an emergency situation, including:
  - A chemical inventory of hazardous chemicals on site
  - Corresponding MSDS/SDS
  - Completed medical data sheets (Appendix E) for on-site personnel
  - An entry/exit log identifying personnel on site each day, including any entry into controlled work zones
  - Hospital route maps with directions from each site location
  - Emergency notification - phone numbers

- At the beginning of the field work, the EC will hold an emergency evacuation drill.

The drill requires evacuations of the site to the assembly area (main gate) and to the evacuation area (main gate). At the evacuation area, the SSHO will brief the crew on the routes to reach the hospital. The SSHO and SS will, after the drill, conduct a written debrief meeting with all participants. The SSHO will prepare a short report with recommendations for improvement of the evacuation plan.

#### *9.2.1.2 Personnel and Lines of Authority for Emergency Situations*

The SS will serve as the EC until emergency response personnel arrive on site and take command. If the SS is not present or is involved in the incident, the SSHO is the alternate EC. In the event of an emergency, personnel will evacuate (unless it is a Base Shelter-in-Place type emergency, see below) and the EC will be in charge until emergency responders arrive and take command. TtEC will not provide emergency response support beyond their on-site capabilities and their training.

#### *9.2.1.3 Emergency Signal, Assembly and Evacuation Procedures*

### **Shelter-In-Place**

The Base has instituted a requirement for all personnel to take shelter for personal safety in the event of certain emergencies. The most appropriate protective action for certain emergencies is to take shelter. Personnel shall immediately seek shelter while an assessment is made of the threat and determinations are being made regarding subsequent actions such as "all clear" notifications.

The following procedures have been put in place in the event of an emergent condition that the Facility declares as Shelter-in-Place:

- **NOTIFICATION:** The primary means of alerting personnel shall be emergency alert signals given by the Base. The alerting signal to seek shelter shall be **three steady tones that last for thirty seconds separated by ten seconds of silence.**
- **SHELTERING:** When personnel hear the alert signal, the area of work must be secured in a manner that will leave the site in safe condition. Personnel shall seek shelter in the nearest occupied building (building location to be determined in consultation with the OICC) in calm and orderly manner. If possible, secure all windows and doors and shut off ventilation. If in a vehicle, park the vehicle so that it does not block the normally traveled portion of the road and proceed into the nearest occupied building.
- **ALL CLEAR:** The notification for "all clear" shall be **three short tones repeated three times.**

### **TtEC Initiated Emergency**

In the event of an emergency situation such as fire or explosion, where TtEC is making the

determination to evacuate the site, the EC will activate an air horn (or vehicle horn if available) indicating the initiation of evacuation procedures. The emergency signal will be:

- **NOTIFICATION: Long steady beeps will be used to indicate emergency situations. As required, cellular telephone, handheld radio, and voice may be used if the horn is not heard.**
- **EVACUATION:** Personnel will leave the site and assemble at the main gate (shown on Figures 9-1 through 9-4). Supervisors will account for team members and initiate further response and notification. If further evacuation is warranted, personnel will evacuate to the Base exit.
- Once nonessential personnel are evacuated, appropriate response procedures will be enacted to control the situation. Notification will be made to the Navy RPM, OICC, Fire Department or offsite Medical Services) and TtEC internal points of contact.
- **ALL CLEAR: Verbal notification by SS, SSHO, SUXOS or PM must be given to all employees to return to the site.**
- Follow on reporting after emergency response is over.

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 weather conditions, fire or explosion, evidence of acute or unusual signs or symptoms of personnel exposure to potential contaminants; and could also occur due to activities of other contractors or conditions not directly related to site work (Base emergency).

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. As soon as possible, and while the safety of the personnel is being confirmed, emergency agency notification will commence.

The main gate has been designated as the primary evacuation and assembly area for project work activities (Figures 9-1 through 9-4). , however if the main gate is not considered to be safe, an alternate evacuation area and route may be required and will be identified prior to start of site work.

The location of assembly and evacuation areas will be upwind of the site as determined by the wind direction whenever possible. Prior to the start of site activities, and as required thereafter, the SSHO will establish and verify safe egress routes from the site to the assembly and designated evacuation areas and will coordinate this procedure with the subcontractor personnel as required. The SSHO will prepare a drawing or a map that diagrams these safe egress routes and location of assembly areas to keep this plan current if information changes. 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.

Figures 9-1 through 9-4 have been included to show the location of primary evacuation areas and

routes for each site. The SSHO will use this same map to diagram egress routes from work areas to the evacuation area and to the Base exit. From this point, the map showing the route to the nearest emergency hospital (Figures 9-5 through 9-8), **Family Urgent Care of America Clinic**, in Jacksonville, North Carolina will be used if medical services are required (See Section 9.2.6 below). This hospital can handle moderate emergencies. However this is not the hospital where an ambulance will take an injured employee and does not provide services outside of the hours of 0730 to 1900 (7:30 AM to 8:00 PM). The Emergency Hospital and trauma care facility is the Onslow County Memorial located at 317 Western Blvd in Jacksonville North Carolina.

#### 9.2.1.4 Emergency Equipment

The following emergency equipment listed in Table 9.1 will be strategically placed and maintained on site in accessible locations where active work is taking place:

**Table 9.1 Emergency Equipment and Locations**

<b>Equipment</b>	<b>Location</b>
Industrial First Aid Kit with Bloodborne Pathogens Kit	SZ for active work locations
Fire Extinguisher, one 6A:80BC	SZ for active work locations
Fire Extinguisher, one 1:A:10BC	Site vehicles and heavy equipment
Fire Extinguisher, one 40-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)	Active work location
Spill Kit (appropriately stocked with sorbent pads, socks, gloves, and bags)	Each active working area and refueling areas
Cellular Telephones and handheld radios	Minimum of SS and SSHO (others as required for safety and communication purposes)

- Fire extinguishers will be maintained on site and shall be immediately available for use in the event of an emergency.
- If fuel will be transferred from portable fuel cans, they will be UL approved safety cans properly labeled.

Fire extinguishers will be inspected monthly to ensure:

- Sufficient charge
- No physical damage
- Tamper indicators are in place
- Up-to-date inspection tag

Site personnel will be trained in the use of the fire extinguisher as part of site-specific training.

### 9.2.2 Spill Plans

This Section is prepared in complement to the spill response and reporting procedures included in the Environmental Protection Plan (EPP) and both sets of procedures will be reviewed by project staff. This plan deals with response and notification from a health and safety standpoint, while the EPP focuses on prevention of spills as well as cleanup and notification for spills to the environment, including agency notification and what spills are reportable to outside agencies:

In the event of a spill (any amount, regardless of how small):

- The SS or SSHO will notify the PM, OICC, and the Facility Environmental Department.
- The PM will notify the RPM.
- The SSHO will notify the SHM.
- Any spill quantity is reportable the OICC, Facility Environmental Department, as well as to the PM and SHM.
- TtEC will assist the OICC with any required notification to regulatory agencies if the spill is reportable (refer to Environmental Management Plan).
- In no case will TtEC report a spill to a regulatory agency without first notifying the OICC and Facility Environmental Department and gaining permission.
- An investigation and incident report will be prepared and corrective actions identified.

### 9.2.3 Firefighting 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 (minimum 1:A:10BC) 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 onsite, call (or designate someone) to call 911 (Facility Fire Department) 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 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. If fire extinguishers and other hazardous materials will be sent by a carrier, TtEC will ensure that the proper hazardous material declarations are prepared by a qualified individual for ground shipment only.

#### 9.2.4 Posting of Emergency Telephone Numbers

The list of emergency telephone numbers in Table 9.2 will be maintained at the telephone communications points, which will be located on a clip board in each site vehicle. Please note, the Environmental Protection Plan contains additional numbers for reporting spills to outside agencies, and these are not included in the table.

#### 9.2.5 Man Overboard/Abandon Ship

Not Applicable

#### 9.2.6 Medical Support

##### *9.2.6.1 First Aid*

TtEC will ensure that a minimum of two people, including subcontractors have current certifications in CPR, AED, first aid, and bloodborne pathogens. 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 may include stabilization and transport (e.g., in TtEC site vehicle) to an urgent care or occupational medicine clinic. The SSHO will evaluate the location of the nearest occupational medicine provider by contacting WorkCare<sup>®</sup> during mobilization for these non-emergency injuries or illnesses. WorkCare<sup>®</sup> 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.

**Table 9.2 Emergency Contact List**

Ambulance/Fire/Police (cellular or land line)		<b>911</b>
Medical	<b>Family Urgent Care of America</b> <b>2580 Henderson Dr., Jacksonville, NC</b> <b>(See Figures 9-5 through 9-8)</b>	<b>911</b> (910) 346-1188
Medical	<b>Onslow Memorial Hospital</b> <b>317 Western Blvd., Jacksonville, NC</b> <b>(ambulance transport)</b>	<b>911</b> (910) 577-2240
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 RPM, Bryan Revell		(757) 322-4636
Facility Explosive Ordnance Disposal		Primary POC - 910-451-3064 (Blackburn) Alternate POC - 910-451-3004/5 or 911 (Provost Marshall's Office) 2nd Alternate POC - 910-449-0558/2104 (EOD)
TtEC PM, Mark Pisarcik		(757) 518-8491 (office phone) (757) 544-2085 (cellular phone)
OICC – ET, Jeff Enos		(910) 451-4318
OICC – CM, Jason Manning		(910) 451-2581 x 5264
Facility Environmental Management Division, Jenni Reed		(910) 451-9017
TtEC SHM, Roger Margotto, CIH		(619) 471-3503 (office phone) (619) 988-0520 (cellular phone)
TtEC SS, Gary Phelps		(757) 328-7643
TtEC SSHO, Gary Phelps		(757) 328-7643
Other subcontractor key personnel contact information (e.g., supervisors) will be added at a later date.		

**Abbreviations and Acronyms:**

CIH – Certified Industrial Hygienist	NTR – Navy Technical Representative	SSHO – Site Safety and Health Officer
OICC – Officer In Charge of Construction	PM – Project Manager	SHM – Safety and Health Manager
ET – Engineering Technician	RPM – Remedial Project Manager	TtEC – Tetra Tech EC, Inc.
CM – Construction Manager	SS – Site Superintendent	

### 9.2.6.2 Medical Emergency

In the event of a medical emergency, first aid and CPR assistance will be provided by CPR, first aid, and, if an AED is onsite, AED 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 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 (e.g., ambulance service) 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, CPR, and AED (if available) as necessary.
- Obtain emergency medical services for ambulance transport to a local hospital by calling 911 from a cell phone or landline. 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 intersection), request medical assistance, and provide a name and telephone number.
- 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 OICC. The PM will notify the RPM

The nearest emergency hospital to each of the work sites is the **Family Urgent Care of America, located at 2580 Henderson Drive, in Jacksonville.**

The 24-hour advanced care and trauma hospital is **Onslow Memorial Hospital, located at 317 Western Blvd. in Jacksonville.** This is the hospital that ambulance dispatch will be provided from and to.

The location of and directions to **Family Urgent Care of America** is included in Figures 9-5 through 9-8, and contact numbers for both hospitals including WorkCare<sup>®</sup> are provided in Table 9.2 above. The SSHO is instructed to drive by the nearest hospital to ensure that it is accessible and available and that the most efficient routes (primary and alternate) are identified during mobilization.

### 9.2.6.3 Fatal Injury

If a fatal injury occurs, the following additional steps will be followed:

- Notify the SSHO immediately.
- Notify the SHM, who will initiate contact with OSHA and other appropriate agencies. The North Carolina (NC) OSHA office contact information is as follows:
  - 8 a.m. to 5 p.m.: call (919) 779-8560 or (800) 625-2267
- The work activities on the project must be stopped for 24 hours.
- Assist the SHM and OSHA, NCOSHA, as directed.

#### *9.2.6.4 Medical Data Sheet*

Each field team member, including visitors and subcontractors, will be asked to complete and submit a copy of the Medical Data Sheet (see Appendix E). This sheet will be provided to the 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. Any pertinent information regarding allergies to medications or other special conditions should be documented. This data sheet will be maintained confidential by the SSHO and information shared only to the extent necessary to support medical care of the individual.

### **9.3 Plan for Prevention of Alcohol and Drug Abuse**

TtEC has a Drug-Free Workplace Program. All contractors and subcontractors on this project are subject to drug and alcohol testing at any time. Supervisors, managers, and the SSHO are to determine the fitness of their workers, including assessing whether their workers may be under the influence of any alcohol or drugs, including over-the-counter and prescription medications. During the initial site orientation and training conducted at the beginning of the project, all workers are reminded of the program and policies. The program and policies are also described in the Work Rules. Workers are encouraged to confidentially list their medications on a medical information form that is provided to them and retained by the SSHO. If a worker is injured or involved in an accident, the worker(s) involved may be asked to be tested. If a supervisor observes any worker who appears to be under the influence of drugs or alcohol, he/she may request testing of the worker.

### **9.4 Site Sanitation Plan**

TtEC will provide portable toilet and hand washing facilities at the project worksite. These facilities will be serviced as necessary, but no less than on a weekly basis, maintained in good condition, and located in an accessible location for active work being performed.

Workers will discard all food debris and other detritus in a designated refuse container. Project wastes generated from the field activities will be packaged and disposed of as specified in the Waste Management Plan following applicable federal, state, and local laws and regulations and Facility instruction.

Potable water will be provided for washing hands and face and for any drinking water provided to employees.

## **9.5 Access and Haul Road Plan**

Not applicable. TtEC will not construct haul roads. TtEC will utilize existing roadways and paths to the extent possible to access work locations where the remedial action will be performed; however temporary haul roads may be constructed, as necessary and signage will be posted to direct incoming and outgoing traffic. Areas where construction equipment operates and where controlled work zones are established will be marked and controlled to prevent unauthorized access or conflicts with other operations and tenants. Appropriate barricades and warning signs will be posted to control access and prevent accidents. As required, the SS will coordinate with the NTR and base designated point of contacts.

## **9.6 Respiratory Protection Plan and PPE**

This section outlines the respiratory protection and PPE to be used on this project as well as reasons for downgrade or upgrade. PPE for site workers is selected and used based upon the existing and potential hazards anticipated, and the requirements of 29 CFR, Part 1910.120. Different levels of personal protection will be provided to workers depending on specific work tasks performed. The selection of PPE also requires an evaluation of chemical contaminants, concentrations of these chemical contaminants, and physical hazards that may be encountered.

### **9.6.1 Respiratory Protection Plan**

The need for respiratory protection for this project not anticipated to be required based on the scope of work activities, assuming tanks to be removed are gas free. Air monitoring will be performed as specified in Section 7.0 of the SSHP in worker breathing zones to ensure workers are not exposed to hazardous vapors. Dust will be monitored during site activities and dust control measures will be implemented, as necessary. Good dust control practices will help to reduce inhalation of respirable dusts including silica dusts from demolition debris and concrete cutting.

It is anticipated that the tank contents in the ASTs consisted of ultra low sulfur diesel (ULSD) fuel oil. No entry of the AST at Site HP1700 will be conducted because the tank contained Tri-act 1820, and this is considered a hazardous substance/waste.

At the present time, no cleaning agents are anticipated to be used to clean the tank. Should the subcontractor require use of a cleaning agent (other than water spray), the hazardous material table in Appendix G will be updated to include information on the product and an MSDS or SDS will be included.

Exposure monitoring must be performed where exposure to hazardous vapors or other contaminants that could exceed the Permissible Exposure Limit (PEL) is possible. The exposure monitoring strategy for this project the AST cleaning and removal task is included in this section. The SHM is responsible for evaluating this strategy and the SSHO who has had training on the use and limitations of this equipment, will work with the SHM for its implementation on site.

Ambient air measurements for volatile organic vapors will be collected in the breathing zone of site workers during contaminated soil excavation, handling, and sampling, tank pumping and cleaning operations, and during confined space entry. The purpose of this monitoring is to ensure that 1) vapor levels do not pose an inhalation hazard to site personnel, 2) the appropriate level of PPE is being used, and 3) potentially explosive environments do not exist. Organic vapor levels will be measured with a properly calibrated MultiRAE® or other photoionization detector (PID), as approved by the SHM. Whenever MultiRAE® or other PID results indicate the presence of vapor contamination as described in the Action Level table (Table 9-3), additional differential-air sampling will be conducted using a colorimetric indicator tube sampler equipped with benzene tubes.

Total organic vapor levels equal to or less than 10 (parts per million) ppm above background will be considered acceptable. Vapor levels in excess of this limit will result in the suspension of work until ambient vapor concentrations have dissipated to a safe level. If work must continue in levels greater than 10 ppm, the SHM will evaluate the situation with the SSHO and recommend additional exposure control strategies, such as having site personnel wear a respirator. If benzene levels (only if benzene is present in analytical results of tank content) exceed 0.5 ppm using Sensidyne tubes, personal exposure monitoring for benzene will be conducted (unless levels are below 0.5ppm as measured by the Sensidyne tubes, in this case workers will be wearing full face respirators with organic vapor cartridges).

In addition to exposure monitoring described above, either a or a properly calibrated MultiRAE® equipped with calibrated oxygen and LEL sensors will be used to monitor potentially explosive atmospheres in work areas that could contain and concentrate petroleum vapors at concentrations 10 percent or greater LEL), such as during pumping of tanks and during confined space entry. Prior to and during confined space entry, LEL, oxygen as well as hydrogen sulfide (H<sub>2</sub>S), and carbon monoxide (CO) will also be monitored to ensure action levels are not exceeded and potential exposures remain below the PEL (See Table 9-3).

The SSHO will collect all air measurements regularly in the work area. Calibration and maintenance of monitoring equipment will be in compliance with the manufacturer's specifications and will be performed and documented prior to daily monitoring. The PID will be equipped with a 10.6 electron volt lamp which is appropriate for screening use around fuel related chemicals such as gasoline, diesel, and/or fuel oil. Calibration records will be kept in the project health and safety files. The PID will be calibrated to isobutylene before each day of use..

All direct reading air sampling results from the previous day will be discussed with the site crews at the morning tailgate safety meeting. Personal exposure monitoring (if benzene tube exposure sampling is performed) results will be communicated to the individual sampled in a letter that will be delivered no later than 1 week after the testing results have been received. Personal monitoring results will also be discussed with crews whose exposure is represented by the monitoring event.

The above-mentioned instrument readings will be compared to the actions levels listed in Table 9-3.

**Table 9-3 Real-Time Air and Personal Exposure Monitoring Action Levels**

Monitoring Instruments	Activity	Action Level	Site Action
Photoionization detector (e.g., Multi-RAE®)	Handling contaminated soil or fuel product Confined Space Entry	>background but <10 ppm	Continue working. Use Sensidyne tubes to monitor for benzene ( <b>only if benzene is present in analytical results above 1 ppm</b> ).
		>10 ppm and < 50	Discontinue work. Shut down equipment. Evacuate space. Call SHM (full face APR may be required).
		> 50 ppm	Supplied air required (depending on analytical results)
Monitoring Instruments	Activity	Action Level	Site Action
Sensidyne tube sampler equipped with benzene tubes. (Tube Benzene 0.5/a or Benzene 0.5/c)	Handling contaminated soil or fuel product Confined Space Entry	>0.5 ppm but <1 ppm	Conduct personal exposure monitoring for benzene. Wear Level C PPE.
		>1 ppm but <10 ppm	Full face respirator with OV cartridges
		>10 ppm	Stop work. Call SHM.
Multi-RAE®) equipped with LEL O <sub>2</sub> , CO, and H <sub>2</sub> S sensors	Handling contaminated soil or fuel product (LEL only) Confined Space Entry (4 gas)	< 10 % LEL	Continue working. With continuous monitoring
		≥ 10% LEL	Exit tank if in tank. Ventilate area until < 10% LEL.
		> 20.8% & <22% O <sub>2</sub>	Exit tank and ventilate. Monitor.
		10 ppm CO or greater	Exit tank and ventilate. Monitor.
		5 ppm H <sub>2</sub> S (50% PEL)	Exit tank and ventilate. Monitor. Stop work. Call SHM if levels remain above this action level.
APR – Air Purifying Respirator		PEL – Permissible Exposure Limit	
CO – carbon monoxide		PPE – personal protective equipment	
H <sub>2</sub> S – hydrogen sulfide		ppm – parts per million	
LEL – lower explosive limit		SHM – Safety and Health Manager	
O <sub>2</sub> – oxygen			

Personnel exposure sampling and analysis will be done in accordance with current approved NIOSH methods. Laboratory results and follow-up actions and recommendations will be reviewed and approved by the SHM (project CIH). Air monitoring results, after the sample results are signed by the testing laboratory, will be sent to the employee performing the air monitoring, the employee who analyzed the sample, and the CIH. Employees will be notified of their exposure monitoring results in accordance with OSHA regulations and standards and will be informed of their rights to medical information in accordance with OSHA regulations.

#### 9.6.2 Personal Protective Equipment

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 are listed in the AHA matrix and include the date the evaluation was conducted, the activity evaluated, PPE recommendations, and the name of the person(s) performing the assessment.

The basic level of PPE selection, as required by 29 CFR 1910.132, on the project site are a standard work uniform consisting of long pants and long sleeved shirt and includes a hardhat when overhead hazards are present, safety glasses, safety boots that comply with ASTM F2412 and ASTM F2413 (except during geophysical operations), leather work gloves, work clothes, high visibility Class 2 safety vests, ear plugs when around power tools and heavy equipment, and weather-appropriate clothing.

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.
- Entry into tanks requires upgrading.

PPE required for entry into ULSD tanks includes use of poly raingear (coat/pants) or poly-coat Tyvek, nitrile/chemical resistant gloves in addition to the basic level of PPE detailed above.

Reasons to downgrade level of protection

- New information indicating that the situation is less hazardous than was originally anticipated.
- Change in site condition that decreases the hazard.
- Change in work task that will reduce contact with hazardous materials.

If hazardous materials are in use on the project, the MSDS will be evaluated to determine the need for any additional PPE (e.g., chemical protective gloves) when for use of these products.

Additional tasks not included in the AHA matrix will be reviewed by the SSHO and SHM. Any additional PPE requirements will be incorporated into the APP by completing a field change request (FCR) form. The FCR forms and PPE selection will require approval by the SHM.

## **9.7 Health Hazard Control Program**

The primary health hazards associated with this work are physical hazards associated with heavy equipment, fire hazards associated with hot work and the presence of flammable vapors, mechanical lifting hazards, and hazards associated with tools and equipment operations.

There are also numerous construction-related or environmental physical hazards including but not limited to noise, slips, trips, and falls, heat or cold stress, and potential for severe weather. Biological hazards may be present onsite as well and include bloodborne pathogens (e.g., if first aid or CPR are required) as well as the potential for contact with poisonous plants, snakes, and bites or stings by insects.

TtEC will create systems and procedures to prevent and control physical, chemical, biological, and environmental hazards identified through the risk analysis. The hierarchy of controls is engineering, administrative, work practice, and PPE. Whenever feasible, engineering, administrative, or work practice controls will be instituted even if they do not eliminate the hazard or reduce exposure. Use of such controls in conjunction with PPE will help reduce the hazard or exposure to the lowest practical level. Where no standard exists, creative problem-solving will be used to create effective controls. 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

Section 1.2 of the SSHP includes the site description and contamination characterization.

Section 2.3 of the SSHP identifies the chemical hazards and mitigation measures to reduce those hazards.

Section 2.4 of the SSHP identifies and describes physical hazards and mitigation measures to reduce those hazards where otherwise not already included in this APP.

Section 2.5 of the SSHP addresses biological hazards (e.g., animals, poisonous plants, insects, snakes).

## **9.8 Hazard Communication Program**

Specific hazardous materials or chemicals that will be brought onto the project site are

anticipated to be minimal (e.g., fuel, oil, lubricants necessary to perform routine maintenance of or operation of equipment and spray paint for marking ground). When any material or chemical is brought onto the site, a MSDS/SDS must be provided to the SSHO. This includes all hazardous materials brought onsite by the subcontractors for their operations. Copies of MSDSs/SDSs are included in Appendix F of this APP.

The SSHO will include all MSDSs in an Appendix F to the APP in the field and a copy will be available in the field office. The SSHO will review the MSDSs 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 SSHO when any new material is brought onto the site. The Environmental Protection Plan also requires that a hazardous material inventory be maintained and prohibits the use of hazardous materials that contain certain chemicals from being used on the site.

All containers will be labeled specifying the content and hazards of the material in the container. An inventory will be maintained citing the location and quantities held. All workers will have received training in the GHS labeling, marking, and SDS formats.

#### **9.9 Process Safety Management Plan**

Not applicable.

#### **9.10 Lead Abatement Plan**

Not applicable.

#### **9.11 Asbestos Abatement Plan**

Not applicable.

#### **9.12 Radiation Safety Program**

Not applicable.

#### **9.13 Abrasive Blasting**

Not applicable.

#### **9.14 Heat/Cold Stress Monitoring Plan**

There is a potential for heat stress and cold stress or related injuries during the performance of the planned activities at t from exposure to ambient temperatures and season in which the work is conducted, effects of wind chill, 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. The SSHO will implement TtEC EHS Procedure 4-6, Temperature Extremes.

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.
- Monitor temperature with a wet bulb globe thermometer (WBGT).
- Modify work/rest schedules according to monitoring requirements.
- Mandate work slowdowns as needed.
- Perform work during cooler hours of the day, if possible, or at night if adequate lighting can be provided.
- Perform physiological monitoring.
- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.
- Maintain worker's body fluids at normal levels. This is necessary to ensure the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat, e.g. 8 fluid ounces (0.23 liters) of water must be ingested for approximately every 8 ounces (0.23 kilograms [Kg]) of weight loss. The normal thirst mechanism is not sensitive enough to ensure that enough water will be consumed to replace lost sweat.
- 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 when impermeable clothing is worn.

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 Kg) of weight loss. The normal thirst mechanism is not sensitive enough to ensure that enough water will be consumed to replace lost sweat.

Cold weather in North Carolina 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 9.4), this accounts for the progressive signs and symptoms ranging from sluggishness and slurred speech to disorientation and eventually unconsciousness.

**Table 9.4 Progressive Clinical Symptoms of Hypothermia**

Core Temperature	Clinical
95°	Maximum shivering.
87° - 89°	Consciousness clouded; blood pressure becomes difficult to obtain; pupils dilated.
84° - 86°	Progressive loss of consciousness; muscular rigidity; respiratory rate decreases.
79°	Victim rarely conscious.
70° - 72°	Maximum risk of ventricular fibrillation.

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 North Carolina 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.

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.

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.

#### **9.15 Crystalline Silica Monitoring Plan (Assessment)**

Crystalline Silica exposure is possible during the removal of existing concrete and building demolition. Long periods of exposure are not anticipated. Exposure to respirable dusts will be mitigated by continuous watering at the concrete breaking point, using a garden hose, or similar. If concrete activities present a potential for long periods of exposure and/or if the SSHO determines that the dewatering method is not adequate, additional measures will be taken. Additional measures may include air monitoring using a real-time aerosol monitor (RAM) (mini, Data, or equivalent to ensure that the respirable dust levels are not greater than 0.1 mg/m<sup>3</sup>).

#### **9.16 Night Operations Lighting Plan**

Night operations are not anticipated to be required during the remedial action. All work will be performed during daylight hours.

#### **9.17 Fire Prevention Plan**

Fire prevention and protection measures require preplanning. At least one 10A:20BC fire extinguisher will be located at each work area and at least one 1:A: 10-BC fire extinguisher will be located within each site vehicle and each piece of heavy equipment.

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, SS, or SSHO in accordance with Base instruction. There is no smoking allowed within the fence area.

- Personnel will follow hot work procedures to ensure that work is performed in a safe environment. Hot work is anticipated for AST cutting and welding operations.
- Refueling will be performed only in a designated area.
- Equipment must be refueled with the equipment turned off (except under special circumstances as required by an operator's manual).
- 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 other flammable liquids will be stored in an approved storage cabinet, unless they are for immediate use.
- 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.
- Any spills will be promptly cleaned up and sorbent materials will be placed in a closed metal container for disposal.

Hot work may be required during AST cutting and welding activities. However, 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 permit system will be implemented if any work is considered to be hot work, including fire watch. In addition, a Base hot work permit will be obtained from the Base Fire Department.

In the event of a fire or explosion, contact the appropriate emergency authorities by calling 911 as specified in Table 9.2 – Emergency Contact Information. Any fire must also be reported to the RPM, OICC, PM, and SHM. The person reporting the fire is required to provide the following information to emergency personnel:

- His/her name
- Location of the fire
- 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

The OICC in coordination with the SS will manage notifications and follow-on reporting as required.

### **9.18 Wild Land Fire Management Plan**

Not applicable.

## **9.19 Hazardous Energy Control Plan**

Not applicable.

## **9.20 Lift Plan**

Hoisting may occasionally be required for loading and unloading of equipment and materials as well as lifting of ASTs. Lifting by this means is not a critical lift because critical lift plans are required only for cranes. Lifts by other equipment are limited by the type of equipment used and such lifts are limited by restrictions imposed by the manufacturers of the equipment used. This section addresses both crane operations and hoisting and rigging performed by construction equipment that may be performed on this project.

### **9.20.1 Crane Operations**

Crane operation is not anticipated. For crane operations, a lift plan would be prepared by a competent person and submitted to the OICC for review and approval. If the lift is determined to be a critical lift load greater than or equal to 75%), a professional engineer's approval would be required prior to initiating the lift. All crane operations would be conducted in accordance with EM385-1-1 Section 16. An AHA would be prepared by the lifting subcontractor and submitted to the SHM and OICC for approval. All personnel involved in this activity would review and comply with EM385-1-1 Section 16 as well as the AHA.

### **9.20.2 Hoisting and Rigging**

#### **9.20.2.1 *General Requirements***

Hoisting operations will be suspended during excessive inclement weather at the discretion of the Competent Person. Gary Phelps) is the Competent Person for TtEC. Equipment manufacturer's recommendations will be followed to determine ability to perform safe hoisting operations based on wind calculations.

All rigging used in hoisting operations will be inspected by the Competent Person 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 are to be performed. 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, and being cut or pinched while handling loads or its rigging. Other hazards could include equipment rollover or boom collapse due to side loading. 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 equipment configuration and manufacturer's instruction.
- Only authorized and qualified persons will be involved in hoisting and rigging operations. 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 crane or 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.
- 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 and unstable surface conditions. Hoisting operations will only be performed if adequate space is available for maneuvering and on stable ground surfaces.

#### 9.20.2.2 *Hoisting and Rigging 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 will be used for hoisting operations. If manufacturer procedures for lifting and transport of hoisted loads are unavailable, the equipment will not be used for hoisting. Because hoisting and rigging using mechanical equipment will be performed on this project, an AHA has been prepared 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, have been incorporated into the AHA in accordance with Section 16.S.03.a. The AHA includes 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 Competent Person 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 present or upon request). 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.

### **9.21 Contingency Plan for Severe Weather**

The potential for severe weather is possible as the site is located near the Atlantic Ocean where storms can occasionally be severe, including hurricane force winds. In addition, thunderstorms are possible. The SSHO will monitor the weather forecast daily. In preparation for an approaching storm, all equipment will be secured, and all doors and windows of the equipment and offices will be closed. All tools and supplies will be stored in a designated secure location. Current work tasks will be safely idled and secured as necessary.

If particularly ominous weather conditions are predicted, the SSHO will monitor radio broadcasts or National Weather Service reports regularly. Nearby thunderstorms could have lightning associated with them. Whenever a thunderstorm arises, the SSHO will determine if lightning is within 10 miles of the site. If lightning is close to the site, work will stop until no lightning activity is observed for a minimum of 30 minutes and workers will seek shelter in a full enclosed vehicle cab or other fully enclosed structure. A lightning meter will be available on-site as an indicator of approaching storms.

The SS and the SSHO will assess what work procedures can be safely performed when wind conditions exceed 25 mph, lesser wind speeds may require consideration of work suspension for certain tasks. They will also give consideration to fugitive dust and odor emissions, the safety of equipment in high winds, and protection of workers from flying debris and dust in windy conditions.

### 9.21.1 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 eye-wall, 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 will have supervisors and workers take precautions to minimize danger to persons, and protect the work and nearby 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 Government property.

It is advised that before an emergency, each contractor secure emergency disaster kit with non-perishable food, potable water and other supplies (e.g., flashlights, first aid kit, emergency sideband radio or weather radio, 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 and SSHO will comply with the following directives and direct contractor and subcontractor personnel as follows:

- **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.
- **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 Contracting Officer for weather and Condition of Readiness updates and completion of required actions.
- **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 Contracting Officer for weather and Condition of Readiness updates and completion of required actions.
- **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 Government premises and each supervisor will ensure their personnel gather together offsite in a safe place of refuge such as a storm shelter. TtEC SS 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 TtEC SS and SSHO will (with OICC and Contracting Officer permission) conduct an evaluation of any worksite damages and precautions that may be required prior to returning to work and will report damages to the PM, SHM, and Contracting Officer.

## 9.22 Float Plan

Not applicable.

### **9.23 Site-Specific Fall Protection and Prevention Plan**

It is not anticipated that excavation will be completed to a depth of 6 feet or greater. Excavations exceeding 6 feet deep may present a fall hazard to employees during work activities. To avoid falling due to excavation wall collapse, workers will maintain a 6 foot distance or greater from the edge of excavations. Open excavations will be surrounded with high visibility fencing. In addition, non-entry techniques will be employed to inspect excavations.

### **9.24 Demolition Plan (Engineering and Asbestos Surveys)**

A small brick building and associated piping (including a remote fill) will be demolished at site G650, Camp Geiger. A hazardous substance survey will be conducted for the building, including interior and exterior, prior to commencing demolition and removal activities. Though not anticipated, hazardous materials associated with this structure will be removed and disposed in accordance with appropriate regulations and guidance. The building demolition will be conducted by using a backhoe and track hoe with a thumb. During the building demolition, the concrete sidewalk and the concrete box at the end of the sidewalk will be removed for disposal/recycling. The building and concrete debris will be loaded into roll off containers for staging and subsequent disposal/recycling. Care will be taken to not generate dust, and if dust is visible, it will be controlled by wetting down with water.

### **9.25 Excavation/Trenching Plan**

Excavations greater than 4 feet deep are not anticipated. Shallow excavations may be completed for subsurface product line exposure and removal. Excavations greater than 4 feet deep will be treated as a confined space and therefore, confined space procedures would need to be implemented if workers enter these excavations (not anticipated). In addition, for excavations that are 6 feet or greater in depth, field personnel must be at least 6 feet from the edge of the excavation unless fall protection systems are used. Fall protection systems include guard rails or personal fall arrest systems. For excavations greater than 4 ft deep, work will be completed using non-entry techniques. 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:

- Excavation areas may be identified on site drawings. The location will be evaluated for presence of underground and overhead utilities and a utility search (including a One-Call, 811) will be conducted in accordance with TtEC Corporate Procedure EHS 3-15 to verify and mark underground utilities. Overhead power lines or other overhead hazards that the excavator bucket or boom could contact or come within 15 feet of, will be disconnected through contact with the utility provider. The SS will verify power disconnects.
- Air lances, shovels, or other non-intrusive methods may be used to dig an excavation to ensure underlying utilities are not damaged. Utility lines that traverse an excavation may be shielded and/or supported, as necessary.

- Unless otherwise designated, the Gary Phelps, is considered to be the excavation competent person. The competent person will have a background in soil mechanics or previous construction experience involving excavations. The PM will ensure that 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.
- Inspections will be performed daily on all excavations, adjacent areas, and protective systems (if used) before personnel enter the excavation. The checklist provided in EHS Procedure 6-3 or equivalent will be used.

### **9.26 Emergency Rescue (Tunneling)**

Not applicable.

### **9.27 Underground Construction Fire Prevention and Protection Plan**

Not applicable.

### **9.28 Compressed Air Plan**

Not applicable.

### **9.29 Formwork and Shoring Erection and Removal Plans**

Not applicable.

### **9.30 Precast Concrete Plan**

Not applicable.

### **9.31 Lift Slab Plans**

Not applicable.

### **9.32 Steel Erection Plan**

Not applicable.

### **9.33 Site Safety and Health Plan for HTRW Work**

The Site Safety and Health Plan is included as Attachment 1 to this APP.

### **9.34 Blasting Safety Plan**

Not applicable. TtEC will perform no MEC disposal activities if MEC is found.

### **9.35 Diving Plan**

Not Applicable.

### **9.36 Confined Spaces**

There are several confined spaces identified for this project, including interiors of ASTs and excavations greater than 4 feet deep. It is not anticipated that excavations will be entered. Tank cleaning activities may be performed using confined space entry techniques. A qualified subcontractor will follow confined space entry (CSE) procedures if entry into tanks is required to accomplish the cleaning and inspection tasks. Confined space entry requirements are detailed below. No person shall enter a tank unless the proper confined space entry requirements are implemented.

A confined space is any enclosed area having a limited means of egress where ventilation is not adequate to remove a toxic or flammable atmosphere or oxygen deficiency that may exist. Examples of confined spaces include, but are not limited to tanks, boilers, vessels, bins, manholes, tunnels, pipelines, underground utility vaults, and any open-top spaces more than 4 feet in depth such as pits, excavations, tubes, trenches, and vessels. Prior to the start and during the conduct of work at each site, the SSHO and the SS will identify confined spaces or confined spaces created by the nature of the work (e.g., excavations, rollovers, etc.). The SSHO will not allow entry into these spaces unless specifically authorized in this plan. The SSHO will evaluate the site for any potential confined spaces and ensure they are appropriately marked with warning signs and that personnel are informed that entry into these spaces is prohibited other than as outlined below.

All 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, 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 CSE by their employer. At the present time, CSE tasks are currently limited to AST cleaning and inspection tasks and will be performed by a subcontractor. TtEC prefers that if work tasks can be accomplished without the need for CSE, this is preferable since CSE can present many hazards. An AHA has been prepared for CSE related to the AST cleaning and inspection tasks should entry into the ASTs be required.

TtEC EHS 6-1 outlines confined space procedures in detail and includes the CSE permit. The CSE will be prepared by the subcontractor performing the CSE. The SHM will review all confined space entry plans and completed checklists and/or permits prior to entry, including those submitted by subcontractors.

Confined space regulations require that the confined spaces be isolated by blocking, blinding, and/or disconnecting of all conveyances leading into the space, and the locking/tagging out, disconnection, or removal of all electrical circuits and mechanical devices servicing the spaces (as applicable). At the present time, it is not anticipated that ASTs will contain electrical circuits or mechanical devices that would require control of hazardous energies, including lockout/tagout procedures.

Atmospheres within the ASTs also must be tested for oxygen deficiency or oxygen enrichment – must be greater than 20.8 and less than 22 percent oxygen (O<sub>2</sub>), flammability – must be less than 10 percent LEL), for carbon monoxide (CO) – must be less than 10 parts per million (ppm), hydrogen sulfide (H<sub>2</sub>S) – must be less than 5 ppm (50% of the PEL), and toxicity (less than PEL) prior to entry (see Action Levels and monitoring requirements in Section 9.6). PPE and respiratory protection requirements for the AST related task is addressed in Section 9.6.

If field instrumentation indicates that concentrations of flammable vapors equal to or exceeding 10 percent of the LEL, work will stop and the area will be ventilated until levels are below 10 percent of the LEL. If oxygen levels are below 20.8 percent or greater than 22 percent, workers will not enter the space. Forced air ventilation and respiratory protection may be necessary if hazardous atmospheres are detected. All test results and controls applied to the space must be noted on a permit entry form that is posted at the entrance to the space. Employees working in these spaces must be trained in confined space hazards and safe work practices as per the above-mentioned OSHA standard.

TtEC's subcontractor performing the CSE is capable of performing self-rescue in the event of a CSE emergency and has CSE rescue-trained personnel. A tripod with a retrieval system will be attached via a harness to the CSE entrant. The CSE team will include an entrant, an attendant,

## **10.0 RISK MANAGEMENT PROCESSES**

AHAs for the planned activities are listed in Table 2.1 of this plan and AHAs are included in Appendix A of this APP. If any new tasks are identified, or if planned activities vary from the written AHAs, the SSHO (with the assistance of the workers or subcontractors, etc.) will develop or alter the existing AHAs to address the specific activities. The AHAs listed will be reviewed by the SHM and will be submitted to the Contracting Officer for review and approval.

## **11.0 REFERENCES**

TtEC. 20014. Project Orientation, Rules and Safety Guidelines Handbook. January 2014.

USACE. 2008. Safety and Health Requirements. Engineer Manual (EM) 385-1-1, Sep 2008 Consolidated. August 2011.

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.

North Carolina Administrative Code. “Title 13 – Labor.” N.p., n.d. Web. 21 October 2013 <<http://reports.oah.state.nc.us/ncac.asp?folderName=\Title 13 - Labor>>.

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## **FIGURES**

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**BASE LOCATION MAP**

**LEGEND:**

AST – Above Ground Storage Tank

CAD FILE: WE21 - FIGURE 1.DWG



TETRA TECH EC, INC.

**MARINE CORPS INSTALLATIONS EAST - MARINE CORP BASE CAMP LEJEUNE**

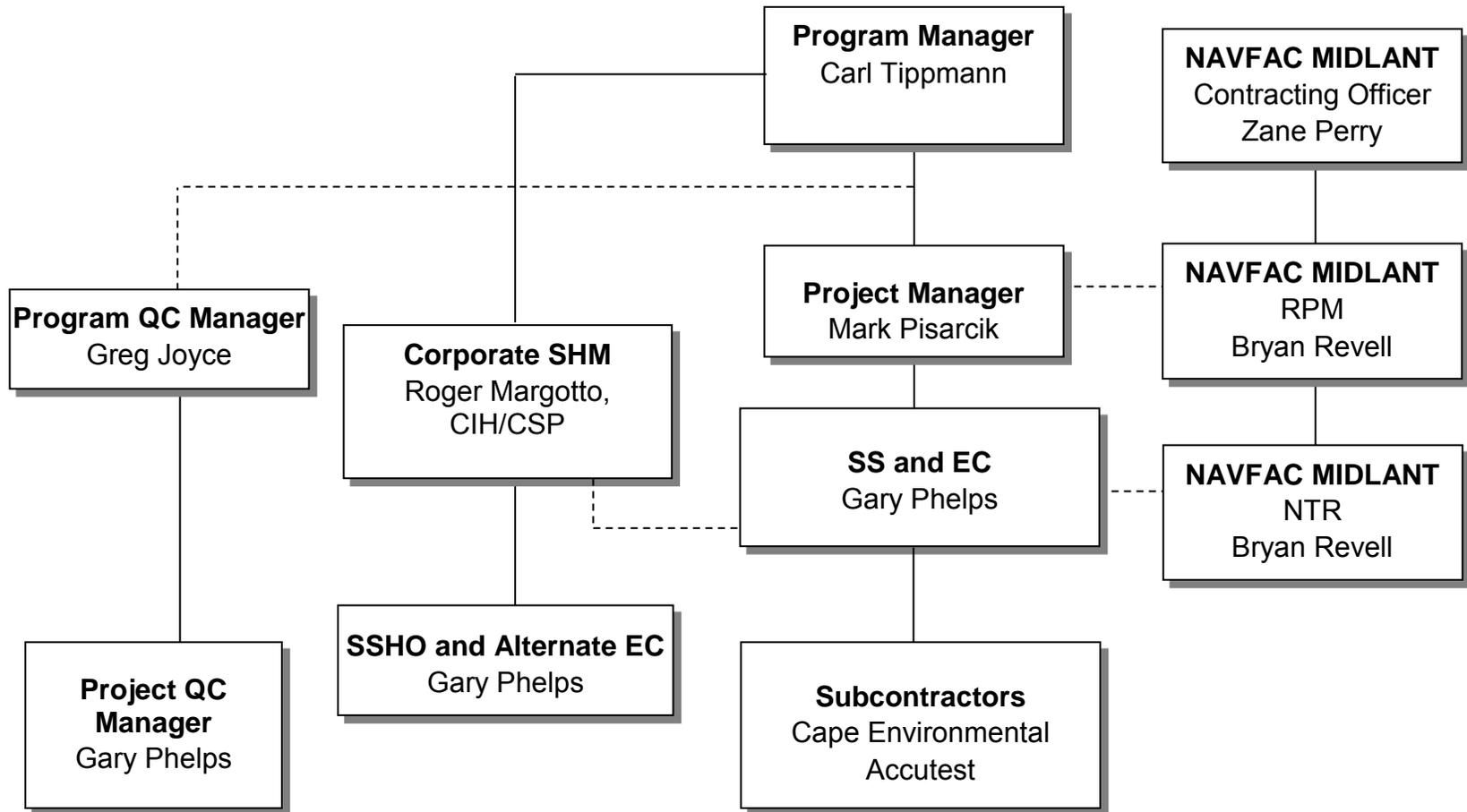
**AST REMOVALS  
SITE LOCATION MAP**

PREP	CHK	APPR	DATE

**FIGURE  
1-1**

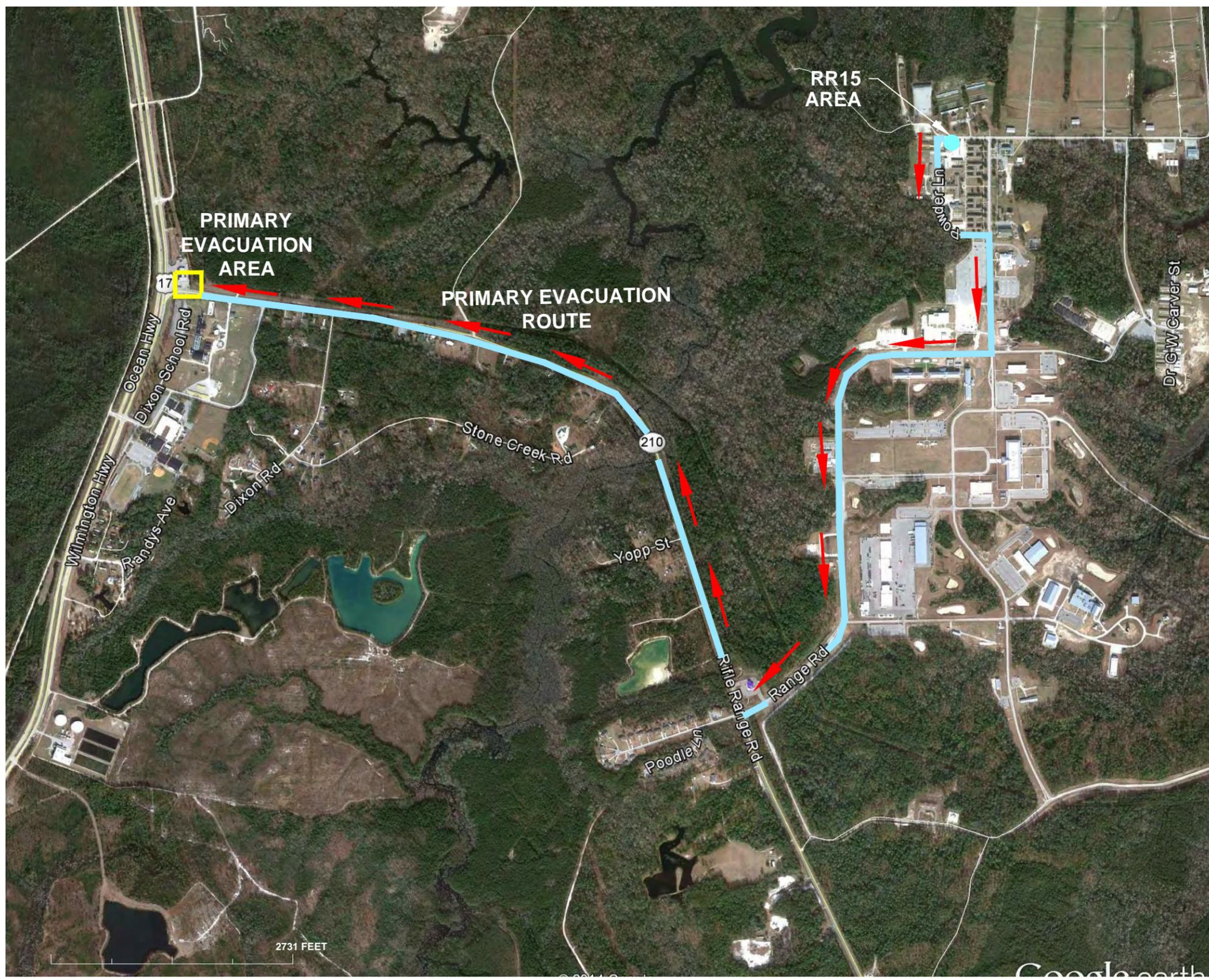
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Figure 4 - 1 Organizational Chart



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CAD FILE: WE21-FIGURE 9-1-RR15.DWG



**LEGEND:**

- PRIMARY EVACUATION ROUTE
- ➔ EVACUATION ROUTE DIRECTION

SOURCE: GOOGLE EARTH PRO

**MARINE CORPS INSTALLATIONS EAST - MARINE CORP BASE CAMP LEJEUNE  
AST REMOVALS  
SITE RR15, STONE BAY  
EMERGENCY EVACUATION ROUTE**

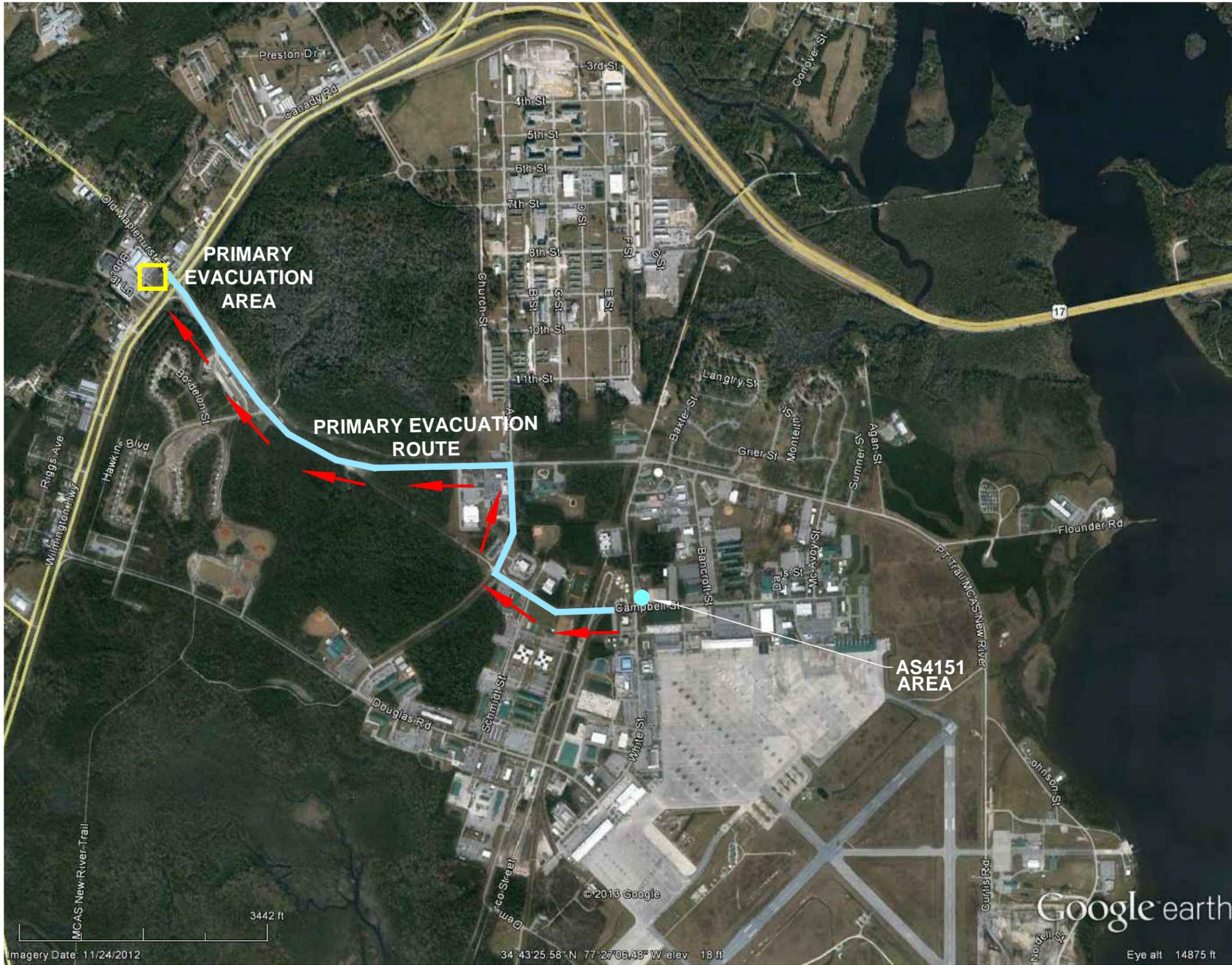
PREP	CHK	APPR	DATE

**FIGURE  
9-1**





CAD FILE: WE21 - FIGURE 9-3 - AS4151.DWG



**LEGEND:**

- ▬ PRIMARY EVACUATION ROUTE
- ➔ EVACUATION ROUTE DIRECTION

**MARINE CORPS INSTALLATIONS EAST - MARINE CORP BASE CAMP LEJEUNE**  
**AST REMOVALS**  
 SITE AS4151, MCAS NEW RIVER  
 EMERGENCY EVACUATION ROUTE

PREP	CHK	APPR	DATE

**FIGURE 9-3**



CAD FILE: WE21 - FIGURE 9-4-HP-1700.DWG



**LEGEND:**

- PRIMARY EVACUATION ROUTE
- ➔ EVACUATION ROUTE DIRECTION

SOURCE: GOOGLE EARTH PRO

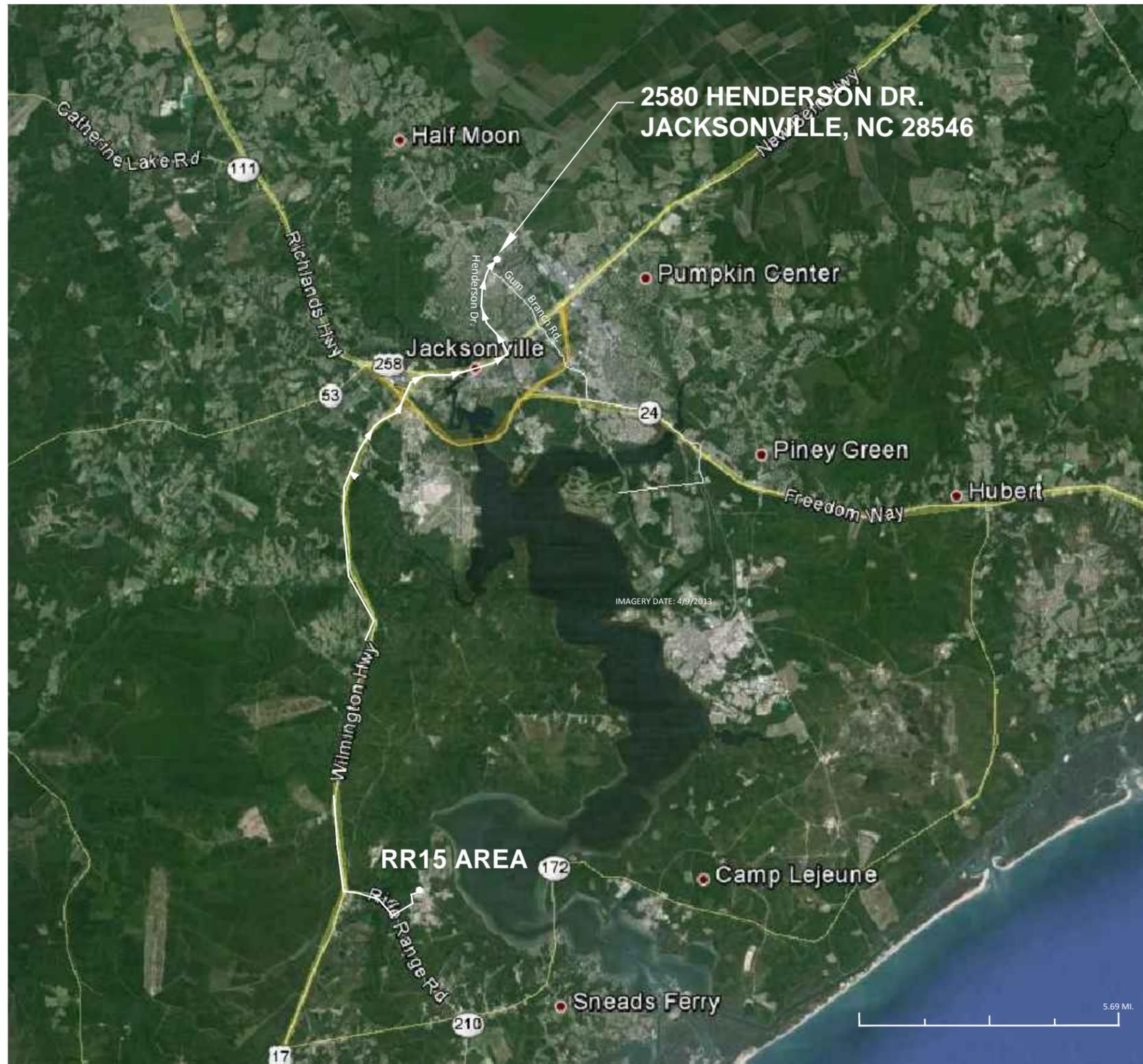
**MARINE CORPS INSTALLATIONS EAST - MARINE CORP BASE CAMP LEJEUNE  
AST REMOVALS  
SITE HP1700, MAIN SIDE  
EMERGENCY EVACUATION ROUTE**

PREP	CHK	APPR	DATE

**FIGURE  
9-4**



TETRA TECH EC, INC.



**DIRECTIONS:**

1. HEAD SOUTH ON POWDER LANE TOWARD RANGE ROAD 0.2 MI.
2. TURN RIGHT AT RANGE ROAD 0.2 MI.
3. TURN RIGHT (RESTRICTED USE ROAD) 0.1 MI.
4. TURN RIGHT (RESTRICTED USE ROAD) 0.5 MI.
5. TAKE FIRST RIGHT TOWARD NC-210 E 0.5 MI.
6. TURN RIGHT ONTO NC-210 E 1.5 MI.
7. TURN RIGHT ONTO US-17 N 11.1 MI.
8. CONTINUE ONTO US-17BUS N 3.2 MI.
9. TURN LEFT ONTO HENDERSON DR.

DESTINATION WILL BE ON THE RIGHT 2.2 MI.  
 2580 HENDERSON DR.,  
 JACKSONVILLE, NC 28546

SOURCE: GOOGLE EARTH PRO

CAD FILE: WE21-FIGURE 9-5-RR15.DWG

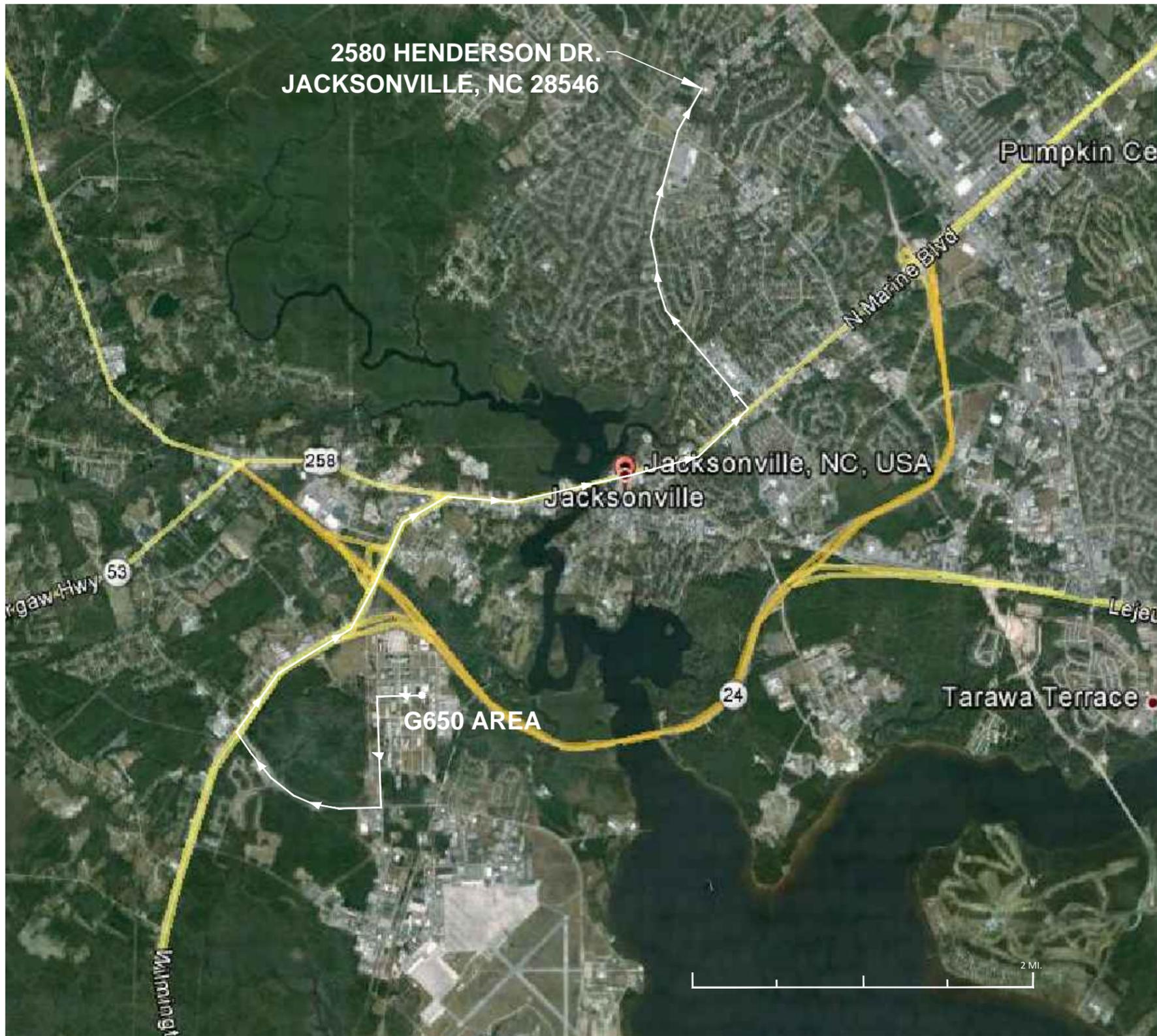


TETRA TECH EC, INC.

**MARINE CORPS INSTALLATIONS EAST - MARINE CORP BASE CAMP LEJEUNE  
 AST REMOVALS  
 SITE RR15, STONE BAY  
 HOSPITAL ROUTE MAP**

PREP	CHK	APPR	DATE

**FIGURE  
 9-5**



**DIRECTIONS:**

1. HEAD WEST ON 6 TH. STREET TOWARD B STREET 0.1 MI.
2. TAKE THE 2 ND. LEFT ONTO "A" ST. 0.8 MI.
3. TURN RIGHT ONTO CURTIS RD. 1.1 MI.
4. TAKE SECOND RIGHT ONTO US-17 N 0.9 MI.
5. CONTINUE ONTO US-17BUS N 3.2 MI.
6. TURN LEFT ONTO HENDERSON DR.

DESTINATION WILL BE ON THE RIGHT 2.2 MI.  
 2580 HENDERSON DR.,  
 JACKSONVILLE, NC 28546

SOURCE: GOOGLE EARTH PRO

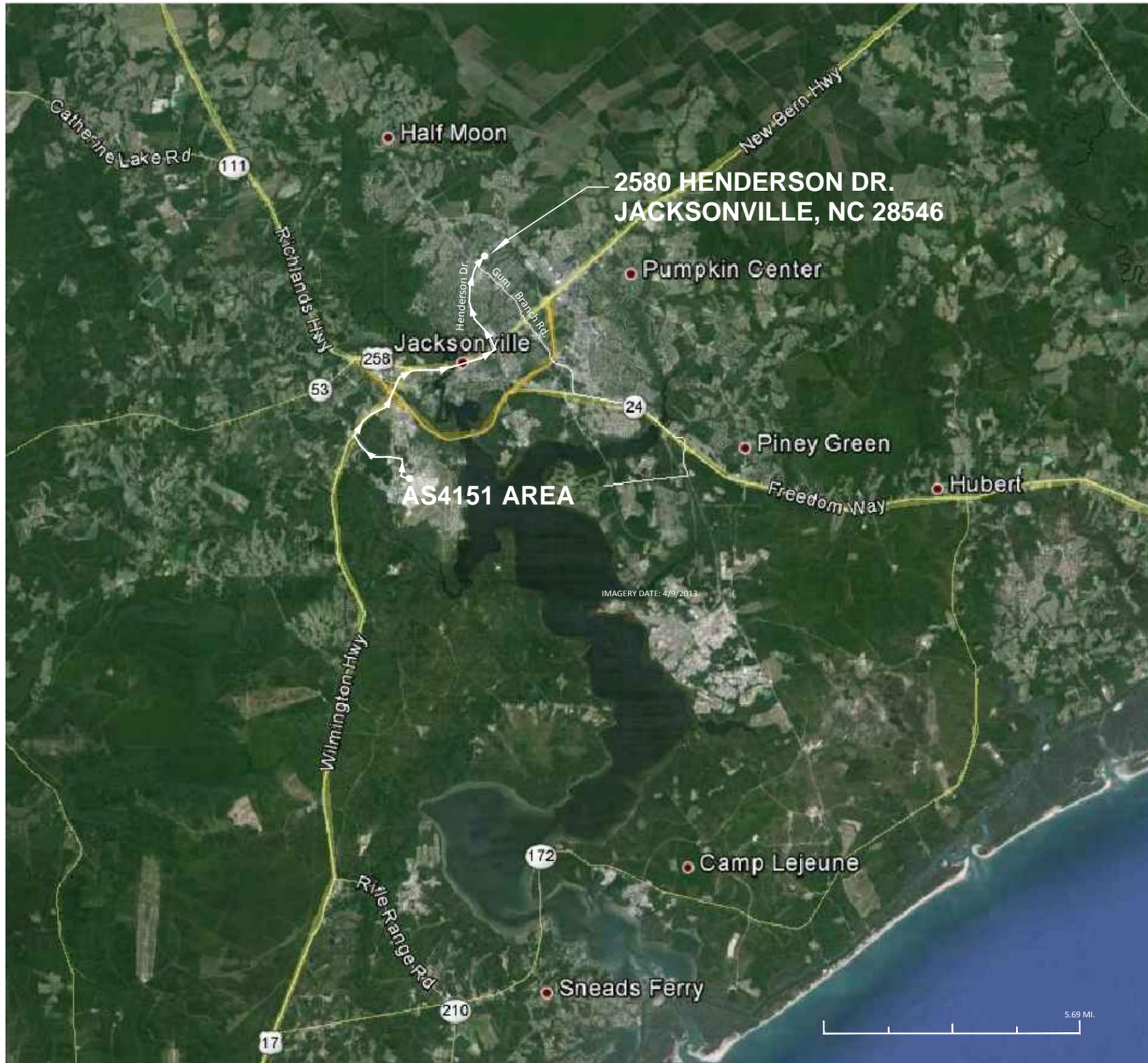
CAD FILE: WE21-FIGURE 9-6-G650.DWG



**MARINE CORPS INSTALLATIONS EAST - MARINE CORP BASE CAMP LEJEUNE  
 AST REMOVALS  
 SITE G650, CAMP GEIGER  
 HOSPITAL ROUTE MAP**

PREP	CHK	APPR	DATE

**FIGURE  
9-6**



DIRECTIONS:

1. HEAD WEST ON CAMPBELL ST. TOWARD DEMARCO ST. 0.7 MI.
2. TURN LEFT ONTO CURTIS RD. 1.1 MI.
3. TAKE FIRST RIGHT ONTO US-17 N 0.9 MI.
4. CONTINUE ONTO US-17BUS N 3.2 MI.
5. TURN LEFT ONTO HENDERSON DR.

DESTINATION WILL BE ON THE RIGHT 2.2 MI.  
 2580 HENDERSON DR.,  
 JACKSONVILLE, NC 28546

SOURCE: GOOGLE EARTH PRO

CAD FILE: WE21-FIGURE 9-7-AS4151.DWG

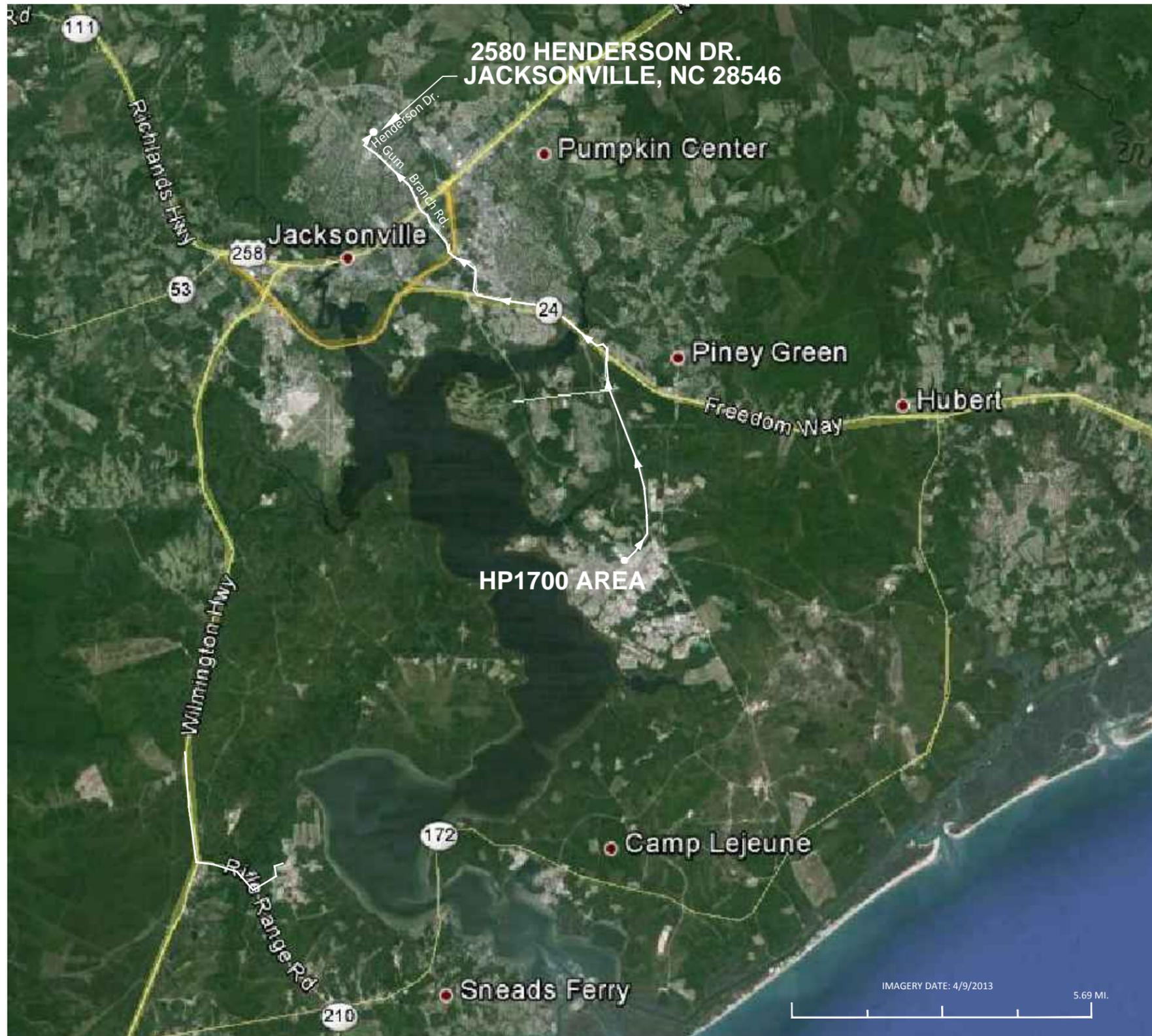


TETRA TECH EC, INC.

MARINE CORPS INSTALLATIONS EAST - MARINE CORP BASE CAMP LEJEUNE  
 UST REMOVALS AND AST INSTALLATIONS  
 SITE AS4151, MCAS NEW RIVER  
 HOSPITAL ROUTE MAP

PREP	CHK	APPR	DATE

FIGURE 9-7



**DIRECTIONS:**

1. HEAD NORTHEAST ON HOLCOMB BLVB. TOWARD FIR ST. 4.7 MI.
2. TAKE RAMP TO LEJEUNE BLVD. 2.6 MI.
3. TURN RIGHT ONTO BELL FORK RD. 2.1 MI.
4. CONTINUE ONTO GUM BRANCH RD. 1.6 MI.
5. TURN RIGHT ONTO HENDERSON DR. 0.3 MI.

DESTINATION WILL BE ON THE RIGHT 2.2 MI.  
 2580 HENDERSON DR.,  
 JACKSONVILLE, NC 28546

IMAGERY DATE: 4/9/2013  
 5.69 MI.

SOURCE: GOOGLE EARTH PRO

CAD FILE: WE21-FIGURE 9-8-HP1700.DWG



TETRA TECH EC, INC.

**MARINE CORPS INSTALLATIONS EAST - MARINE CORP BASE CAMP LEJEUNE  
 AST REMOVALS  
 SITE HP1700, MAIN SIDE  
 HOSPITAL ROUTE MAP**

PREP	CHK	APPR	DATE

**FIGURE  
 9-8**

**ATTACHMENT 1**  
**SITE SAFETY AND HEALTH 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. WE21**

**FINAL  
SITE SAFETY AND HEALTH PLAN**

**AST REMOVALS  
MARINE CORPS INSTALLATIONS EAST - MARINE CORPS BASE CAMP  
LEJEUNE  
JACKSONVILLE, NORTH CAROLINA**

**October 2014**

*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	10/6/14	C. Joblon	R. Margotto	All

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## TABLE OF CONTENTS

<b>1.0 INTRODUCTION.....</b>	<b>7</b>
1.1 Scope and Applicability .....	7
1.2 Site Description and Contamination Characterization.....	7
1.3 Protection of Site Workers and Environmental Safety and Health.....	8
1.4 Compliance Required.....	8
1.5 Applicable Standards, Regulations, and Guidance Documents .....	8
<b>2.0 HAZARD ANALYSIS AND RISK ANALYSIS.....</b>	<b>9</b>
2.3 Chemical Hazards .....	10
2.4 Physical Hazards .....	10
2.4.1 Fires, Explosions, and Hot Work.....	10
2.4.2 Noise .....	12
2.4.3 Heat and Cold Stress.....	12
2.4.4 Motor Vehicles and Heavy Equipment.....	12
2.4.5 Heavy Equipment Operation.....	13
2.4.6 Traffic .....	14
2.4.7 Electrical Hazards .....	14
2.4.7.1 Overhead Electrical Hazards.....	15
2.4.7.2 Underground Utilities.....	16
2.4.8 Slips, Trips, and Falls.....	16
2.4.9 Head and Back Injuries.....	16
2.4.10 Falling Objects .....	17
2.4.11 Heavy or Awkward Lifting.....	17
2.4.12 Portable Power Hand Tools .....	18
2.4.13 Excavation.....	19
2.4.14 Use of Pressure Washers.....	19
2.5 Biological Hazards .....	19
2.5.1 Insects .....	20
2.5.3 Lyme Disease.....	21
2.5.4 Poisonous Plants .....	22
2.5.5 Snakes .....	23
2.5.6 Bloodborne Pathogens .....	23
2.6 Action Levels and Methods for Mitigation.....	24
2.6.1 Implementation Of Engineering Controls And Work Practices .....	24
2.6.2 Work Stoppage and/or Emergency Evacuation of On-site Personnel .....	25
2.6.3 Prevention and/or Minimization of Public Exposures to Hazards Created by Site Activities .....	25
<b>3.0 STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES .....</b>	<b>25</b>
3.1 Primary Staff and Workers.....	<b>Error! Bookmark not defined.</b>
3.2 Visitors.....	<b>Error! Bookmark not defined.</b>

<b>4.0 TRAINING .....</b>	<b>25</b>
<b>5.0 PERSONAL PROTECTIVE EQUIPMENT .....</b>	<b>25</b>
<b>6.0 MEDICAL SURVEILLANCE.....</b>	<b>25</b>
6.1 Baseline Physical Examination Protocol .....	26
6.2 Medical Clearance.....	26
6.3 Record Keeping.....	26
<b>7.0 EXPOSURE MONITORING/AIR SAMPLING PROGRAM .....</b>	<b>26</b>
7.1 Air Monitoring – Worker Breathing Zones .....	27
7.2 Air Monitoring – Flammability/Combustibility.....	27
7.3 Air Monitoring – Tank Inerting .....	27
<b>8.0 HEAT AND COLD STRESS .....</b>	<b>28</b>
<b>9.0 STANDARD OPERATING PROCEDURES, ENGINEERING CONTROLS, AND WORK PRACTICES .....</b>	<b>28</b>
9.1 Site Rules/Prohibitions.....	28
9.2 Vehicle and Equipment Operations .....	29
9.3 Material Handling Procedures.....	30
9.3.1 General Information.....	30
9.3.2 Housekeeping.....	31
9.3.3 Fire Prevention.....	31
9.3.4 Personal Protective Equipment.....	32
9.3.5 Hand Tools.....	32
9.3.6 Power Tools .....	33
9.3.7 Manual Material Handling.....	33
9.3.8 Overhead Work.....	33
9.3.9 Electricity.....	34
9.3.10 Illumination.....	34
9.3.11 Ergonomic Considerations.....	34
<b>10.0 SITE CONTROL MEASURES .....</b>	<b>34</b>
10.4 On-Site Communications .....	35
10.5 Site Access Control .....	35
<b>11.0 PERSONAL HYGIENE AND DECONTAMINATION .....</b>	<b>35</b>
11.1 Responsibilities .....	35
11.2 Decontamination .....	35
11.3 Contamination Avoidance.....	36
11.4 Decontamination Guidance.....	36
<b>12.0 LOGS, REPORTS, AND RECORD KEEPING .....</b>	<b>36</b>

12.1 Recordkeeping Procedures .....37  
    12.1.1 Site Safety and Health Plan Change Approval Form.....37  
    12.1.2 Accident/Incident Reports .....37  
    12.1.3 Health and Safety Field Logbooks or Daily Safety Reports.....37  
    12.1.4 Material Safety Data Sheets.....38  
    12.1.5 Safety Checklists.....38  
12.2 Personal Exposure and Medical Monitoring Records.....38  
12.3 On-Site Logs .....38  
  
**13.0 UNFORESEEN HAZARDS .....38**  
  
**14.0 REFERENCES .....39**

**LIST OF TABLES**

Table 10.1           Emergency Hand Signals

**LIST OF APPENDICES**

Appendix A           Inspection Forms  
Appendix B           Calibration Form

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## ACRONYMS AND ABBREVIATIONS

°C	Degrees Celsius
°F	Degrees Fahrenheit
µg/kg	micrograms per kilogram
AHA	Activity Hazard Analysis
ANSI	American National Standards Institute
APP	Accident Prevention Plan
AST	Above Ground Storage Tank
CFR	<i>Code of Federal Regulations</i>
CMC	Corporate Medical Consultant
CPR	Cardiopulmonary Resuscitation
dBA	Decibels, A-Scale
EC	Emergency Coordinator
EHS	Environmental Health and Safety
EM	Engineer Manual
EZ	Exclusion Zone
GFCI	Ground Fault Circuit Interrupter
HAZWOPER	Hazardous Waste Operations and Emergency Response
HTRW	Hazardous, Toxic, and Radioactive Waste
kg	kilogram
LEL	Lower Explosive Limit
MCASNR	Marine Corps Air Station, New River
MCCS	Marine Corps Community Services
MCIEAST-MCB CAMLEJ	Marine Corps Installations East-Marine Corps Base Camp Lejeune
mph	miles per hour
MSDS	Material Safety Data Sheet
NCDENR	North Carolina Department of Environment and Natural Resources
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEC	National Electrical Code
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
PID	photoionization detector
PM	Project Manager
PPE	Personal Protective Equipment
RPM	Remedial Project Manager
SHM	Safety and Health Manager
SPCC	Federal Spill Prevention and Contingency Control Plan
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SZ	Support Zone

TtEC	Tetra Tech EC, Inc.
TWA	Time-weighted Average
UL	Underwriters Laboratory
USACE	U. S. Army Corps of Engineers
UST	Underground Storage Tank
WBGT	Wet Bulb Globe Thermometer
WNV	West Nile Virus

## **1.0 INTRODUCTION**

### **1.1 Scope and Applicability**

This Site Safety and Health Plan (SSHP) establishes policies and procedures to protect workers and the public from the potential hazards posed during field operations during the above ground storage tank (AST) removals at various sites on Marine Corps Installations East-Marine Corps Base Camp Lejeune (MCIEAST-MCB CAMLEJ), in Jacksonville, North Carolina. The elements of this plan comply with the informational requirements of the following regulations and guidance:

- Occupational Safety and Health Administration (OSHA)
  - 29 Code of Federal Regulations (CFR) 1910.120 [b][1]
  - 29 CFR 1926.65[b][4][ii]
- U.S. Army Corps of Engineers (USACE)
  - Safety and Occupational Health Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) Activities, Engineer Regulation (ER) 385-1-92 (2007a)
  - USACE Safety and Health Requirements Manual, Engineer Manual (EM) 385-1-1, Section 28B (Sep 2008 consolidated August 2011)
- Title 13 North Carolina Administrative Code

This SSHP is an attachment to the Accident Prevention Plan (APP) and has been structured as a companion document to be used in conjunction with the APP. Information and guidance already contained in the APP will be referenced in this document and will not necessarily be repeated.

### **1.2 Site Description and Contamination Characterization**

The various AST sites are located at Marine Corps Installations East (MCIEAST) Marine Corps Base (MCB) Camp Lejeune (CAMLEJ) and Marine Corps Air Station (MCAS) New River complex. The Base is a 156,000-acre facility located in Onslow County, North Carolina, adjacent to the southern side of the City of Jacksonville. The mission of the camp is to maintain combat ready units for expeditionary deployment. The Base provides housing, training facilities, and logistical support for Fleet Marine Force Units and other assigned units. TtEC has been contracted by the Navy to remove 7 ASTs.

Numerous fuel/product storage tanks are in operation aboard the MCB and MCAS complex. The tanks are subject to various State and Federal environmental regulatory requirements and may also require certain specific permits. Recently a steam plant operated by MCB (Building AS-4151), including four ASTs, was taken out of service. There is no plan to reuse the ASTs associated with the steam plant. Various other ASTs at the installation have reached their service life and are no longer needed. These tanks, as well as their associated piping systems, shall be removed per all applicable federal and state regulatory requirements. These actions will be performed in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), the North Carolina Department of Environment and Natural Resources (NCDENR)

non-underground storage tank (UST) regulations, the MCIEAST-MCBCAMLEJ Tank Management Plan, and the Federal Spill Prevention, Control, and Countermeasure (SPCC) requirements found in the Code of Federal Regulations (CRF), title 40, Section 112.

Based on available documentation, no known environmental contamination has occurred as a result of fuel/product storage at these locations. However, there is a potential for contaminated soil and/or groundwater.

### **1.3 Protection of Site Workers and Environmental Safety and Health**

The purpose of this SSHP is to ensure safe and healthful working conditions at the site. The safety and health organization and procedures contained in this SSHP have been established based on an analysis of the potential hazards, and personnel protection measures have been chosen based on these risks. Material Safety Data Sheets (MSDS) and a Hazardous Material Inventory List will be maintained on site for the hazardous materials needed to conduct the tasks outlined in the Scope of Work and the MSDSs are included in Appendix F of the APP. These include substances such as gasoline, diesel fuel, or oil for operation of equipment and tools, and small quantities of oils or other lubricants (e.g., grease) for daily maintenance of tools and equipment.

Residual Tri-ACT 1820 (corrosion inhibitor) is present in the 1,000 gallon AST at site HP1700. The MSDS is included in Appendix F of the APP. The residual product and tank rinse water will be handled and disposed of as a hazardous waste.

### **1.4 Compliance Required**

Compliance with the APP and this SSHP is required by the Tetra Tech EC, Inc. (TtEC) employees, their subcontractors, and visitors who participate in the remedial action. Refusal or failure to comply with the APP/SSHP or violation of any safety procedures by field personnel and/or subcontractors may result in their immediate removal from the site, following consultation with the Safety and Health Manager (SHM) and the Project Manager (PM).

### **1.5 Applicable Standards, Regulations, and Guidance Documents**

Adherence to applicable portions of federal, local, and national consensus organization and to corporate health and safety standards, regulations, and guidance manuals is required during field activities. These include, but may not be limited to, the following:

- 29 CFR 1910, OSHA, General Industry
- 29 CFR 1926, OSHA, Construction Industry
- USACE Safety and Health Requirements Manual, EM 385-1-1 (Sep 2008 consolidated August 2011)
- Title 13 North Carolina Administrative Code

## **2.0 HAZARD ANALYSIS AND RISK ANALYSIS**

Chemical hazards, such as exposure to petroleum fuel/product or to Tri-act 1820 residual, and general construction hazards due to AST tank removal and building demolition are main concerns for site work. Exposure to contaminated soil is not anticipated. Qualified and experienced site workers and operators will perform project work. Fire and explosion hazards could also occur through improper refueling activities, cutting and welding activities, operation of gasoline- or diesel-powered equipment and tools. Other physical hazards include slips, trips, or falls, being struck by or caught between hazards (crushing or laceration/puncture injuries, head injuries), severe weather hazards, biological hazards, and heat or cold stress illnesses.

An Activity Hazard Analysis (AHA) has been developed for each planned activity and operation occurring in each major phase of work for the project. Each AHA identifies the sequence of work, specific hazards anticipated, and the control measures to be implemented to minimize or eliminate each hazard. The AHA is used to augment daily health and safety meetings and is intended to heighten on-the-job safety and hazard awareness. A pre-task briefing will be documented and may be combined with the daily tailgate safety meeting. AHAs are the focal point for safe conduct of work on a project. Since each task is described and evaluated, workers will be better prepared to perform work safely.

The Site Safety and Health Officer (SSHO) will discuss the risks and precautions associated with each task identified in the Work Plan and this APP/SSHP. Daily safety meetings are held at the start of each shift, prior to the day's activity. The purpose of the safety meeting is to discuss the potential chemical, physical, and environmental hazards that could be encountered during the work that will be performed, along with preventive safety measures and emergency procedures. Attendance is mandatory for the employees involved in the specific work identified by the AHA. During a work day, if there are any changes or new conditions to be addressed, the SSHO will update the AHA and ensure the workers review the amended AHA. Amended AHAs must be reviewed by the Safety and Health Manager (SHM). If a change must be implemented immediately, and the SHM cannot be contacted, the SSHO may implement the change, leave the SHM a voicemail notification, and forward a copy of the change to the SHM as soon as possible.

If there are changes required due to changing conditions or requirements, the SSHP may be modified by using the Field Change Request form and by obtaining the approval of the Project Manager (PM), the SSHO, and the SHM. The Contracting Officer will be notified to approve any changes to the SSHP or AHAs.

The SSHO will modify these AHAs as appropriate, add new AHAs for new tasks, and train the employees who perform the tasks on the appropriate AHA. The SSHO will forward any modified or new AHAs to the SHM for review and approval, and the SHM will forward them to the Contracting Officer for acceptance.

The AHAs for this project are located in Appendix A of the APP.

## 2.3 Chemical Hazards

The presence of hazardous vapors may exist in the ASTs and in soil generated during limited excavation. These vapors could potentially present inhalation and/or flammability hazards. To mitigate these risks, air monitoring will be performed, as needed, to identify the presence of hazardous atmosphere. Air monitoring will be conducted during the tank cleaning phase to ensure successful inerting during any hot work activities to ensure flammable vapors are not present, and as needed throughout work activities. In addition, excavation areas considered to be confined spaces will not be entered.

For tanks that contained ultra low sulfur diesel, tank cleaning activities may be performed using confined space entry techniques. No person shall enter a tank unless the proper confined space entry requirements are implemented. No entry of the AST at Site HP1700 will be conducted because the tank contained Tri-act 1820, and this is considered a hazardous substance/waste. Confined space entry requirements are detailed in the APP.

## 2.4 Physical Hazards

There are numerous physical hazards associated with the project which, if not identified and addressed, may present the potential for accidents and personal injury to the workforce as well as operational problems. To minimize physical hazards, TtEC has developed standard safety protocols that will be followed. Failure to follow safety protocols, or improper adherence to these policies, will result in discipline of the employee. Some health and safety guidelines and rules are described in this section and in Section 10 of this plan. TtEC personnel and subcontractors will follow these requirements as specified here. Supervisors will observe the general work practices of each worker and enforce safe procedures to minimize physical hazards. Hard hats, safety glasses, and safety boots are required in the construction areas of the work site, unless specifically exempted by the SHM or SSHO.

### 2.4.1 Fires, Explosions, and Hot Work

Hot work (e.g. welding, burning, and cutting) conducted on site shall comply with the following requirements:

- TtEC Environmental Health and Safety (EHS) Procedure 6-5 (provided in APP, Appendix C).
- Hot work permits shall be obtained from the base fire department.
- The SSHO shall establish areas approved for welding, cutting, and other hot work.
- The SSHO is responsible for authorizing welding, cutting, and other hot work in areas not specifically designed for such operations.
- All personnel shall be protected from welding radiation, flashes, sparks, molten metal, and slag.
- All welding, burning, and cutting equipment shall be inspected daily by the operator. Defective equipment shall be tagged and removed from service, replaced or repaired, and re-inspected before again being placed in service.

- All welders, cutters, and their supervisors shall be properly trained in the safe operation of their equipment, safe welding/cutting practices, and welding/cutting respiratory and fire protection.
- Cutting, welding or other hot work shall be permitted only in areas that are or have been made fire-safe.
- Cutting or welding shall NOT be permitted in the following situations:
  - In areas not authorized by the SSHO.
  - In the presence of explosive atmospheres (i.e. mixtures of flammable gases, vapors, liquids, or dusts with air) or explosive atmospheres that may develop inside uncleaned or improperly prepared pips, valves, tanks, or other containers that have previously contained such materials.
  - In any area where combustible gas indicator readings are at or in excess of 10 percent of the lower explosive limit (LEL).
  - On in-service storage or process vessels or lines that contain flammable or combustible liquids, gases, vapors, or solids.
- Before any welding, cutting, or other hot work is permitted, the area shall be inspected by the SSHO to verify that the following requirements have been met:
  - Cutting and welding equipment to be used shall be in safe operating condition and in good repair.
  - Where practical, all combustible material shall be relocated at least 50 feet away from the hot work site. Where relocation is impractical, combustibles shall be protected with flame-proof covers or otherwise shielded.
  - At a minimum, two fully charged and operable fire extinguishers appropriate for the type of possible fire (minimum 6-A: 60- B: C) shall be available at the work area.
  - A fire watch shall be required whenever hot work is performed in hazardous locations.
  - Combustible gas indicator readings shall be taken to verify the work area is free of combustible gases and vapors.
  - The work area is free of toxic contaminants at concentrations in excess of established PELs or all personnel who will work in the area have been provided respiratory protection and protective apparel appropriate for the degree of exposure.
  - When hot work is to be performed on piping, tanks, valves, or other vessels that contain or have contained flammable or combustible liquids, the vessel shall be properly isolated, purged, cleaned, or made inert as appropriate to reduce the concentrations of flammable/combustible vapors to safe levels. (Note: As tanks surfaces are heated up by hot work they can release more vapors that become flammable. Therefore, good cleaning and scrubbing of tank is required, and the air in the tank will be tested for LEL continuously as the tank is cut.)
  - A hot work permit shall be completed by the SSHO, reviewed with personnel who will perform the hot work, and posted near the job site. An additional hot work permit may be required by base authorities.
  - If at any time during the hot work operation a change in conditions at the work site is suspected, such as a release of flammable gases or vapors in the work area, work shall be stopped immediately and the SSHO shall be notified. Such work stoppage

- invalidates the hot work permit, and a new permit shall be completed after inspections and tests have been performed by the SSHO.
- No erasures or changes of dates on hot work permits shall be permitted.

#### 2.4.2 Noise

Site activities will involve the use of heavy equipment and power tools that may exceed the occupational noise exposure limit action levels. Exposure to noise equal to or exceeding the OSHA 8-hour time-weighted average (TWA) sound level [85 decibels adjusted (dBA)] could result in hearing loss. To minimize this hazard, the SSHO will ensure the following measures are employed:

- Noise monitoring and worker education on hearing conservation principles
- Effective use of hearing protection by all personnel working near excessive occupational noise sources
- The use of engineering and/or administrative controls to reduce employee exposures to noise, where possible

Workers on site will be instructed to observe the “noise rule of thumb” on this project, described as follows:

*In general, if a worker must raise his/her voice to be heard by someone standing next to him/her (within 2 feet), noise levels may be exceeding 85 dBA and hearing protection will be required.*

Additional sound level monitoring may be conducted on site using a noise survey meter. Personnel with a standard threshold shift will be restricted from high noise exposure, or will be required to wear hearing protection.

#### 2.4.3 Heat and Cold Stress

Please refer to Section 9.14 of the APP.

#### 2.4.4 Motor Vehicles and Heavy Equipment

The project will use heavy equipment including trackhoe and/or backhoe and haul trucks. 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 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.
- 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) will be observed.
- The designated haul routes will be communicated with all vehicle and haul truck operators.
- Personnel will be prohibited from placing themselves between operating equipment and immovable objects.
- Personnel will wear high-visibility vests (Class 2 or 3) 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.

Personal responsibility will be invoked as a safety precaution. 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.

#### 2.4.5 Heavy Equipment Operation

Heavy equipment 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 A.
- 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 SSHO. The SSHO will be responsible for ensuring that these requirements are implemented on site.

#### 2.4.6 Traffic

TtEC personnel will follow local traffic rules. Base operations may be ongoing simultaneously with TtEC activities in some areas, including traffic on roadways in and out of the Base. Coordination with Base personnel will be done as required to ensure traffic safety and the delineation of controlled work zones. Site vehicles and haul trucks will yield to pedestrians, if present. Personnel working in areas subject to vehicular traffic (streets, parking lots, and so forth) will wear high-visibility safety vests. Flashing light or reflectorized barricades will be used for roads that are temporarily blocked due to equipment use. Fences and barricades will be used to delineate controlled work zones when necessary to keep unauthorized personnel out of the work area and to secure the area during not work hours. The Traffic Plans in the APP contain more details.

#### 2.4.7 Electrical Hazards

In order to prevent accidents caused by electric shock, the SSHO will inspect any electrical connections on a daily basis. The 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 (US), and Factory Mutual.
- 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.)
- Transformer banks and high-voltage equipment will be protected from unauthorized access.

- A qualified electrician will perform the work on electrical power supplies and lines. All live electrical work must comply with EM 385-1-1, Section 11.A.02 (c) which states “Energized work may never be performed without prior authorization. If it is determined that equipment must be worked in an energized condition, an energized work permit shall be submitted to GDA for acceptance.” Permits must be prepared in advance and prepared as specified in this section.
- 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.)
- 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 30-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. A 36-inch clearance is required for higher voltages. TtEC requires a 36-inch clearance of the breaker boxes, and so forth.
- Circuit breaker boxes that are locked, or kept in locked rooms, must have a key readily available in the event of an emergency.
- If any live electrical work will be done, it must include sufficient arc flash protection.

Portable generators, if used, must meet the requirements for grounding as specified in the NEC National Fire Protection Association 70. NEC 250-6 has certain exemptions for the grounding of portable and vehicle-mounted generators. Refer to USACE code 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.

#### *2.4.7.1 Overhead Electrical Hazards*

Overhead power lines may present a hazard to equipment and personnel. 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. A survey of the work area, including haul routes, laydown and staging areas will be conducted prior to mobilization to identify potential overhead hazards and ascertain their voltage, and this information will be communicated to subcontractors. No equipment will be moved with raised booms in areas where

overhead electrical lines are present.

#### *2.4.7.2 Underground Utilities*

A high-loss-potential hazard includes potential for contact with underground utilities in areas where ground penetrating activities are allowed (e.g., silt fence placement, excavation areas, etc). 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 ground-penetrating activities and precautions will include: white-lining the area of excavation; having utilities located using a private locating service; and performing a geophysical survey to clear utilities in the area where these activities will be performed. Ensure that any as-built drawings are also reviewed.

#### 2.4.8 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
- Open excavations
- Workplace clutter
- Wet or slippery surfaces (e.g. wet concrete)

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. 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 in laydown areas
- Maintaining good housekeeping practices
- Using barricades, high visibility fencing, or other appropriate warnings to demarcate hazard areas
- Proper selection and use of portable ladders.

The 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 M – Fall Protection, and Subpart X –Stairways and Ladders. Requisite strength, heights and widths, and fall protection will be evaluated as required for the work tasks.

#### 2.4.9 Head and Back Injuries

At a minimum, workers will don hard hats if they have an overhead hazard or heavy equipment; safety boots; and safety glasses prior to performing any site construction or investigation

activities. This will prevent minor injuries caused by bumping one's head while working around and under equipment and vegetation. Personnel are instructed in proper lifting techniques and will not lift heavy items without assistance. Each worker will not lift more than 50 pounds. Objects heavier than 50 pounds, and those with uneven weight distribution, may require assistance from another person. Supervisors will use mechanical lifting equipment whenever possible to minimize worker exposure to lifting hazards.

#### 2.4.10 Falling Objects

No personnel will work under equipment or suspended loads at any time. Hoisting and rigging tasks will be performed as outlined in the APP and a specific AHA has been developed for this task. Also, the supervisor will verify that a sufficiently wide area is clear of personnel while the equipment is in operation.

#### 2.4.11 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; slightly bend your knees and avoid turning and twisting 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.

#### 2.4.12 Portable Power Hand Tools

Any portable power tools (e.g., drills, reciprocating saws, 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. All electrical equipment must be listed by a Nationally Recognized Testing Laboratory (NRTL) as required by Subpart S of 29 CFR 1910 and Section 11.A.a. EM 385 - 1-1

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 nationally recognized laboratory 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 (See Appendix A) and colored stickers and/or tape, as previously described, to indicate that equipment has been inspected and is ready for use.

#### 2.4.13 Excavation

- Refer to APP Section 9.25.

#### 2.4.14 Use of Pressure Washers

All personnel using pressure washers shall wear Level D modified PPE at a minimum, which is consistent with the contamination being removed. Additionally, eye, face, and shin/metatarsal protection is mandatory. The pressure washer shall be inspected before each use. The manufacturer’s instruction manual shall be used to guide the inspection process.

Personnel shall be trained in the use of the washing equipment. All personnel working in the equipment decontamination area shall be trained in the emergency shut-off procedures for the equipment being used. The minimum amount of pressure that will complete the job should be used. Pressure washers exceeding 3,000 pounds per square inch shall not be used without the approval of the SHM.

The spray from such equipment shall only be directed at surfaces to be cleaned and never at body parts or other personnel because high pressure water can cause injury. Personnel working in the immediate area shall also use eye, face, and shin/metatarsal protection.

Personnel shall keep a firm grip on the wand and not point it to anything that is not being washed. Pressure washer operators must maintain good footing. The trigger on the wand shall never be wired/fixed open. Operators are to take adequate breaks to avoid fatigue. Pressure washing equipment shall be shut off and allowed to cool prior to re-fueling. Refer to AHA 3 for additional information.

## **2.5 Biological Hazards**

Biological hazards may be encountered on site. Workers should anticipate the likelihood of

encountering these hazards when in undeveloped outdoor areas. 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 SSHO will identify personnel with a known reaction to bites and stings at the pre-job safety orientation meeting.

Personnel will not attempt to capture or feed any wild or semi-wild animals due to the possibility of a bite or parasitic infestation. Additionally:

- 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.

### 2.5.1 Insects

Insects, including bees, wasps, hornets, spiders, 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 SSHO. Field personnel who may have insect allergies will provide this information to the SSHO prior to commencing work, and will have allergy medication on site. The following is a list of preventive measures:

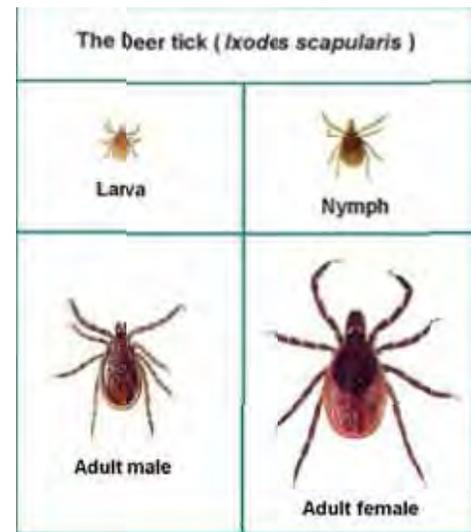
- Apply insect repellent prior to fieldwork and as often as needed throughout the work shift. Apply DEET (vapor-active repellent) to any exposed skin surface (except eyes and lips), and apply the permethrin repellent spray to field clothing. Note: Allow the permethrin to dry before using the treated clothing.
- Wear proper protective clothing (work boots, socks and pants).
- When walking in vegetated areas, avoid contact with bushes, tall grass, or brush as much as possible.

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.

### 2.5.3 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 includes:

- 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 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 SSHO immediately. Additionally, employees finding engorged ticks on their body will be given a medical examination.

#### 2.5.4 Poisonous Plants

Poison ivy, oak, or sumac may be present in North Carolina. The potential for contact with poisonous plants (i.e., poison ivy, poison oak, and poison sumac) exists when performing fieldwork in and vegetated areas, especially during vegetation removal tasks. 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 red or yellow foliage in the fall of the year. Poison sumac can be present in the form of a flat-topped shrub or tree. It has fern-like leaves, which are velvety dark green on top and pale underneath. The branches of immature trees have a velvety “down.” Poison sumac has white, hairy berry clusters.

Contact with poison ivy 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, 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. Wash affected skin with Technu or Zanfel as soon as possible after exposure. Use calamine or other poison ivy lotion if the rash is mild and to reduce itching. 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 or Zanfel 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.

### 2.5.5 Snakes

Six species of snakes in North Carolina are known to be venomous. Five of the six venomous snakes are pit vipers such as the Copperhead, Cottonmouth, and three species of rattlesnake. The sixth venomous snake is the Eastern Coral snake. 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. Use a stick to flush vegetation prior to walking in it and wear snake chaps (Gaiters). 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 SSOH 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® for medical follow up and recommendation to prevent infection.

### 2.5.6 Bloodborne Pathogens

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.
- 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 SSHO should be notified of any potential contact with blood or bodily fluids resulting from first aid or CPR administered on the job. Site personnel will be given bloodborne pathogens training.

## **2.6 Action Levels and Methods for Mitigation**

### **2.6.1 Implementation Of Engineering Controls And Work Practices**

TtEC will create systems and procedures to prevent and control hazards identified through the risk analysis. The hierarchy of controls is engineering, administrative, work practice, and PPE. Whenever feasible, engineering, administrative, or work practice controls will be instituted even if they do not eliminate the hazard or reduce exposure. Use of such controls in conjunction with PPE will help reduce the hazard or exposure to the lowest practical level. Where no standard exists, creative problem-solving will be used to create effective controls. 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

### 2.6.2 Work Stoppage and/or Emergency Evacuation of On-site Personnel

All employees and subcontractor personnel are empowered, authorized, and responsible to stop work at any time when an imminent and uncontrolled safety or health hazard is perceived. An employee's failure to adhere to the requirements of the APP or this SSHP, the Project Specific Work, or to observe specified safety requirements and restrictions or to properly use identified protective equipment may lead to injury or illness. As a result, 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 will be communicated to employees through meetings, postings, written communications, and reporting of hazards.

### 2.6.3 Prevention and/or Minimization of Public Exposures to Hazards Created by Site Activities

Because activities will take place at a military facility that is restricted to the public, the first line of security will involve using fences, temporary barriers and signs, site work permits, and any existing or additional physical barriers at the sites to restrict unauthorized TtEC as well as other personnel from entering a controlled work area. Signage will be posted instructing workers to contact the Site Superintendent for access.

## **3.0 STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES**

Refer to APP Section 4.0.

## **4.0 TRAINING**

Refer to Section 6.0 of the APP.

## **5.0 PERSONAL PROTECTIVE EQUIPMENT**

Refer to Section 9.6 of the APP.

## **6.0 MEDICAL SURVEILLANCE**

TtEC requires that site workers participate in a medical surveillance program that meets the requirements of 29 CFR, Part 1910.120(f) for work within an EZ where they could become exposed to a site contaminant. 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 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 copy of the certification of participation in the medical surveillance program shall be maintained in the project files by the SSHO. The certification must include the employee's name, date of last examination, and the name of the examining physician(s).

### **6.1 Baseline Physical Examination Protocol**

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.

### **6.2 Medical Clearance**

The workers who meet the criteria listed above must provide the 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 will also be 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. There are no additional specific medical surveillance requirements for this project.

### **6.3 Record Keeping**

The SSHO will maintain a file for each person on site. This file will have a copy of the physician's statement of employee's fitness for duty, the employee's ability to wear a respirator, and work restrictions, if any. The SSHO will confirm the employee and project supervisors comply with medical work restrictions, if any. The SSHO will also ask each employee to complete a form to indicate known allergies, prescription medications, and other medical information that will allow the Emergency Coordinator to respond to a medical emergency in an appropriate manner. Personnel will notify the SSHO regarding medications, including over-the-counter, they are using on each day of work. The SSHO, in consultation with the SHM and/or a medical consultant, will determine if these medications would affect a worker in a manner that would impair the ability of the worker to perform work safely. At no time will the SSHO maintain the copy of any actual medical records. These records are maintained by the TtEC medical consultant, WorkCare.

## **7.0 EXPOSURE MONITORING/AIR SAMPLING PROGRAM**

Tanks and associated piping contained fuel, or in the case of AST 1700-OSP, hazardous substance Tri-act 1820, and therefore, may present an inhalation or skin/eye contact hazard to

employees involved in associated tank activities. In addition, the presence of flammable vapors may present a fire hazard during activities which require the use of sparking equipment (e.g. cutting and welding activities). A properly calibrated MultiRAE® or other (photoionization detector) PID equipped with a 10.6 electron volt lamp as approved by the SHM will be used to screen for volatile organic compounds in worker breathing zones. In addition, the MultiRAE® will be equipped with a sensor to ensure lower explosive limit (LEL) is below 10 percent to ensure non-flammable atmospheres during cutting and welding activities. Air monitoring will be conducted to check worker breathing zones for toxic vapors, prior to any hot work permitting, and during tank inerting to ensure successful displacement of oxygen.

### **7.1 Air Monitoring – Worker Breathing Zones**

Ambient air measurements for volatile organic vapors will be collected in the breathing zone of site workers. Total organic vapor levels equal to or less than 10 parts per million (ppm) above background will be considered acceptable (sustained for 5 minutes or longer. No level above 100 ppm is acceptable without further investigation). Vapor levels in excess of this limit will result in the suspension of work until ambient vapor concentrations have dissipated to below 10 ppm. If work must continue in levels greater than 10 ppm, the SHM will evaluate the situation with the SSHO and recommend additional exposure control strategies, such as having site personnel wear a full-face air purifying respirator equipped with organic vapor and P-100 (high-efficiency particulate air (HEPA)) cartridges.

If respiratory protection is required (not anticipated), the APP will be updated to include respiratory protection requirements.

For this project, it is currently anticipated that dusts can be controlled, as needed, through adequate misting/wetting of the soil with water spray during soil handling activities. This is expected to be sufficient to control dusts and keep respirable dust concentrations down. The SSHO will monitor the implementation of dust controls on this project.

### **7.2 Air Monitoring – Flammability/Combustibility**

Air monitoring will be conducted using an LEL meter to determine flammability/combustibility of vapors present in the area proposed for hot work. Hot work will not be permitted in the presence of atmospheres with 10% or greater LEL. Refer to Section 2.4.1 for additional information.

### **7.3 Air Monitoring – Tank Inerting**

Prior to demolition/removal of ASTs, the tanks will be inerted using an acceptable method (e.g. nitrogen) to displace the oxygen present in the tank, and thereby eliminating a potential fire hazard. The AST interior (near the top of the tank interior) will be checked using an LEL meter calibrated to hexane to determine whether the tank has been successfully inerted. The tank will be considered to be inerted successfully when the LEL reading is 10% or less and when oxygen is at or below 12%.

## **8.0 HEAT AND COLD STRESS**

The procedures and practices for protecting workers from heat and cold stress are identified in Section 9.14 of the APP.

## **9.0 STANDARD OPERATING PROCEDURES, ENGINEERING CONTROLS, AND WORK PRACTICES**

### **9.1 Site Rules/Prohibitions**

The following practices are expressly forbidden during field operations:

- Entrance onto the site or into designated restricted area(s) without formal authorization, compliance with medical monitoring and training requirements, and/or compliance with this SSHP and the APP.
- Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth transfer and ingestion of material in any area designated a controlled work zone. Smoking is only allowed in specifically designated areas.
- Entry into areas or spaces where chemical hazards exist, without prior approval of the SSHO, appropriate engineering controls, and/or use of PPE.
- The wearing of facial hair which interferes with the satisfactory fit of the mask-to-face seal of respirators for personnel required to wear respiratory protection equipment. The use of respiratory equipment is not anticipated to be required for this project.
- The use/wearing of personal headphones. Their use may preclude reception of audible warning signals and/or hazard communication. Also, personal cell phones may not be used during work hours except when an employee is on break, unless the cell phone is being used for job-related purposes. Cell phones will not be used at any time that workers are driving or operating any equipment, or using any tools or mechanical devices.

The following practices are required:

- Personnel and equipment in the work area will be minimized, consistent with effective site operations.
- Equipment will be bonded and grounded, spark-proof and explosion-resistant, as appropriate, to minimize or prevent the ignition of flammable materials in the work zone.
- A minimum of two employees, in constant communication (either visual or voice) with each other, will be required to perform any work within the EZ.
- Telephone communications must be functional.
- Workers will work in sight of each other. If it is necessary for workers to work out of sight of each other, then the buddy system will be used and each team will have a means of communicating with one another (either each team has a telephone, or at least one team has a telephone and other teams can communicate by radio with the team that has the telephone).
- Each work team will be equipped with one 10B:C dry chemical fire extinguisher, an

emergency air horn (if vehicle horn is not available), first aid kit, and spill control materials.

- Smoking is not permitted in any work area, by any employee or subcontractor. Smoking areas may be designated specifically for use on breaks.
- Workers will park only in designated areas and are reminded to follow the Base and site-specific traffic rules and routes. In particular, workers are reminded to wear seat belts.
- Workers will wear high visibility reflective safety vests when working in the area so that they are readily visible to other workers and to vehicular traffic.
- Open excavations will not be left unprotected at the end of a work day. Excavations will be accompanied with high visibility fencing, barriers, or other signage to alert of the slip/trip/fall hazard.
- All underground utilities will be located and marked and geophysically verified before any ground intrusion.
- The work area must be clear of personnel other than authorized TtEC personnel and subcontractors.

## **9.2 Vehicle and Equipment Operations**

Prior to the use of the vehicles and equipment, operators will conduct a safety inspection and record the findings in the Safety Inspection Equipment Checklist (Appendix A). Dust suppressant (water misting) will be used for controlling airborne dust generation to the fullest extent possible without causing runoff or hazardous conditions. In addition, vehicular traffic speed on non-paved roads will be restricted to 15 mph (or less). Motor vehicles and material handling equipment assigned to these sites will conform to the requirements of 29 CFR, Parts 1926.601, and 1926.602. Crews using personnel transport vehicles to and from the worksites will use the vehicle's safety belts. Drivers of vehicles will be responsible for passenger use of the safety belts. Personnel are not allowed to ride in the bed of pickup trucks, unless there is an approved restraint system installed and used. The SSHO is responsible for maintaining a clean jobsite, free from hazards, and for providing safe access and egress from the site. Traffic cones and/or high-visibility barrier tape will be used, where appropriate, for traffic control into/out of restricted areas. Personnel will wear reflective, high-visibility safety vests or clothing whenever working in and around vehicles and on roads and jobsites. Other requirements include the following:

- Whenever the operator leaves the operator's position, the equipment will be turned off unless the equipment must be kept running to perform required maintenance or a safety inspection. (In this case, the operator will prevent the movement of the equipment by placing equipment in "park," by setting the emergency brake or another type of brake, or by placing blades or pans to the ground or any other manufacturer-recommended method to keep the vehicle from moving.)
- Blades and buckets on heavy equipment will be lowered during transport. Blades and buckets will be placed on the ground whenever the operator leaves the machine.
- Construction equipment (heavy equipment) has the right-of-way in field activities.
- Heavy equipment will have a reverse signal alarm (90 dBA) that operates automatically.
- The equipment will have brakes and brake lights. Equipment operated in hours of darkness

must have operating headlights.

- Personnel will not ride on, or be on, any equipment while it is in motion unless there is a seat or stand designed for a person to occupy that has restraints, such as approved seatbelts.
- Seatbelts and restraints will be used when any equipment is in motion.

### **9.3 Material Handling Procedures**

The following is a list of precautions to minimize the possibility of injury-related accidents from occurring during field operations.

#### 9.3.1 General Information

The following general health and safety work rules shall be followed by TtEC employees and subcontractors:

- Site personnel must attend each day's Daily Briefing.
- Any individual taking prescribed drugs shall inform the SSHO of the type of medication. The SSHO will review the matter with the SHM and the Corporate Medical Consultant (CMC), who will decide if the employee can safely work on site while taking the medication.
- The PPE specified by the SSHO and in the APP and SSHP shall be worn by site personnel in active work areas. This includes, but is not limited to, hard hats as required, safety toe boots, and safety glasses.
- Facial hair (beards, long sideburns or mustaches) which may interfere with a satisfactory fit of a respirator mask is not allowed on any person who may be required to wear a respirator.
- Personnel must sign the site log at the worksite.
- Personnel must follow proper decontamination procedures where required.
- Eating, drinking, chewing tobacco or gum, smoking, and any other practice that may increase the possibility of hand-to-mouth contact is prohibited in the work zone. (Exceptions may be permitted by the SHM to allow fluid intake during heat stress conditions.)
- Lighters, matches, cigarettes, and other forms of tobacco are prohibited in the work zone and in other placarded areas.
- Signs and demarcations shall be followed. Such signs and demarcation shall not be removed except as authorized by the SSHO.
- Site personnel must follow Hot Work Permits as issued if hot work is performed. No hot work is allowed when hazardous conditions are present.
- Site personnel must use the Buddy System during work activities.
- Site personnel must follow the work/rest regimens and other practices required by the heat stress program.
- Site personnel must follow lockout/tag-out procedures when working on equipment involving moving parts or hazardous energy sources.
- No person shall operate equipment unless trained and authorized.
- Fall protection or fall arrest systems must be in place when working at elevations greater than six feet for temporary working surfaces and four feet for fixed platforms.

- Safety harnesses and lanyards must be selected by the Competent Person. The user must inspect the equipment prior to use. No defective personal fall protection equipment shall be used. Personal fall protection that has been shock loaded must be discarded.
- Hand and portable power tools must be inspected prior to use. Defective tools and equipment shall not be used.
- Ground fault interrupters shall be used for cord and plug equipment used outdoors or in damp locations. Electrical cords shall be kept out of walkways and puddles unless protected and rated for the service.
- Improper use, mishandling, or tampering with health and safety equipment and samples is prohibited.
- Horseplay of any kind is prohibited.
- Possession or use of alcoholic beverages, controlled substances, or firearms on any site is forbidden.
- All incidents, no matter how minor, must be reported immediately to the SS and SSHO.
- Be your work partner's keeper. Consider the actions in terms of the hazard it may create for others.
- Consult with the SSHO if there is any doubt as to the safe way of performing a task or job.
- There will be no running at any time, except in extreme emergencies.
- Throwing any object at personnel or equipment is prohibited.
- Know and be familiar with emergency routes and procedures, and how to get to them. Do not block exits with material or equipment.

### 9.3.2 Housekeeping

- Clean work areas and storage areas encourage better incident prevention, and make the work easier to do.
- Dispose of trash and scrap in proper containers. This includes lunch papers, soft drink cans, banding straps, wood, rags, paper cups, etc.
- Keep tools, materials, and equipment stored in an orderly manner and in their proper places. This prevents unnecessary damage and helps to locate them when needed.
- Keep stored material, scrap, and other tripping hazards out of roads and walkways and away from emergency equipment. If it is in a walkway and it is not moving, it does not belong there.
- Cords, cables, and hoses crossing roads or walkways are to be covered to prevent tripping or damage, or are to be supported overhead, at least 7 feet above walkways and 14 feet above roads.

### 9.3.3 Fire Prevention

- Control "open flame" tools and equipment.
- Protect nearby combustible materials from heat, flames, sparks, and slag by moving or covering them.
- Keep flammables and combustibles in closed containers. Use safety cans.

- The site workers will have training on the use of portable fire extinguishers.
- Fire extinguishers will be located at each work site (minimum 6A:80B:C), each vehicle (minimum 1:A:10B:C), and each refueling area (minimum 40B:C).

#### 9.3.4 Personal Protective Equipment

- Head – Hard hats are required on construction sites. They are also required at other locations where overhead hazards exist. Bump hats are not permitted.
- Eyes and Face – Spectacle-type safety glasses and face shield are required when hitting steel on steel, grinding, drilling, sawing, or vibrating concrete, etc., or when working near someone else who is creating flying particles.
- Boots – At a minimum, workers will wear steel-toe boots (not shoes). Boots must be at least up to the ankle, with steel shank and non-slip soles. Composite material that complies with the ASTM F2412 and ASTM F2413 (except during geophysical mapping operations) standard for protective foot wear can be used in lieu of steel-toe and steel shank. They must be constructed of leather or other chemically resistant material. Suede and cloth are not acceptable. Operators of electronic detection equipment are exempt from wearing steel toes boots.
- Safety Vests – For the protection of workers, and to make workers more visible, workers working near roads or other places where there is vehicular traffic must wear high-visibility vests as required by code. During hours of darkness, these vests must have reflective tape.
- Fall Protection – Safety harnesses and a fall restraint system, such as lanyards, attached to an approved support point are required when working from any support or surface where the possibility of falls exist, or where guardrails are not installed. Tie off to a solid, approved support. Tie off as short as possible, allowing no more than 36 inches for fall.
- Additional PPE will be used as specified based on the hazard assessment (e.g., chemical protective gloves).

#### 9.3.5 Hand Tools

- Every tool is designed for a specific use. Do not misuse. Inspect daily for defects.
- Keep tools in proper working condition - clean, sharp, oiled, dressed, and adjusted.
- Mushroomed chisel and drills cause dangerous flying objects. Keep them dressed.
- Never hit hardened steel with hardened steel, such as hitting a hatchet with a hammer.
- Do not use "cheaters" to increase capacity. Get a bigger sized tool.
- Carry tools in proper sheath, belt bag, or box, with their points aiming down.
- Do not carry pointed or sharp tools in any pockets.
- Eye protection is required for protection from flying particles.
- Do not use damaged tools. Mark them and tag them as out-of-service.

### 9.3.6 Power Tools

- Know how to shut a tool off before turning it on. No locked "on" switches on hand-held power tools.
- Eye protection is required for protection from flying particles.
- Power-activated tools will be inspected daily before use for proper operation of tool safety devices. Workers must be authorized by a foreman to operate this equipment.
- Power tools designed to accommodate guards will have guards installed and functioning prior to use.
- The power supply must be properly attached to the tool and to the source. Electric tools must be grounded (or "double insulated").
- Check the work area for other people before starting the power tool. Warn people nearby.
- Be prepared for jamming of rotating tools. Maintain good footing, good balance, and watch out for nearby obstructions. Check for loose clothing.
- Shut off and bleed down the air hose before disconnecting air tools. Never point an air hose toward another person or yourself.
- Power tools must be GFCI-protected or double-insulated.
- Avoid using power tools in wet locations (air-powered tools may be used).
- Protect cords and plugs from damage. Keep the power cord away from the operating portion of the power tool.
- Power tools must be turned off before disconnecting from the power source. If a circuit breaker is tripped or the tool stops operating, turn off the power switch before disconnecting the power source.
- Disconnect power cords from the source before coiling.
- Unplug electric cords.
- Store tools in a safe place when not in use. Protect from weather, dirt, and water.

### 9.3.7 Manual Material Handling

- Leg muscles are stronger than back muscles. Lift with the legs, and not the back. Bend knees, keep back straight, tighten abdomen and, using legs, make a smooth, controlled lift.
- Plan before lifting – consider weight, size, shape, path of travel, and set-down location. Get help if necessary. Workers shall not lift more than 50-pounds without assistance.
- Protect the hands and fingers from rough edges, sharp corners, and metal straps. Keep hands and fingers out of pinch points between the load and other objects.

### 9.3.8 Overhead Work

- No one is to be unprotected under overhead work.
- Workers will never work under any operating equipment or booms, whether loaded or unloaded.
- Erect barricades, signs, or other devices to warn people of the work overhead. Respect the barricades or signs put up by others.

- Covered walkways are needed where people must pass under overhead work.

### 9.3.9 Electricity

- Electrical work will be performed by qualified persons familiar with the NEC and other applicable codes.
- Temporary lighting circuits require guards over the bulbs. Metal guards must be grounded.
- Keep extension cords out of water and at least 7 feet above walkways.
- Disconnect switches must be labeled to show the equipment or service they feed. Check before operating.
- Always shut down electrical equipment before servicing, repairing, or investigating questionable function.

### 9.3.10 Illumination

Site work, when performed outdoors, is scheduled to be performed during daylight hours only (1/2 hour after sunrise to 1/2 hour before sunset). If work must be performed during hours of darkness or inside buildings, the project will provide additional lighting to meet the requirements of 29 CFR, Part 1910.120.

### 9.3.11 Ergonomic Considerations

Routine activities at the project may involve tasks that, by their nature, may subject personnel to unexpected ergonomic stresses. Examples of ergonomic stresses include:

- Muscular sprains and strains
- Musculoskeletal trauma from impacts or vibrations
- Fatigue due to extended work schedules

Caution and workload awareness should be exercised by site personnel during project activities. Tasks which involve manual manipulation of tools or materials, and/or prolonged exposure to vibrating mechanical equipment should be monitored by the individuals involved with them to preclude the adverse effects of ergonomic stress.

## **10.0 SITE CONTROL MEASURES**

The purpose of site control is to minimize chemical exposures to workers, protect the public from hazards due to site activities, and prevent vandalism. The work areas that pose physical hazards may be regarded as restricted areas and will be identified as appropriate. Appropriate warning signs shall be strategically placed to give adequate warning and caution of hazards, instructions, and directions to workers and non-project personnel. In addition, all equipment will be locked when project personnel are not present.

## 10.4 On-Site Communications

Site personnel and equipment will be working in close proximity to each other most, but not all of the time. In most instances, hand signals, voice commands (including handheld radio), and line of site will provide the initial means of communication. Cellular telephones may be required for individuals for work use, however these can be a distraction and not all workers will be authorized to carry them at the direction of the SS. All radios and/or cellular phones used for communication will undergo regular operational checks to verify they work correctly. Hand signals listed in Table 10.1 will be used by site personnel in emergency situations or when verbal communication is difficult. An air horn or vehicle horn will be available and used when necessary to indicate an emergency.

**Table 10.1 Emergency Hand Signals**

<b>Signal</b>	<b>Definition</b>
Hands on top of head	Need assistance
Thumbs up	Okay, I am all right, or I understand
Thumbs down	No or negative
Gripping partner's wrist	Exit area immediately

## 10.5 Site Access Control

All site workers will attend the daily briefing before proceeding to work areas. All visitors must check with the SSHO before entering the site to receive orientation, sign the visitors' log, and get escort (when required) to their work location. All personnel and visitors must have badges or other permission to come onto the Base.

## 11.0 PERSONAL HYGIENE AND DECONTAMINATION

This section provides decontamination procedures and guidelines for developing site- and activity-specific decontamination procedures. At the present time, there is no identified need for decontamination to address chemical contamination.

### 11.1 Responsibilities

The SSHO is responsible for establishing and maintaining appropriate equipment and personnel decontamination areas when required. The SSHO also ensures that adequate decontamination procedures are followed to prevent contamination of individuals or the environment.

### 11.2 Decontamination

Decontamination involves physically removing contaminants and/or converting them chemically into harmless substances. Decontamination, proper PPE-doffing procedures, and management of

controlled safety zones minimize the chance of cross-contamination from protective clothing to wearer, equipment to personnel, and one area to another.

In general, basic decontamination will consist of:

- Removing residual materials (e.g., soil, mud) regardless of their source before taking breaks or engaging in hand-to-mouth activities.
- Employing soap and water wash and rinse for hands and face. Hygiene wipes may also be used, but are not a substitute to clean water and soap.
- Keeping break areas clean. No dirty field equipment, dirty boots, or PPE will be permitted in these locations or offices.
- Proper doffing of used PPE and proper storage of reusable PPE between uses.

### **11.3 Contamination Avoidance**

Avoiding contamination is the first and best method for preventing the transfer of contamination to personnel or to non-contaminated 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 unnecessarily walk in muddy areas.
- Waste containers should be checked for incompatible materials.
- Use the proper tools to safely conduct the job.

### **11.4 Decontamination Guidance**

A hand washing station will be available for workers to wash their hands before leaving the work area or taking breaks. A boot wash will be available at break areas, as needed.

Equipment will follow established traffic patterns and exit the fenced area through the clean construction zone (geotextile and gravel lined pad). It is anticipated that heavy equipment, such as excavators or back hoes and portable hand tools such as shovels will be cleaned of adhering soil or mud along with any loose debris prior to tracking mud onto the roadways servicing the Base if required beyond. Roadways shall be cleared of any debris resulting from the on-site activity.

## **12.0 LOGS, REPORTS, AND RECORD KEEPING**

The following is a summary of required health and safety logs, reports, and recordkeeping for this project.

## **12.1 Recordkeeping Procedures**

### 12.1.1 Site Safety and Health Plan Change Approval Form

A Field Change Request Form is to be completed for the changes to the SSHP. This form requires the signatures of the SSHO and the SHM and the acceptance of the OICC. The form will be completed and submitted according to the proper QC document control procedures. A copy of the approved form will be maintained on site during the field activities and in the project files at TtEC's office thereafter.

### 12.1.2 Accident/Incident Reports

Please refer to Section 8.0 of the APP.

### 12.1.3 Health and Safety Field Logbooks or Daily Safety Reports

The SSHO will complete and maintain the daily log book at the site. Logbooks will be used to document important events as they occur and to document informal daily inspections and other information related to health and safety. Some general procedures will pertain to the use of the logbooks and the following information will be recorded on each page:

- Initials of persons making entry
- Page numbering
- Date
- Time of each entry (military time)
- Location
- Situation requiring entry into log book

The log will be signed at the end of each day or work shift and a diagonal line drawn to the bottom of the page from the last entry. The entries will be made in black ink. No pages will be removed from the logbook, and each page will be numbered. Any corrections will be made with a single line through the entry, and initialed.

The logbook will be used to record daily site conditions and activities. The logbook will contain the following items:

- Names and job titles of the personnel in the work group
- Level of protection
- Health and safety monitoring equipment used
- Calibration records (see Appendix B)
- Weather conditions
- Work/rest schedule (if appropriate)
- A description of the activities as they are occurring
- Any pertinent health and safety observations

- Exposure monitoring data (if appropriate)

Copies of the logbooks will be submitted to the SHM, as necessary. The original logbooks will become part of the exposure records file and will be maintained in the project files at TtEC's office thereafter.

In lieu of logbooks, a daily safety report, containing the same information as described above, may be used. This report must be submitted electronically each day to the SHM and will be attached to the project daily report.

#### 12.1.4 Material Safety Data Sheets

MSDS will be obtained and kept on file at the project site for each hazardous material brought to, used at, or stored at the site. An MSDS for each contaminant will also be maintained. The MSDS will be kept on file by the SSHO at the project site, and can be found in Appendix F of the APP.

#### 12.1.5 Safety Checklists

The health and safety checklists will be maintained on site during the field activities and in the project files at TtEC's office thereafter.

### **12.2 Personal Exposure and Medical Monitoring Records**

Medical and training records are normally kept by the employer. Proof of the most recent training and medical qualifications must be provided to the SSHO by the employee. The SSHO will keep a file at the site containing appropriate training and medical qualifications for site workers. Medical records will be maintained in accordance with 29 CFR, Part 1910.1020. The examining physician retains custody of the complete medical record; employee records have only the physician's statement of medical qualification for duty and the employee's fitness to wear a respirator. These records will be kept in the project files at TtEC's office thereafter. All records of any personal air sampling must be submitted to the SHM. The SHM will forward copies of personal air monitoring results to the employees' medical retained by WorkCare.

### **12.3 On-Site Logs**

A log of personnel who are on site each day (including job title, level of protection, and work location); visitor registration; training logs; and daily safety inspection logs will be kept on site by the SSHO or designee. Originals will be kept in the project file.

### **13.0 UNFORESEEN HAZARDS**

Should any unforeseen hazard become evident during the performance of work, the SSHO shall bring such hazard information (both verbally and in writing) to the attention of the SHM, the OICC, and the PM for resolution as soon as possible. In the interim, necessary action shall be taken to reestablish and maintain safe working conditions.

## 14.0 REFERENCES

- National Fire Protection Association 70 (NFPA 70), National Electrical Code (NEC). Code NEC 250-6.
- NAVFAC Mid-Atlantic. Scope of Work-Revised. Above Storage Tanks (ASTs), at. Marine Corps Base Camp Lejeune, NC. Prepared for Tetra Tech EC, Inc. May 28, 2014.
- Tetra Tech EC, Inc. Basis of Estimate and Proposal-Revised. RRP XE21 – Above Ground Storage Tank Removals at. Marine Corps Base Camp Lejeune, Jacksonville, NC. Prepared for Naval Facilities Engineering Command Mid-Atlantic. June 11, 2014.
- U.S. Army Corps of Engineers (USACE). 2004. Basic Safety Concepts and Considerations for Ordnance and Explosives Operations. Engineer Pamphlet (EP) 385-1-95a. August 2004.
- U.S. Army Corps of Engineers (USACE). 2007a. Safety and Occupational Health Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) Activities. Engineer Regulation (ER) 385-1-92. May 2007.
- U.S. Army Corps of Engineers (USACE). 2007b. Safety and Health Requirements of Munitions and Explosives of Concern (MEC) Operations. ER 385-1-95. March 2007.
- U.S. Army Corps of Engineers (USACE). 2008. Safety and Health Requirements. Engineer Manual (EM) 385-1-1. Sep 2008 consolidated August 2011.
- U.S. Department of Labor, Occupational Health and Safety Administration; 1910 – Occupational Safety and Health Standards, General Industry. 29 Code 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. 29 Code of Federal Regulations (CFR). Parts 1926.59, 1926.601, and 1926.602.
- North Carolina Administrative Code. “Title 13 – Labor.” N.p., n.d. Web. 21 October 2013 <<http://reports.oah.state.nc.us/ncac.asp?folderName=\Title 13 - Labor>>.

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**APPENDIX A**  
**INSPECTION FORMS**

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## Hand and Power Tool Inspection Checklist

Yes	No	NA	Requirement	Comments
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are all tools and equipment (both company and employee owned) used by employees at their workplace in good condition?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Any loose parts?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Missing pins and/or bolts?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are broken or fractured handles on hammers, axes and similar equipment replaced promptly?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are hand tools such as chisels and punches, which develop mushroomed heads during use, reconditioned or replaced as necessary?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are worn or bent wrenches replaced regularly?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are appropriate handles used on files and similar tools?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are employees made aware of the hazards caused by faulty or improperly used hand tools?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are jacks checked periodically to ensure they are in good operating condition?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are tool handles wedged tightly in the head of all tools?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are tool cutting edges kept sharp so the tool will move smoothly without binding or skipping?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are tools stored in dry, secure locations where they won't be tampered with?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are appropriate safety glasses, face shields, etc. used while using hand tools or equipment which might produce flying materials or be subject to breakage?	
Power Tool Inspection Checklist				
Yes	No	NA	Requirement	Comments
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are grinders, saws and similar equipment provided with appropriate safety guards?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are power tools used with the correct shield, guard, or attachment, recommended by the manufacturer?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are portable circular saws equipped with guards above and below the base shoe? Are circular saw guards checked to assure they are not wedged up, thus leaving the lower portion of the blade unguarded?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are rotating or moving parts of equipment guarded to prevent physical contact?	

## Hand and Power Tool Inspection Checklist

Yes	No	NA	Requirement	Comments
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are all cord-connected, electrically operated tools and equipment effectively grounded or of the approved double insulated type?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are effective guards in place over belts, pulleys, chains, sprockets, on equipment such as concrete mixers, and air compressors?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are portable fans provided with full guards or screens having openings ½ inch or less?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is hoisting equipment available and used for lifting heavy objects, and are hoist ratings and characteristics appropriate for the task?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are ground-fault circuit interrupters provided on all temporary electrical 15 and 20 ampere circuits, used during periods of construction?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are pneumatic and hydraulic hoses on power operated tools checked regularly for deterioration or damage?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Air compressor:	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	• Is the air compressor equipped with a Surge Check Valve?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	• Pressure regulator gauge and valve?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	• Pressure relief valve?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	• Water trap and filter?	
Chainsaws				
Yes	No	NA	Requirement	Comments
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the chain sharp, well oiled, and properly adjusted (chain tension)?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the bar straight?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are there indications of excessive wear?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the chain brake lever move freely?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does chain brake stop the chain when applied?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the chain move when idling?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are the cans used to fuel the chainsaw safety cans?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the on/off switch function properly?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the throttle lock function properly?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the chainsaw equipped with continuous pressure throttle control?	

## Hand and Power Tool Inspection Checklist

Yes	No	NA	Requirement	Comments
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PPE: Is the following PPE in serviceable condition? Hardhat with mesh visor and ear muffs?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Safety glasses? Chainsaw chaps?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Gloves with protection also on the back of the hands?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Emergency Equipment:	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is a fire extinguisher (3A:B:C) available for immediate use?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is a first aid kit immediately available for use? Does it contain the minimum content as required in the HASP?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Communication – Is an acceptable means of communication available (hand signals, radios, air horns, etc.) that will support communication over the engine noise? Type?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are MSDSs available for the fuels, fuel additives, and lubricating oils?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the operator trained in proper operation of the chainsaw? Does the operator demonstrate knowledgeable operation?	

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 <b>TETRA TECH EC, INC.</b>	<h2 style="margin: 0;">VEHICLE/HEAVY EQUIPMENT INSPECTION CHECKLIST</h2>	
Project: _____ Equipment No. _____ Manufacturer: _____ Engine _____ Hrs/Mileage _____	Equipment Type: _____ Model: _____ Date: _____ Team Number: _____	
<b>Equipment Checklist</b> (Check all that apply and provide description of corrections needed)		
	Condition Good	Correction Needed
Steering	_____	_____
Service Brakes	_____	_____
Emergency Brakes	_____	_____
Retarder	_____	_____
Transmission	_____	_____
Controls	_____	_____
Hydraulic Leaks	_____	_____
Exhaust System	_____	_____
Warning Gauges	_____	_____
Windshield	_____	_____
Lights	_____	_____
Mirrors	_____	_____
Seat and Seat Belts	_____	_____
Tires/Tread	_____	_____
Regular Horn	_____	_____
Back-up Alarm	_____	_____
Steps, Hand-holds	_____	_____
Fire Extinguisher	_____	_____
Rollover Cage	_____	_____
Other:	_____	_____
Other:	_____	_____
Remarks:	_____	_____
<b>Approvals</b>		
Operator's Signature):		Date:
Team Leader Signature:		Date:
Equipment Supervisor's Signature (Repairs or Adjustments Completed):		Date:

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**Page 1 of 1**

**DAILY EQUIPMENT INSPECTION**

EQUIP. NO. \_\_\_\_\_ TYPE \_\_\_\_\_  
 MANUFACTURER \_\_\_\_\_ MODEL \_\_\_\_\_  
 PROJECT \_\_\_\_\_ DATE \_\_\_\_\_  
 ENGINE HRS/MILEAGE \_\_\_\_\_ SHIFT \_\_\_\_\_

Check appropriate column and describe correction needed.

	<b>Condition Good</b>	<b>Correction Needed</b>
<b>Steering</b>	_____	_____
<b>Service Brakes</b>	_____	_____
<b>Emergency Brakes</b>	_____	_____
<b>Retarder</b>	_____	_____
<b>Transmission</b>	_____	_____
<b>Controls</b>	_____	_____
<b>Hydraulic Leaks</b>	_____	_____
<b>Exhaust System</b>	_____	_____
<b>Warning Gauges</b>	_____	_____
<b>Windshield</b>	_____	_____
<b>Lights</b>	_____	_____
<b>Mirrors</b>	_____	_____
<b>Seat and Seat</b>	_____	_____
<b>Tires/Tread</b>	_____	_____
<b>Regular Horn</b>	_____	_____
<b>Back-up Alarm</b>	_____	_____
<b>Steps, Hand-holds</b>	_____	_____
<b>Fire Extinguisher</b>	_____	_____
<b>Rollover Cage</b>	_____	_____
<b>Other</b>	_____	_____

**Remarks:** \_\_\_\_\_

\_\_\_\_\_

Signed \_\_\_\_\_  
 Operator

Repairs or adjustments completed:

Date: \_\_\_\_\_

Signed \_\_\_\_\_  
 Equipment Supervisor/Mechanic

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**APPENDIX B**  
**CALIBRATION FORM**

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**APPENDIX A**  
**ACTIVITY HAZARD ANALYSES**

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# Activity Hazard Analysis (AHA) #1

<b>Activity/Work Task: Mobilization and Site Setup</b>	<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>	<b>M</b>				
Project Location: Various AST Sites, Camp Lejeune Marine Corps Base , Jacksonville, NC	<b>Risk Assessment Code (RAC) Matrix</b>					
Contract Number: N62470-13-D-8007	<b>Severity</b>	<b>Probability</b>				
Date Prepared: August 2014		Frequent    Likely    Occasional    Seldom    Unlikely				
Prepared by: Christine Joblon, Senior Scientist	Catastrophic	<b>E</b>	<b>E</b>	<b>H</b>	<b>H</b>	<b>M</b>
	Critical	<b>E</b>	<b>H</b>	<b>H</b>	<b>M</b>	<b>L</b>
Reviewed by: Roger Margotto, CIH, CSP, CHMM, Program SHM	Marginal	<b>H</b>	<b>M</b>	<b>M</b>	<b>L</b>	<b>L</b>
	Negligible	<b>M</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>
<p><b>Notes:</b> (Field Notes, Review Comments, etc.)</p> <p>In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.</p> <p style="color: red;">Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated, High visibility safety vest.</p>	Step 1: Review each “ <b>Hazard</b> ” with identified safety “ <b>Controls</b> ” and determine RAC (see above).					
	“ <b>Probability</b> ” is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.				<b>RAC Chart</b>	
	“ <b>Severity</b> ” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.				<b>E = Extremely High Risk</b>	
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on the AHA. Annotate the overall highest RAC at the top of the AHA.				<b>H = High Risk</b>	
				<b>M = Moderate Risk</b>		
				<b>L = Low Risk</b>		

<b>AHA #1 – Activity/Work Task: Mobilization and Site Setup</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
Arrival at Location	Lack of Emergency Preparedness and Health and Safety (General) before beginning work	Get to know the location if not familiar. SSHO to locate the emergency hospital and ensure routes are correct as shown in Figure 9-2. Coordinate with OICC and Base personnel as required. Conduct site orientation with the folks involved in mobilization tasking including establishment of laydown areas, unpacking and unloading and staging of materials, review of the APP and this AHA, and the Emergency Response Plan and document the training. Ensure communications are established and working properly among team members. Develop a plan for mobilization organization and tasking and emphasize communication. Ensure emergency and basic safety equipment and PPE is located and available for use prior to starting site work. Use buddy system. SSHO will have site workers fill out medical data sheets that are included in an appendix to the APP.	M
Site Setup (Unloading and initial staging of materials and equipment)  (general site hazards)	Vehicle operations from Tt, subcontractor, or other tenant operations and delivery vendors could cause injury to personnel or others onsite	Workers operating company or subcontractor vehicles will have a valid state issued driver’s license. Any Commercial Driver’s License (CDL) truck and trailers will be operated by CDL qualified drivers. All personnel and trucks will have Base badges following Base procedures. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt while seated. Use parking brake when parked. Use chocks when parked on inclines. Use dedicated spotter and standard hand signals for backing operations. Wear high visibility vest when working around operating vehicle traffic. Coordinate with other site tenants as required to identify travel and traffic patterns and to delineate work areas. Follow designated traffic routes, as indicated in the traffic plan.	M
	Construction equipment could cause injury to personnel	Workers operating construction equipment will be qualified and designated operators. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt while seated. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed.	M
	Hoisting and Rigging for unloading of materials or equipment (if used during this AHA)	Refer to AHA 8 – Hoisting and Rigging, which will be followed in addition to this AHA.	M
	Ergonomic hazards such as sprains, strains, or back injury from lifting or repetitive actions	Use mechanical lifting equipment or team lift when possible rather than by hand and tool methods. Do not bend at the waist, bend at the knees. Do not twist at the waist nor turn while lifting. Keep the load centered and close to body. Do not lift more than 50 pounds (may be lesser for some folks) alone. Rotate tasks and take breaks when performing repetitive tasks and try to find the best position possible to perform the task.	M

<b>AHA #1 – Activity/Work Task: Mobilization and Site Setup</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
Site Setup (Unloading and initial staging of materials and equipment)  (general site hazards) (continued)	Slips, trips, and falls could lead to injuries	Keep work areas free of debris and equipment in work paths. Follow good housekeeping in work areas. Correct hazards when seen, such as holes or other trip hazards. If they cannot be removed, they must be marked.	M
	Handling sharp objects or using hand tools could cause cuts, punctures, or scrapes	Wear leather work gloves when handling materials that may be sharp or have sharp edges. Be familiar with the proper use and limitations of hand tools. Report even minor injuries to your supervisor for evaluation. Have a first aid kit available and have a minimum of 2 persons with first aid and CPR training onsite.	M
	Use of construction equipment could strike overhead power lines	The travel path, staging, and other locations where mobile equipment with booms will be operated will be evaluated for potential overhead lines. The SSHO will establish the required clearance distances that are required and areas to be avoided will be marked and communicated or isolated through coordination with the local utility provider. The voltage of lines, if present, must be known.	M
	Cold or heat stress and weather hazards	Properly dress for the weather. SSHO to monitor weather and implement heat stress and cold stress controls as specified in the APP. Provide breaks for personnel to get either into cool or warm environment. Encourage a steady work pace. Ensure adequate drinking water is available. Know the signs and symptoms of exposure and keep an eye on your partner. SSHO to implement EHS 4-6, Temperature Extremes.	M
	Eye injuries from dust or debris or struck by	Wear safety glasses with side shields at all times when working. If something enters the eye, do not rub. Set up portable eyewash for flushing of eye to try to remove object. Notify supervisor so eye can be monitored. If object still irritates or stays in the eye, seek medical attention as soon as possible. Follow up with eye exam is recommended any time an object gets into an eye since it is necessary to ensure object does not remain, even if it cannot be felt.  To keep dust down, travel at slower speeds on unpaved roads and laydown areas. If required, water mist can be used to control dust on roads and in laydown areas.	M
	Wind could make materials hard to handle	Avoid handling materials that could respond like a sail (e.g., plywood) in wind. Position vehicles so that doors do not get caught by the wind when opened. Hang onto door when opening and closing in high wind. Open and close doors carefully in the wind and only open one door at a time.	L
	Noise could cause hearing loss and make it hard to communicate	Hearing protection is required when sound levels exceed 84 dBA continuously. This rule applies to personnel working near or on heavy equipment and any other sources of loud noise.	M

<b>AHA #1 – Activity/Work Task: Mobilization and Site Setup</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
Site Setup (Unloading and initial staging of materials and equipment)  (general site hazards) (continued)	Lack of proper illumination in work areas could cause hazards to not be recognized or eye strain	During mobilization, if lighting is not yet set up, temporary lighting such as portable bright lumen flashlights may be necessary if ambient lighting is not sufficient. Work during daylight hours or provide adequate lighting source for work areas to minimize potential for injuries to occur from lack of visibility.	L
	Any ground penetrating activities– potential underground utilities could be contacted	Implement Tt Corporate Procedure EHS 3-15 – Underground Utilities and local requirements to ensure all water, power, sewer, storm drain, communications, and gas lines have been located and marked. Call 811 National One Call, contact base for as-built diagrams and further information regarding other potential utilities.	M
	Fall hazards (falls from heights of 6 feet or greater)	No person will climb upon any equipment, ASTs, shipping container, building, etc. where there is exposure to a fall of 6 feet or greater (no proper guarding and rails in place) without a means of fall protection designed by a Competent Person. At the present time, there is no fall protection plan in place to cover this task. A fall protection plan would need to be developed and implemented prior to doing the activity.	M
	Head injuries from struck by or falling objects	Wear hard hat when overhead hazards exist and when working in areas with operating construction equipment.	M
	Poisonous snakes	Watch for snakes and know how to identify ones that could be venomous. Keep hands and other body parts from placement into burrows, debris piles, or under objects or debris. Review procedures to follow in the event of a snake bite as are included in the APP.	L
	Contact with biting or stinging insects	Workers will apply DEET to work clothing following manufacturer’s instructions as a preventative measure for biting insects as required. Workers with allergies will let the SSHO know using the medical data sheet and will carry their own prescription medication as applicable. First aid and medical attention to be performed, as required.	L
	Electrical hazards could be present during tool use	Ensure that a certified electrician performs all electrical work to hook up office trailer to electrical power source.  Electrician to properly ground systems in accordance with electrical code.  Ensure that power cords are inspected and in good condition for use, that GFCIs are used properly, and portable generators are not overloaded. Ensure any power tools used are in good working condition and have third prong on cord or are double insulated. All live electrical work requires arc flash protection and a permit from the base as required by EM 385-1-1 , section 11.A.02.c	M

<b>AHA #1 – Activity/Work Task: Mobilization and Site Setup</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
Site Setup (Unloading and initial staging of materials and equipment)  (general site hazards, continued)	Workers could be injured by high winds of sudden storms.	Ensure that all debris/materials are secured. Shut down operations when wind speed is greater than 25 mph sustained or lesser based on potential hazards (e.g., tree limbs could fall) or lightning within 10 miles. Monitor the local weather report daily and as necessary for any severe weather warnings. Know the procedures to follow in the event of severe weather emergencies. Have a lightning detector on hand.	M
	Workers could be exposed to extreme temperatures and sunburn.	Monitor for heat or cold stress in accordance with EHS 4-6, Temperature Extremes. Provide fluids and rest breaks during warm weather and while wearing heavier clothing. Wear broad-spectrum sunscreen lotion with an SPF of 15 or greater.	M
	Lack of effective communication could lead to a delayed response in an emergency.	Ensure that each work team has a cellular telephone for emergency communication. A work team may substitute a 2-way radio for a cellular phone if the other radio party has access to a phone. If more than one team at a time is working, ensure that there is communication between the work teams and project management. Use the buddy system. Test the communication systems in use to ensure they function properly. Post the emergency plan in the SZ, with emergency contact list.	M
	Exposure to poison ivy or oak.	<p>As area is inspected, identify any “suspicious” vegetation that may be poison oak. Mark these areas with warning tape or spray paint in preparation for vegetation clearance. Avoid contact with these plants. Wear long sleeve shirts and pants. Wear disposable gloves. Wear an “ivy blocker” and have Technu® or Zanfel post-exposure washing agent available.</p> <p>These plants need to be removed carefully to avoid spreading vegetation throughout the site or spraying plant debris on personnel or equipment. Also cutting tools that cut this vegetation need to be cleaned and handled carefully as the oils can remain on cutting surfaces. Refer to Health and Safety Guideline (HSG) 2-8 in the CRL for details.</p>	M
	Failure to observe and prepare for encounter with insects, rodents, or snakes could cause injury to worker.	Observe for insects, rodents, and snakes. Use a “tapping” stick, if necessary, in any brush area to flush out or expose snakes before walking in brushy areas. Wear snake chaps (gaiters). Apply DEET as necessary. Avoid placing hands in concealed areas. Wear protective gloves. Use tools wherever possible to dislodge objects first, before placing hands low to ground to move objects.	M

<b>AHA #1 – Activity/Work Task: Mobilization and Site Setup</b>		
<b>Equipment to be Used</b>	<b>Training Requirements/Competent or Qualified Personnel Name(s)</b>	<b>Inspection Requirements</b>
Site vehicles	Drivers must have current state-issued driver’s license.	Daily vehicle inspection by drivers. Receipt inspection by SS.
Heavy Equipment	Operators will be qualified and experienced operators for use of the equipment they operate	Receipt inspection by SS. Daily inspection by operator.
Hand and power tools	Training in use of hand and power tools by the SSHO or designee and review of operating manual. Use proper hand tool for the task.	Daily inspection by users/operators.
Fire extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking. Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used

**Abbreviations and Acronyms:**

APP – Accident Prevention Plan  
 CHMM – Certified Hazardous Materials Manager  
 CIH – Certified Industrial Hygienist  
 CRL – Corporate Reference Library  
 CSP – Certified Safety Professional  
 dBA – decibels, A-scale  
 DEET – N,N-diethyl-m-toluamide  
 EHS – Environmental, Health, and Safety

mph – miles per hour  
 OICC – Officer In Charge of Construction  
 SSHO – Site Safety and Health Officer  
 SHM – Safety and Health Manager  
 SS – Site Superintendent  
 mph – miles per hour

**AHA Signature Sheet**

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

NAME	SIGNATURE	TITLE	DATE
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

## Activity Hazard Analysis (AHA) #2

<b>Activity/Work Task: Utility Mark-out and Erosion and Sediment Control Installation</b>	<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>	<b>M</b>
Project Location Various AST Sites, Camp Lejeune Marine Corps Base , Jacksonville, NC	<b>Risk Assessment Code (RAC) Matrix</b>	
Contract Number: N62470-13-D-8007	<b>Severity</b>	<b>Probability</b>
Date Prepared: August 2014		Frequent    Likely    Occasional    Seldom    Unlikely
Prepared by: Christine Joblon, Senior Scientist	Catastrophic	E    E    H    H    M
	Critical	E    H    H    M    L
Reviewed by: Roger Margotto, CIH, CSP, CHMM, Safety and Health Manager (SHM)	Marginal	H    M    M    L    L
	Negligible	M    L    L    L    L
<p><b>Notes:</b> (Field Notes, Review Comments, etc.)</p> <p>In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.</p> <p style="color: red;">Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated. High visibility safety vest.</p>	Step 1: Review each “ <b>Hazard</b> ” with identified safety “ <b>Controls</b> ” and determine RAC (see above).	
	“ <b>Probability</b> ” is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.	<b>RAC Chart</b>
	“ <b>Severity</b> ” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.	<b>E = Extremely High Risk</b>
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on the AHA. Annotate the overall highest RAC at the top of the AHA.	<b>H = High Risk</b>
		<b>M = Moderate Risk</b>
		<b>L = Low Risk</b>

<b>AHA #2 – Activity/Work Task: Utility Mark-out and Erosion and Sediment Control Installation</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
Locate aboveground utilities	Contact with above ground utilities could cause injury or property damage	Make sure all above- ground utilities have been identified. Call National One Call (811) prior to any ground intrusions. Contact base public works for as-built drawing or any other information they may have regarding utilities in the area.	L
Dig Alert notification, locate below ground utilities	Gas utility explosion, electrocution, wet utility rupture, fiber optic/ data/ phone line damage	Ensure that all utilities prior to the start of field work are marked (or declared absent by individual utility companies) across the areas of excavation. Identify all markings painted by the geophysical surveyor as well. Review base drawings and as-built drawings, as available. Visibly inspect areas for other potential existing utilities.	M
Stake-out excavation areas, survey/locate and mark-out underground utilities	Slips, trips, and falls	Visually inspect work areas and mark, barricade, or eliminate slip, trip, and fall hazards, if feasible. Use care in the work area; look for depressions and obstructions. Allow employees to work only on walking/working surfaces that have the strength and integrity to support employees safely. Look for burrows/ squirrel holes. Cover and mark openings 6 inches or more in diameter.	M
	Struck by vehicles traffic	Wear high-visibility reflective vests. Post an observer, as needed, when a surveyor is using instruments (a surveyor is often focused on the task and may not be aware of nearby traffic). Use traffic control or barricades, if necessary, to keep traffic away from workers.	
	Exposure to spray paint and propellant while marking underground utilities and anomalies	Follow manufacturers' instructions on the use of paint. Review the appropriate MSDS. Never point paint nozzles toward another person.	
	Worker strain from manually moving materials and equipment	Direct personnel to use proper lifting techniques Encourage the use of mechanical lifting equipment Employees will not lift more than 50 pounds alone. Encourage a steady, sustainable work pace.	
	Workers could be struck by, or against heavy equipment, or by traffic within/ adjacent the work sites	Wear high-visibility reflective vests at all times while on site. Make eye contact with operators and drivers. Use spotters. Understand and review hand signals. Use traffic barricades, signs, delineators, cones, flags, and backup spotters.	
	Back injury	Do not lift more than 50 pounds at a time (alone). Use Team Lifting Techniques Use mechanical means to lift load.	
	Biological hazards such as snakes, insects, ticks, or spiders could cause poisoning, disease	If deemed necessary, wear leather gloves and/ or nitrile gloves when working. Use insect repellent as necessary. Before donning, drop work gloves on the ground and step across their entire surface to reduce the likelihood of bee, spider, scorpion bites/ stings.	

Stake-out excavation areas, survey/locate and mark-out underground utilities (continued)	Worker exposure to extreme temperatures (Heat exhaustion/ heat stroke)	Monitor for heat stress and implement heat stress prevention in accordance with EHS Procedure 4-6, Temperature Extremes. Provide fluids and rest breaks during warm weather, and while wearing impermeable protective clothing.	M		
	Worker exposure to extreme temperatures (Cold Stress)	Monitor for cold stress and implement prevention in accordance with EHS Procedure 4-6, Temperature Extremes.			
	Eye Injury	Safety glasses (clear or tinted) are the minimum required eye protection for all work areas.			
Installation of Erosion and Sediment Controls (Silt Fence, haybales, etc)	Construction equipment and vehicles could cause injury to personnel if operating in the vicinity	Construction equipment will have backup alarms installed. Workers working around construction equipment will stay out of the swing radius and to enter the swing radius, must make contact with the operator and have operator acknowledgement prior to entry. Wear high visibility vests when working around areas where vehicle and equipment traffic may be.	M		
	Slips, trips, and falls while carrying tools and equipment	Ensure you carry materials and tools with sharp ends facing out and away from body so that if you do fall, you do not fall onto them. Watch your steps. Try to have trucks deliver materials as close to area you are working to reduce hand carrying.			
	Hand injuries or other cuts from handling sharp debris or splinters in wood stakes or cutting tools.	Ensure tools and equipment are in good condition. Wear leather work gloves when handling equipment and tools. For cutting silt fence, use retractable blade knives. Never carry a knife in any pocket on one's body.			
	Use of hand tools such as shovels, hammers, and rakes	Use the right tool for the job. Inspect tools before use. Do not use defective tools. Wear gloves when using any pounding tools or shovels and rakes. Keep hands free of area where hammers are being used and control the swings to smooth precise swings and not blows from a distance. Do not use hammers that are loose from handle.			
	Movement of heavy material or frequent bending over to pick up debris may cause back strain.	Direct personnel to use proper lifting techniques, such as keeping the back straight, lifting with the legs without twisting, and getting help when moving bulky/heavy materials and equipment. Encourage the use of lifting equipment and use of a hand-truck whenever possible. Employees will not lift more than 50 pounds alone. Encourage a steady, sustainable work pace. Take breaks and rotate the work to avoid repetitive stress to the back.			
	Potential to fall onto fence posts if approaching from uphill side	If it is possible for a person to fall onto a fence post now or during re-inspection, fence post caps will be installed on the top of the posts in these areas.			
	Inspect and maintain erosion controls	Slips, trips, and falls while carrying tools and equipment or not watching where you are going.		Ensure you carry materials and tools with sharp ends facing out and away from body so that if you do fall, you do not fall onto them. Watch your steps. Try to have trucks deliver materials as close to area you are working to reduce hand carrying.	M

<p>Inspect and maintain erosion controls (continued)</p>	<p>Working around active and ongoing construction activities</p>	<p>Wear a high visibility vest when working in traffic areas. Ensure that you face and acknowledge oncoming vehicles or vehicles coming up behind you on roads and ensure the driver sees you. Before entering areas, observe ongoing activities and get in touch with operators to let them know you are in the work area and let them know when you leave. NOTE: If any traffic requires a flag person or a worker to direct traffic, that worker must receive training as required by EM 385-1-1 Section 08.C. Persons directing traffic and the signage used must follow the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD)</p>	
	<p>Shoveling out behind silt fences or repairing silt fences for maintenance could cause ergonomic strain</p>	<p>Direct personnel to use proper lifting techniques, such as keeping the back straight, lifting with the legs without twisting at the waist, and getting help when moving bulky/heavy materials and equipment. Encourage the use of lifting equipment and use of a hand-truck whenever possible. Employees will not lift more than 50 pounds alone. Encourage a steady, sustainable work pace. Take breaks and rotate the work to avoid repetitive stress to the back.</p>	
	<p>Using fence post pounders can result in severe injuries to user or assistant</p>	<p>Do not have any workers position head or hands under pounder or hold fence posts during pounding of the post as they could be struck and injured.</p> <p>Operator can also be injured if pounder is not properly secured onto or comes off of post when being driven as the pounder is heavy and worker's face could be pulled into the post trying to hang onto pounder.</p> <p>Wear eye and face protection (shield) as well as hard hat when pounding fence posts into the ground. Wear leather work gloves when using these tools and handling these materials. Do not raise pounder off of the post between pounds.</p>	
	<p>Use of hand tools such as shovels, hammers, and rakes</p>	<p>Use the right tool for the job. Inspect tools before use. Do not use defective tools. Wear gloves when using any pounding tools or shovels and rakes. Keep hands free of area where hammers are being used and control the swings to smooth precise swings and not blows from a distance. Do not use hammers that are loose from handle.</p>	
<p>Installation of stockpile areas, signage, etc.</p>	<p>Injury from improper use of power and hand tools</p>	<p>Maintain steady pace when using tools and take adequate rest periods. Use appropriate tools for the task and maintain tools in good condition. Wear leather work gloves when using tools. Avoid working too close to other workers. Inspect all tools for damage before each use, including electrical cords/ pneumatic hoses. Ensure double insulation on electrical tools. Train personnel in the proper use of hand tools. GFCI required for all connections to outdoor use of power tool and other electrical equipment insulation.</p>	<p>M</p>

Installation of stockpile areas, signage, etc. (continued)	Workers could be cut by the metal edges of signs, by the wires used to attach the signs, or by wires on the fence	Wear leather work gloves.	M
	Worker strain from manually moving materials and equipment	Direct personnel to use proper lifting techniques during the first tailgate meeting. Encourage the use of lifting equipment and use of a hand-truck whenever possible. Employees will not lift more than 50 pounds alone. Encourage a steady, sustainable work pace.	
Place plastic liner/fabric liner for stockpile and decon areas	Roll of material could fall and injure workers. Roll could roll on to worker	Keep hands clear of sharp objects and pinch points. Pinch points include the hand or feet between the roll and the ground. Never work in front of a roll. Always work from a side.	
	Workers could cut themselves while cutting fencing or liner material	Always cut away from the body. Wear leather work gloves when working with the knife. Always shield the knife after use. NEVER place the knife in any pocket on the body.	
	Strains from manually moving materials and equipment	Personnel shall be directed to use proper lifting techniques such as keeping the back straight, lifting with the legs, limiting twisting, and getting help in moving bulky/heavy materials and equipment. Use of hand truck shall be encouraged. Employees will not lift more than 50 pounds.	

<b>AHA #2 – Activity/Work Task: Utility Mark-out and Erosion and Sediment Control Installation</b>		
<b>Equipment to be Used</b>	<b>Training Requirements/Competent or Qualified Personnel Name(s)</b>	<b>Inspection Requirements</b>
Site vehicles	Drivers must have current state-issued driver's license.	Daily vehicle inspection by drivers. Receipt inspection by SS.
Heavy Equipment	Operators will be qualified and experienced operators for use of the equipment they operate	Receipt inspection by SS. Daily inspection by operator.
Hand and power tools	Training in use of hand and power tools by the SSHO or designee and review of operating manual. Use proper hand tool for the task.	Daily inspection by users/operators. Inspect tools and power cords to ensure they are listed by a NRTL. Inspect for damage to tool and to cords.
Fire extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.

<b>AHA #2 – Activity/Work Task: Utility Mark-out and Erosion and Sediment Control Installation</b>		
<b>Equipment to be Used</b>	<b>Training Requirements/Competent or Qualified Personnel Name(s)</b>	<b>Inspection Requirements</b>
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking. Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used

**Abbreviations and Acronyms:**

- AHA – Activity Hazard Analysis
- APP – Accident Prevention Plan
- CIH - Certified Industrial Hygienist
- CSP - Certified Safety Professional
- EHS – Environmental, Health, and Safety
- MSDS – Material Safety Data Sheet
- NRTL - Nationally Recognized Testing Laboratory
- RAC – Risk Assessment Contractor
- SSHO – Site Safety and Health Officer
- SS – Site Superintendent

**AHA Signature Sheet**

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

NAME	SIGNATURE	TITLE	DATE
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## Activity Hazard Analysis (AHA) #3

<b>Activity/Work Task: AST and Piping Removal</b>	<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>	<b>M</b>
Project Location: Various AST Sites, Camp Lejeune Marine Corps Base , Jacksonville, NC	<b>Risk Assessment Code (RAC) Matrix</b>	
Contract Number: N62470-13-D-8007	<b>Severity</b>	<b>Probability</b>
Date Prepared: August 2014		Frequent    Likely    Occasional    Seldom    Unlikely
Prepared by: Christine Joblon, Senior Scientist	Catastrophic	<b>E</b> <b>E</b> <b>H</b> <b>H</b> <b>M</b>
	Critical	<b>E</b> <b>H</b> <b>H</b> <b>M</b> <b>L</b>
Reviewed by: Roger Margotto, CIH, CSP, CHMM, Program SHM	Marginal	<b>H</b> <b>M</b> <b>M</b> <b>L</b> <b>L</b>
	Negligible	<b>M</b> <b>L</b> <b>L</b> <b>L</b> <b>L</b>
<p><b>Notes:</b> (Field Notes, Review Comments, etc.)</p> <p>In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.</p> <p style="color: red;">Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated, High visibility safety vest.</p>	Step 1: Review each “ <b>Hazard</b> ” with identified safety “ <b>Controls</b> ” and determine RAC (see above).	
	“ <b>Probability</b> ” is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.	<b>RAC Chart</b>
	“ <b>Severity</b> ” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.	<b>E = Extremely High Risk</b>
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on the AHA. Annotate the overall highest RAC at the top of the AHA.	<b>H = High Risk</b>
		<b>M = Moderate Risk</b>
		<b>L = Low Risk</b>

<b>AHA #3 – Activity/Work Task: AST and Piping Removal</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
General activities related to AST and piping removal	Biological hazards such as snakes, insects, or spiders could cause injury or bites.	Wear PPE. Look carefully for snakes before stepping into any area or before placing hands near the ground. Watch out for snakes when disturbing rubble or debris. Use insect repellent as necessary. Use care around debris and locations where spiders, especially black widow spiders, may be found (such as tall vegetation, well housings, out houses and so forth).	L
	Slips, trips, falls could occur	Maintain alertness to slip, trip, and fall hazards. Maintain good housekeeping around work areas. Wear footwear with soles that grip.	M
Utility Clearance	Failure to mark all utilities could cause inadvertent contact with energized lines during the demolition.	Mark all utilities. Ensure that all lines are marked per standard color code system for utility marking. Review as-built drawings.	M
De-Energize AST System	Failure to properly disconnect all connections could electrocute worker.	Contact electrician to disconnect all power lines and power connections to the site. EM 385-1-1 11.A.02 (c) states that any live electrical work requires a permit from a government designated authority (GDA). Obtain electrician's sign-off that all power has been disconnected. Inspect each item of equipment to validate that each item is de-energized.	M
	Assuming power is off when it is not could cause workers to be electrocuted.	Test each power cord or attached wires to each piece of equipment using a volt-ohm meter or other power-testing instrument.	M
	Failure to remove pressure from any item could cause workers to be injured by an outward release of pressure.	Inspect any pressurized item of equipment. Ensure that no item is pressurized. Bleed of any gases or air using a pressure relief valve. Release air slowly. If a unit is pressurized by a gas other than air, stand back from the valve so that the gas dissipates. (Some units use pressurized nitrogen gas.)	M
	Uncertainty about status of the equipment could cause a worker to be exposed to energy in units that have not been tested.	Mark each item that has been tested as de-energized. Develop and use a distinct marking system on each piece of equipment tested.	M

Asphalt/Concrete Cutting and Removal (if necessary)	Improper use of asphalt/concrete saw could cause injury to workers.	Review user manual and operate equipment in accordance with manufacturer's recommendation. Ensure asphalt/concrete is wetted properly for cooling and dust mitigation. Ensure blade guards are in place. Never handle blades with bare hands. Use leather cut-resistant gloves when handling blades,	M
	Flying debris could cause injury to workers. Inhalation of dust could cause exposure to dust containing asphalt or silica dust from concrete sawing.	Ensure guards are in place. Ensure asphalt/concrete is wetted properly. Ensure workers maintain safe distance. Exposure to concrete dust can cause exposure to silica dust. Avoid generating dust by use water mist. If necessary a full face respirator with P-100 cartridges will be used, if dust cannot be controlled.	L
	Caught by rotating parts.	Ensure asphalt/concrete saw is turned off prior to performing maintenance. Disconnect saw from a power source or disconnect the spark plug wire before servicing. Read and follow the operator's manual. Avoid wearing loose clothing or gloves that may get caught in rotating parts. Ensure guards are in place.	M
	Strains and sprains caused by heavy lifting of asphalt/concrete	Remove and lift concrete/asphalt debris with heavy equipment. Avoid generating dust.	L
	High noise levels could cause ear injury.	Use hearing protection when exposed to excessive noise level (greater than 85 dBA over an 8-hour work period). Assess noise level with sound level meter if possibility exists that noise level may exceed 85dBA.	L
Soil excavation/hand digging to expose subsurface lines (if necessary)	Construction equipment could cause injury to personnel.	Workers operating construction equipment will be qualified and designated operators. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt while seated. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed. Workers working around construction equipment will stay out of the swing radius and to enter the swing radius, must make contact with the operator and have operator acknowledgment prior to entry. Only personnel necessary to perform work tasks will be in controlled work zones around heavy equipment and must remain visible to the operator. Operator's manual required for equipment. All spotters and ground personnel in area will high visibility safety vests.	M
	Handling Heavy Objects could cause injury to personnel.	Observe proper lifting techniques. Refer to Hoisting and Rigging AHA #8 for proper lifting techniques.	M
	Open excavation could present a slip/trip/fall hazard.	Ensure work area is delineated and high visibility fencing or similar signage surrounds open excavations. Minimize time excavations are open. Clear walkways of equipment, vegetation, excavated material, tools, and debris. Identify and mark or remove any slip/trip fall hazards that may be present.	M

Soil excavation/hand digging to expose subsurface lines (if necessary) (continued)	Hazardous atmospheres may be present.	It is anticipated that AST demolition-related excavations will be limited to shallow excavations (less than 4 feet deep). Perform periodic air monitoring in breathing zones, as necessary, to test for toxic vapors. (4-gas meter for LEL, oxygen, carbon monoxide and hydrogen sulfide gas. Use a photoionization detector (PID))	M
	Contact with underground utilities could cause injury to workers and damage to property or equipment.	Inspect the area for utilities and clearance for heavy equipment. Verify that all electrical supply to the UST has been de-energized. Verification is to be performed by a state of North Carolina-licensed electrical contractor. Follow EM 385-1-1 Lockout/Tagout procedures and the TtEC procedure in the SHSP. In areas where known utilities traverse the area to be excavated, dig by hand (within 3 feet) to expose the line.	M
	Contact with overhead utilities could cause injury to workers and damage to property or equipment.	Ensure that the area has been surveyed and that the boom will not contact overhead lines (minimum 15-foot clearance required).	M
	Failure to contact locator services could cause damage to existing lines. The potential exists for electrocution or other release of energy that could injure workers.	Contact utility locator service. Ensure that all utility lines are marked. Ensure that a "ticket" number has been issued by North Carolina One Call(811). In addition, a third party locator should be subcontracted to check for the presence of utilities.	M
Product removal -Draining lines into tank	Workers could be exposed to gasoline and diesel fluids and vapors.	After opening line, monitor the line for vapors using a PID and a combustible gas meter. If there are fumes and vapors assume lines have residual fuels. If monitoring in the breathing zone with a PID shows that vapors or fumes equal or exceed 10 ppm, worker will be required to wear a full face respirator with organic vapor cartridges. (The SSHP requires notification of the CIH prior to wearing respirators so that a cartridge change schedule can be provided.) Use of respirator requires modification of the SHHP and an FCR.	M
Product removal -Pump product into vacuum trucks	Workers could be exposed to gasoline, diesel, and vapors.	After opening line, monitor the line for vapors using a PID and a combustible gas meter. If there are fumes and vapors assume lines have residual fuels.	M
	Flammable gases or vapors can explode or be ignited.	All equipment used in area including the PID and the combustible gas meter must be rated as intrinsically safe (Class I, Division 1, Group D). Ensure pipes and tanks are grounded. Ensure that vacuum truck tank is bonded to the pipe and the tank. Ensure that all electricity has been disconnected. Ensure that all heat or spark producing equipment, including the vacuum truck, is at least 25-feet from the operation. Exhaust from the vacuum pump on the truck can be flammable. Ensure truck is designed to collect or dissipates these fumes so that there is no explosion or fire.	M

<p>Inerting Tank -Measure tank atmosphere</p>	<p>Workers could be exposed to gasoline and diesel fluids and vapors. Flammable gases or vapors can explode or be ignited.</p>	<p>Check for vapors using a PID and combustible gas meter. If there are fumes and vapors, assume lines have residual fuels. If monitoring in the breathing zone with a PID shows that vapors or fumes equals or exceeds 10 ppm, worker will be required to wear a full face respirator with organic vapor cartridges. (The SSHP requires notification of the CIH prior to wearing respirators so that a cartridge change schedule can be provided.)</p>	<p>M</p>
<p>Inerting Tank -De-gas the tank by approved inerting method</p>	<p>Potential exposure to chemical contaminants, high levels of carbon dioxide from the sublimation of the dry ice. Thermal injuries by dry ice.</p>	<p>Avoid placing head near any openings to avoid exposure to contaminants and carbon dioxide. If dry ice is used, wear protective gloves when handling (Heavy duty thermal lined gloves). Never place dry ice in any sealed container. Do not "play" with dry ice.</p>	<p>M</p>
<p>Clean Tank -Use of pressure washer</p>	<p>Washer may have defective parts causing unit to operate unsafely.</p>	<p>Verify that there is an owner/operator's manual with the washer. Review the operational instructions relevant to the inspection of the washer prior to use. Inspect all connections. Inspect for safety clamps on hoses as required by manufacturer (if applicable). Inspect the wand for blockage and damage. Inspect all controls to assure that they are clearly marked.</p>	<p>L</p>
	<p>Location of pressure washer may interfere with other equipment in area.</p>	<p>Ensure that unit does not get in way of other equipment or vehicles.</p>	<p>L</p>
	<p>Poor connection could cause water to leak and hose to rupture. The hose can whip around and strike a worker.</p>	<p>Double-check connections. Ensure that washers are installed to minimize dripping. Use safety clamps on connections (whip checks), where necessary.</p>	<p>L</p>
	<p>High-pressure washing can be used for this task. High-pressure setting can injure people, splash water into face.</p>	<p>Permit only properly trained personnel to operate the pressure washer. Wear required PPE (work uniform, leather work gloves, face shield; (safety glasses are worn under face shield). Use only the handle to hold the wand. Never point wand at people or yourself. Verify that operating pressure is the desired pressure. Turn off unit immediately if pressure cannot be regulated to desired level.</p>	<p>M</p>
	<p>Worker could trip over hoses.</p>	<p>Use care to avoid tripping over hoses. Try to keep as much of the hose as possible from the path of travel. Keep the hose behind you. Keep other workers out of work area.</p>	<p>M</p>
	<p>Improper servicing of pressure washer could injure worker or cause damage to equipment and nearby property.</p>	<p>Always turn the unit off before servicing. Safely bleed off all pressure in lines and hoses before servicing. Never point nozzle toward yourself. If nozzle needs servicing, remove it from line before servicing.</p>	<p>M</p>

Clean Tank -Use of pressure washer (continued)	Workers could cause fire, be exposed to fuel or spill fuel on ground while refueling pressure washer.	Refuel unit only in a designated area. Never refuel the unit while the unit is running. Cool unit down before refueling. Store fuel only in approved containers. If using gasoline, be sure to use proper grounding and bonding when fueling the unit. *Note: if unit is mounted on back of truck, verify that the unit is grounded and then bond to unit when refueling. Wear PPE when refueling, which includes the use of protective gloves. Have spill control materials available in the event of a spill. Ensure that there is a fire extinguisher whenever refueling.	M
Clean Tank -Pump out rinseate with vacuum truck.	Workers could be exposed to gasoline and diesel fluids and vapors. Spills. Hose could leak or rupture	After opening line monitor the air (in breathing zone) for vapors using a PID and a combustible gas meter. Always inspect all hoses and connections.	M
Clean Tank -Rinse tank two more times.	Spills. Hose could leak or rupture	Always inspect all hoses and connections.	L
Removal of Tank and Appurtenances -Measure atmosphere	Workers could be exposed to gasoline and diesel fluids and vapors. Flammable gases or vapors can explode or be ignited	Check for hazardous vapors in breathing zone using a PID and combustible gas meter. If there are fumes and vapors assume lines have residual fuels. Be sure to check oxygen level first (LEL reading is not accurate if oxygen level is below 16%)	M
Removal of Tank and Appurtenances -Excavate around tanks	Potential for tanks to be struck by equipment.	Know approximate location and depth of each tank. Excavate carefully around each tank. Workers are not allowed in excavation.	M
Removal of Tank and Appurtenances-Disconnect / disassemble equipment and components	Employees could be injured by pressurized vessels or lines.	Open all air pressure relief valves prior to disconnecting components.	M
	Failure to plan the removal of components in proper order could cause other components to fall or affect the safe removal of the components.	Plan the removal of components in a specified order as determined by an engineer. Disconnect all connecting lines (after de-energizing has been assured). Remove each component from its attachments to the pad in a specified manner as determined by an engineer.	M
	Dropped objects could cause injury.	Wear steel-toe or hard toe boots.	M
	Manual lifting could cause back injuries.	Instruct personnel in proper lifting techniques. Instruct personnel to get assistance for heavy loads. Use mechanical devices in place of manual lifting.	M

Removal of Tank and Appurtenances-Disconnect / disassemble equipment and components (continued)	Punctures or cuts could occur. Pinching hands or feet	Maintain alertness for sharp metal. Wear leather work gloves. Avoid placing hands between components or components and material handling equipment.	L
	Slips, trips, falls could occur	Maintain alertness to slip, trip, and fall hazards. Maintain good housekeeping around work areas. Wear footwear with soles that grip.	M
Cutting of associated AST components (metal tank, metal pipes)	Welding/cutting may produce sparks and cause injury to personnel/fire hazard	Use not-sparking equipment when possible. If sparking equipment is used, hot work procedures will be followed; Ensure that a hot work permit is obtained from the Base Fire Department prior to conducting hot work. Conduct hot work activities in accordance with TtEC safety procedure. Do not perform hot work in environments with flammable atmospheres (check using air monitoring equipment). Keep a fire extinguisher nearby. Use a fire watch. Stop hot work activities when LEL reaches 10%.	MH
Mixing of concrete and pumping to plug ends of underground pipe	Mixing of concrete, exposure to silica dust	Avoid dust by wetting concrete and mixing slowly.	M
	Pump may have defective parts causing unit to operate unsafely.	Verify that there is an owner/operator's manual with the pump. Review the operational instructions relevant to the inspection of the pump prior to use. Inspect all connections. Inspect for safety clamps on hoses as required by manufacturer (if applicable). Inspect all controls to assure they are marked.	L
	Workers could cause fire, be exposed to fuel or spill fuel on ground while refueling pressure washer.	Refuel unit only in a designated area. Never refuel the unit while the unit is running. Cool unit down before refueling. Store fuel only in approved containers. If using gasoline, be sure to use proper grounding and bonding when fueling the unit. *Note: if unit is mounted on back of truck, verify that the unit is grounded and then bond to unit when refueling. Wear PPE when refueling, which includes the use of protective gloves. Have spill control materials available in the event of a spill. Ensure that there is a fire extinguisher whenever refueling.	L
	Spills. Hose could leak or rupture	Always inspect all hoses and connections.	L
	Manual lifting could cause back injuries.	Instruct personnel in proper lifting techniques. Instruct personnel to get assistance for heavy loads. Use mechanical devices in place of manual lifting.	L
Use excavator or backhoe for lifting equipment or components over 50 pounds.	Workers could be injured by equipment.	Use proper hoisting locations on the object being lifted. Use proper lifting location on heavy equipment. Inspect all slings prior to use. Use a properly rated sling rated for the load it is lifting. Use a tag line to stabilize the load and prevent swinging. Follow AHA #8 for Hoisting and Rigging	M
	The boom of heavy equipment could strike overhead obstructions (if present).	Lifting (hoisting) of equipment may not be possible with overhead obstructions, depending on boom height and obstruction height. Verify that the boom will not strike overhead obstructions when lifting components. Always use a spotter when obstructions are present.	M

<b>AHA #3 – Activity/Work Task: AST and Piping Removal</b>		
<b>Equipment to be Used</b>	<b>Training Requirements/Competent or Qualified Personnel Name(s)</b>	<b>Inspection Requirements</b>
Site vehicles	Drivers must have current state-issued driver’s license.	Daily vehicle inspection by drivers. Receipt inspection by SS.
Heavy Equipment	Operators will be qualified and experienced operators for use of the equipment they operate	Receipt inspection by SS. Daily inspection by operator.
Monitoring Equipment	Trained SSHO or safety trained person (validated by CIH)	Inspect each day of use. Calibrate each day of use. Ensure equipment is intrinsically safe.
Pressure Washer	Training in operation, maintenance and use of the pressure washer. Review operator’s manual.	Daily and before use. Use form provided in plan or a form provided in the operator’s manual. Pay specific attention to all connections and to the condition of the wand and fueling activities.
Pump for concrete	Training in operation, maintenance and use of the pressure washer. Review operator’s manual.	Daily and before use. Use form provided in plan or a form provided in the operator’s manual. Pay attention to all connections and fueling activities.
Hand and power tools	Training in use of hand and power tools by the SSHO or designee and review of operating manual. Use proper hand tool for the task.	Daily inspection by users/operators.
Fire extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking. Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used

**Abbreviations and Acronyms:**  
 APP – Accident Prevention Plan  
 AST – above ground storage tank  
 CHMM – Certified Hazardous Materials Manager  
 CIH – Certified Industrial Hygienist  
 CSP – Certified Safety Professional  
 LEL – lower explosive limit  
 PID – photoionization detector  
 PPE – personal protective equipment  
 SHM – Safety and Health Manager  
 SSHO – Site Safety and Health Officer  
 SS – Site Superintendent

**AHA Signature Sheet**

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

NAME	SIGNATURE	TITLE	DATE
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## Activity Hazard Analysis (AHA) #4

<b>Job/Task: Confined Space Entry (includes rivet busting and AST tank cleanout)</b>	<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>	<b>M</b>
Project Location: Various AST Sites, Camp Lejeune Marine Corps Base , Jacksonville, NC	<b>Risk Assessment Code (RAC) Matrix</b>	
Contract Number: N62470-13-D-8007	<b>Severity</b>	<b>Probability</b>
Date Prepared: August 2014		Frequent    Likely    Occasional    Seldom    Unlikely
Prepared by Christine Joblon, Senior Scientist	Catastrophic	<b>E</b> <b>E</b> <b>H</b> <b>H</b> <b>M</b>
	Critical	<b>E</b> <b>H</b> <b>H</b> <b>M</b> <b>L</b>
Reviewed by (Name/Title): Roger Margotto, CSP, CIH, Program SHM	Marginal	<b>H</b> <b>M</b> <b>M</b> <b>L</b> <b>L</b>
	Negligible	<b>M</b> <b>L</b> <b>L</b> <b>L</b> <b>L</b>
<p><b>Notes:</b> (Field Notes, Review Comments, etc.)</p> <p>In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.</p> <p><b>Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt), and protective clothing (i.e., PVC raingear or poly-tyvek). Hearing protection (as required). Work gloves worn when indicated, High visibility safety vest.</b></p>	Step 1: Review each “ <b>Hazard</b> ” with identified safety “ <b>Controls</b> ” and determine RAC (See above)	
	“ <b>Probability</b> ” is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom, or Unlikely.	<b>RAC Chart</b>
	“ <b>Severity</b> ” is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	<b>E = Extremely High Risk</b>
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on AHA. Annotate the overall highest RAC at the top of AHA.	<b>H = High Risk</b>
		<b>M = Moderate Risk</b>
		<b>L = Low Risk</b>

<b>AHA 4 – Job/Task: Confined Space Entry (includes rivet busting and AST tank cleanout)</b>			
Job Steps	Hazards	Controls	RAC
1. Rivet busting to open tank for access for CSE (includes setup and use of compressor and pneumatic rivet buster tool – cold cutting techniques)	See Job Steps 2 a through 2 c below	1. See Job Steps 2a through 2c below	M
2.a Staging and setup of compressor and compressor hoses	Improper staging of compressor could lead to injuries (struck by, pinch point)	<ol style="list-style-type: none"> <li>1. Use spotter when backing up trailer compressor.</li> <li>2. Set parking brake on haul vehicle when parked prior to unhitching trailer.</li> <li>3. Chock wheels on compressor.</li> </ol>	M

<b>AHA 4 – Job/Task: Confined Space Entry (includes rivet busting and AST tank cleanout)</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
		<ol style="list-style-type: none"> <li>4. Wear leather work gloves when unhitching trailer.</li> <li>5. Park compressor on level stable ground.</li> <li>6. Wear high visibility vest when working around vehicles, heavy equipment, and traffic.</li> </ol>	
	Sudden release of pressure from compressor hose if damaged or disconnected while under pressure	<ol style="list-style-type: none"> <li>1. Secure hoses and cords out of walking areas and keep from contact with sharp edges that could cause cuts or wear and tear that could lead to failure.</li> <li>2. Inspect hose for damage before use, ensure whip checks are in place and properly connected at connection points.</li> </ol>	M
	Trip hazards form hoses/cords in the work area	<ol style="list-style-type: none"> <li>1. Use good housekeeping practices</li> <li>2. Remove identified trip hazards or make them visible if unable to move them from the work area.</li> <li>3. Route workers around hoses and cords.</li> </ol>	L
	Noise hazard leading to hearing loss from compressor operation	<ol style="list-style-type: none"> <li>1. Hearing protection is required when sound levels exceed 84 dBA continuously.</li> </ol>	M
2b. Pre-task monitoring for potential hazardous atmospheres	Failure to pre-monitor or ventilate work area could lead to vapor exposure	<ol style="list-style-type: none"> <li>1. Before beginning rivet busting task, monitor work area using PID.</li> <li>2. Follow industrial hygiene monitoring protocol in the APP to evaluate whether respiratory protection is required.</li> <li>3. PID will be calibrated daily and calibration documented.</li> <li>4. If respiratory protection is required, a full face, air purifying respirator with organic vapor/P-100 cartridges will be worn.</li> <li>5. -Workers will be fit-tested and medically qualified to wear respirator.</li> <li>6. If this task is the first exposure of tank to opening, workers will wear full face air purifying respirator as stated above until exposure assessment dictates downgrading is allowed (after monitoring and SHM concurrence).</li> </ol>	M
	Failure to pre-monitor or ventilate work area could lead to fire or explosion	<ol style="list-style-type: none"> <li>1. Before beginning rivet busting task, monitor work area using LEL/oxygen gas detector and ensure less than 10 % LEL is present.</li> <li>2. If LEL is not below 10%, ventilate area and retest.</li> <li>3. 4-gas meter will be calibrated daily and calibration documented.</li> <li>4. Ventilate space.</li> <li>5. Stage a minimum 10A:60BC fire extinguisher in the support zone work area.</li> </ol>	M
2c. Pneumatic rivet buster operation	a. Pinch points from or struck by moving parts	<p>a.</p> <ol style="list-style-type: none"> <li>1. Other workers will remain clear of the work area when rivet busting is performed.</li> <li>2. Perform rivet cutting away from the body and feet to minimize potential for rivet to fly and strike worker or for tool to slip and hit worker.</li> </ol>	M

<b>AHA 4 – Job/Task: Confined Space Entry (includes rivet busting and AST tank cleanout)</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
	b. Struck by hose under pressure.	<ol style="list-style-type: none"> <li>3. Wear steel toe leather work boots (metatarsal guards may also be used if subcontractor hazard assessment dictates their use). Wear face shield.</li> <li>4. Review and be familiar with manufacturer's instruction on proper use of, maintenance, and repair or adjustment of pneumatically operated tool.</li> <li>5. If there is a need to adjust pneumatic tool, de-energize by shutting down compressor and bleed off air pressure prior to making adjustments to the tool or changing bits.</li> <li>6. Wear cut resistant leather work gloves when rivet busting.</li> <li>7. Keep body parts out of pinch points between tool moving parts and tool/rivet.</li> </ol> <p>b.</p> <ol style="list-style-type: none"> <li>1. Verify whip checks are in place after any changes are made to tool.</li> <li>2. If there is a need to adjust pneumatic tool, de-energize by shutting down compressor and bleed off air pressure prior to making adjustments to the tool or changing bits.</li> </ol>	
	Contact with sharp objects	<ol style="list-style-type: none"> <li>1. Clear work area to avoid contact with sharp edges and items.</li> <li>2. Wear cut-resistant inner gloves with leather outer gloves when handling any sharp materials.</li> <li>3. Avoid handling tank metal edges with hands.</li> <li>4. Once cut, the tank edges will be folded back using excavator bucket and thumb.</li> </ol>	M
	Potential for fires or explosions due to tank vapors or from cutting tasks performed improperly (e.g., those that produce sparks)	<ol style="list-style-type: none"> <li>1. Monitor work area during rivet busting tasks using PID and LEL/oxygen gas detector and ensure less than 10 % LEL is present and remains present.</li> <li>2. 4-gas meter will be calibrated daily and calibration documented.</li> <li>3. If LEL is not below 10%, ventilate area and retest.</li> <li>4. Keep a minimum 10A:60BC fire extinguisher in the support zone work area (within 25 feet of work area).</li> <li>5. Standard work uniform unless subcontractor hazard analysis requires use of fire retardant coveralls as a precaution.</li> <li>6. Any spark producing equipment must be engineered to eliminate or reduce the potential for creating a spark otherwise the work is considered to be hot work (not currently part of this task).</li> <li>7. Grounding and bonding techniques will be utilized.</li> <li>8. Less than 25 ohms of resistance is recommended.</li> </ol>	M
	Exposure to dust or debris	<ol style="list-style-type: none"> <li>1. Use dust suppression as necessary if dust is generated during task.</li> <li>2. Wear safety glasses and plastic face shield (unless full face air</li> </ol>	M

<b>AHA 4 – Job/Task: Confined Space Entry (includes rivet busting and AST tank cleanout)</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
		<ul style="list-style-type: none"> <li>purifying respirator is worn) during rivet busting task.</li> <li>3. Wear a hard hat.</li> </ul>	
	Exposure to vapors	<ul style="list-style-type: none"> <li>1. Follow industrial hygiene monitoring protocol for PID use in the APP to evaluate whether respiratory protection is required.</li> <li>2. PID will be calibrated daily and calibration documented.</li> <li>3. If respiratory protection is required, a full face, air purifying respirator with organic vapor/P-100 cartridges will be worn.</li> <li>4. Workers will be fit-tested and medically qualified to wear a respirator</li> </ul>	M
	Over exertion	<ul style="list-style-type: none"> <li>1. Do not lift over 50 lbs alone.</li> <li>2. Face load, feet shoulder width apart and lift with a straight back.</li> <li>3. Do not twist while using or lifting tools.</li> <li>4. Pace yourself and take a break if necessary.</li> <li>5. Use a buddy system to minimize over exertion.</li> <li>6. Use proper body positioning for the task that reduces strain.</li> </ul>	M
	Slips, trips, and falls	<ul style="list-style-type: none"> <li>1. Properly store tools and equipment.</li> <li>2. Unnecessary tools should be removed from the work area.</li> <li>3. Observe walking/working areas and look where you are going prior to repositioning in work area.</li> </ul>	M
3. CSE, cleaning, and inspection of tanks	CONFINED SPACE HAZARD when working inside tanks (general)	<ul style="list-style-type: none"> <li>1. Confined space entry plans, including permits must be followed as specified in the APP, 29 CFR 1910.146, ANSI Z117.1, and EM 385-1-1 (Section 34). Contact SHA before proceeding with entry.</li> <li>2. All personnel on CSE team must have received confined space training and be designated as entrant, attendant, or supervisor by their employer.</li> <li>3. - CSE Supervisor TBD _____</li> <li>4. - CSE Attendant TBD _____</li> <li>5. - CSE Entrant TBD _____</li> <li>6. TtEC EHS Procedure 6-1 (Confined Space Program) or equivalent program/procedures of subcontractor must be in place.</li> </ul>	M
	Ladder if not installed properly could tip or slide.	<ul style="list-style-type: none"> <li>1. Ladder must be setup 4V:1H</li> <li>2. Ladder will be tied off at top.</li> <li>3. Ladder must extend 3-feet above top of tank entrance.</li> </ul>	M
	Climbing up or down ladder, workers could lose grip and fall.	<ul style="list-style-type: none"> <li>1. Do not carry tools or equipment while climbing up or down ladder.</li> <li>2. Have tools or equipment lowered down into the workplace for work in the tank and raised up before leaving tank.</li> </ul>	M
	Insufficient O <sub>2</sub> or gas such as H <sub>2</sub> S, CO may be present in tank causing	<ul style="list-style-type: none"> <li>1. Air inside the tank must be monitored prior to entry and continuously during CSE work for O<sub>2</sub>, H<sub>2</sub>S, and CO as detailed in APP using a 4-</li> </ul>	M

<b>AHA 4 – Job/Task: Confined Space Entry (includes rivet busting and AST tank cleanout)</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
	asphyxiation or exposures	gas meter. 2. 4-gas meter will be calibrated daily and calibration documented. 3. Entry into tank is not permitted if outside of the following limits 4. (O2 must be 20.8% and less than 22%) 5. CO must be less than 10 ppm 6. H2S must be less than 5 ppm (50% of PEL). 7. Exit the tank if the above levels are exceeded. 8. Ventilate space. 9. Do not re-enter space unless the levels above are met.	
	Potential flammable or explosive atmospheres may be present	1. Air inside the tank must be monitored prior to entry and continuously during CSE work for O2 and LEL to ensure flammable atmospheres do not exist. 2. 4 gas meter will be calibrated daily and calibration documented. 3. Entry into tank is not permitted if outside of the following limits: 4. LEL must be less than 10 % 5. Exit the tank if the above levels are exceeded. 6. Ventilate space. 7. Do not re-enter space unless the levels above are met. 8. Only non-sparking tools and intrinsically safe communication or lighting devices inside tanks. 9. Keep a minimum 10A:60BC fire extinguisher in the support zone work area (within 25 feet of work area).	M
	Toxic vapors could expose workers to toxic chemicals.	1. Air inside the tank must be monitored prior to entry for O2, LEL, H2S, and CO as identified above. 2. A PID will be used to monitor the space and breathing zone of workers to help ensure that potential exposures remain below the PEL and that level of respiratory protection is sufficient. The APP will be followed for industrial hygiene strategy during monitoring. 3. PID will be calibrated daily and calibration documented. 4. Results of monitoring will be used by CSE supervisor and SHM to determine if respiratory protection is required during CSE work. 5. If respiratory protection is required, workers will wear full face air purifying respirators with organic vapor/P-100 cartridges. Full skin protection is required as the tank previously contained a chemicals that can cause damage to skin. (See MSDS for Tri-ACT) 6. Workers will be fit-tested and medically qualified to wear respirator.	M
	While working inside tanks workers could be exposed to contaminants by skin contact	1. For potential chemical exposures to skin, wear a minimum of PVC raingear or polyethylene-coated Tyvek coveralls, steel toe or equivalent boots with PVC covers, Nitrile gloves, safety goggles (unless wearing full face respirator).	M

<b>AHA 4 – Job/Task: Confined Space Entry (includes rivet busting and AST tank cleanout)</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
		2. Upon exit from tank, remove PPE properly, undergo decontamination as required, and wash hands before exiting the CRZ.	
	Emergencies where entrant could not exit tank on their own creating possible medical emergency or injury	<ol style="list-style-type: none"> <li>1. A tripod, harness, and retrieval system will be set up at the entry/exit point for rescue purposes (applicable for entry from the top of tank only).</li> <li>2. CSE team will be trained in rescue procedures and use of rescue equipment.</li> <li>3. Entrant will be secured with harness and retrieval line prior to entry. - CSE team will have access to communications with each other as well as for offsite notification for emergencies.</li> <li>4. Hospital route map and emergency contact list will be onsite and available.</li> <li>5. A minimum of two first aid/CPR trained personnel will be available onsite.</li> <li>6. First aid/CPR qualified personnel to be qualified and identified.</li> </ol>	M
	<ol style="list-style-type: none"> <li>a. Lack of proper illumination</li> <li>b. Water spray during cleaning could fog goggles or respirator</li> </ol>	<ol style="list-style-type: none"> <li>a. <ol style="list-style-type: none"> <li>1. Portable (intrinsically safe) lighting may be necessary if ambient lighting is not sufficient to minimum of 55 lx.</li> <li>2. Refer to EM 385-1-1, Table 7-1.</li> </ol> </li> <li>b. <ol style="list-style-type: none"> <li>1. Worker in tank will have a means of wiping goggles or respirator facepiece to maintain visibility.</li> <li>2. Do not remove respirator or goggles to clean them while inside tank.</li> </ol> </li> </ol>	M
	Lack of effective communication of CSE team (during noisy tasks and tasks out of view of attendant)	<ol style="list-style-type: none"> <li>1. Ensure that the CSE team is in place.</li> <li>2. Know hand signals that are used to indicate stop and start vacuum hoses or water supply. –</li> <li>3. Ensure entrant is prepared and gives signal for start and stop.</li> </ol>	M
	Heat or cold stress potential	<ol style="list-style-type: none"> <li>1. Properly dress for the weather and wear layers as necessary.</li> <li>2. SSHO to monitor implement heat or cold stress controls as specified in the APP.</li> <li>3. Provide breaks for personnel to get either into cool or warm environment.</li> <li>4. Encourage a steady work pace.</li> <li>5. Ensure adequate drinking water is available.</li> <li>6. Know the signs and symptoms of exposure and keep an eye on your partner.</li> <li>7. SSHO to implement TtEC EHS 4-6 Procedure, Temperature Extremes.</li> </ol>	M

<b>AHA 4 – Job/Task: Confined Space Entry (includes rivet busting and AST tank cleanout)</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
	Head injuries inside tank (small space, could bump head on sides or top of tank)	1. Entrant shall wear hard hat when working inside tank.	L

<b>AHA 4 - Job/Task: Confined Space Entry (includes rivet busting and AST tank cleanout)</b>		
<b>Equipment to be Used</b>	<b>Training Requirements/Competent or Qualified Personnel name(s)</b>	<b>Inspection Requirements</b>
Site vehicles	- Drivers must have state authorized driver's license.	<ul style="list-style-type: none"> <li>• Receipt inspection by SS</li> <li>• Daily vehicle inspection by drivers.</li> </ul>
Vacuum truck	- Operators will be qualified and experienced operators for use of the equipment they operate	<ul style="list-style-type: none"> <li>• Receipt inspection by SS</li> <li>• Daily inspection by operator.</li> </ul>
Hand and power tools: <ul style="list-style-type: none"> <li>• Power drummer (pump and generator);</li> <li>• Compressor</li> <li>• Pneumatic rivet busting device)</li> <li>• Hand tools such as bung wrench (others as required)</li> </ul>	-Training in use of hand and power tools by the SSHO or designee and review of operating manual.  -Use proper hand tool for the task.	<ul style="list-style-type: none"> <li>• Daily inspection by users/operators.</li> <li>• Maintenance as per manufacturer recommendation</li> </ul>
PPE: <ul style="list-style-type: none"> <li>• Safety glasses or goggles</li> <li>• Hard hat</li> <li>• High-visibility safety vest</li> <li>• Safety-toe boots,</li> <li>• Hearing protection</li> <li>• Leather work gloves</li> <li>• Nitrile gloves</li> <li>• PVC over-boots</li> <li>• PVC raingear or polyethylene-coated Tyvek</li> <li>• Full-face air purifying respirator with organic vapor/P100 cartridges)</li> </ul>	-Personnel will have had this training as part of their HAZWOPER and CSE training.	<ul style="list-style-type: none"> <li>• Inspect PPE before donning.</li> <li>• Look for tears, puncture or damage.</li> <li>• Discard and replace those items that are damaged.</li> </ul>
Industrial hygiene monitoring equipment: <ul style="list-style-type: none"> <li>• 4-gas meter with O<sub>2</sub>, LEL, CO and H<sub>2</sub>S sensors</li> <li>• PID with 10.6eV lamp</li> </ul>	-Personnel, SSHO and CSE Supervisor must be familiar with use/limitations of the monitoring equipment, calibration procedures, and industrial hygiene strategy.	4-gas meter: <ul style="list-style-type: none"> <li>• Calibration and function checks by qualified user (CSE Supervisor) before use.</li> <li>• Manufacturer's recommended servicing and</li> </ul>

<b>AHA 4 - Job/Task: Confined Space Entry (includes rivet busting and AST tank cleanout)</b>		
<b>Equipment to be Used</b>	<b>Training Requirements/Competent or Qualified Personnel name(s)</b>	<b>Inspection Requirements</b>
		maintenance. PID: <ul style="list-style-type: none"> <li>• Calibration and function check by qualified user (CSE Supervisor) before use.</li> <li>• Manufacturer's recommended servicing and maintenance.</li> </ul>
First aid kit, fire extinguisher, eyewash station	- Use of emergency equipment including first aid kits, fire extinguishers and eyewash must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Fire Extinguisher <ul style="list-style-type: none"> <li>• Initially and at least monthly thereafter by SSHO</li> </ul> First Aid Kit <ul style="list-style-type: none"> <li>• Weekly and after use for restocking by SSHO.</li> </ul> Eye Wash Station <ul style="list-style-type: none"> <li>• Weekly by SSHO</li> <li>• Potable water changed weekly unless a preservative solution is used</li> </ul>
CSE rescue equipment: <ul style="list-style-type: none"> <li>• Tripod</li> <li>• Harness</li> <li>• Retrieval system</li> </ul>	-Personnel must be familiar with and have training in proper use of rescue equipment as part of CSE training course. - Practice drill on each confined space that is entered or planned to be entered.	<ul style="list-style-type: none"> <li>• Daily inspection by CSE Supervisor</li> </ul>
Spill kit: <ul style="list-style-type: none"> <li>• Sorbent pads</li> <li>• Kitty Litter</li> <li>• Waste bags</li> </ul>	- Personnel must be familiar with and have training in proper use of spill cleanup material at first responder level only. - Personnel will wear PPE as described for drum handling tasks in this AHA.	<ul style="list-style-type: none"> <li>• Spill kits will be inspected at least monthly by the SSHO</li> <li>• Restock after use.</li> </ul>
Ladder:	- Personnel must be familiar with proper ladder use.	<ul style="list-style-type: none"> <li>• Ladder will be inspected prior to use</li> </ul>

**Abbreviations and Acronyms:**

AHA – Activity Hazard Analysis  
 APP – Accident Prevention Plan  
 CO – carbon monoxide  
 CRZ – contamination reduction zone  
 CSE – Confined Space Entry  
 dBA – decibels (A- weighted)  
 EHS – environmental health and safety  
 EM – Engineer Manual  
 eV – electron volt

H<sub>2</sub>S – hydrogen sulfide  
 LEL – lower explosive limit  
 O<sub>2</sub> – oxygen  
 PEL – permissible exposure limit  
 PID – photoionization detector  
 PPE – personal protective equipment  
 ppm – parts per million  
 PVC – polyvinyl chloride  
 RAC – Risk Assessment Code

SHM – Safety and Health Manager  
 SS – Site Superintendent  
 SSHO – Site Safety and Health Officer  
 TBD – To be determined

**AHA Signature Sheet**

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

NAME	SIGNATURE	TITLE	DATE
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

## Activity Hazard Analysis (AHA) #5

<b>Activity/Work Task: Waste Management</b>	<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>	<b>M</b>
Project Location: Various AST Sites, Camp Lejeune Marine Corps Base , Jacksonville, NC	<b>Risk Assessment Code (RAC) Matrix</b>	
Contract Number: N62470-13-D-8007	<b>Severity</b>	<b>Probability</b>
Date Prepared: August 2014		Frequent    Likely    Occasional    Seldom    Unlikely
Prepared by: Christine Joblon, Senior Scientist	Catastrophic	<b>E</b> <b>E</b> <b>H</b> <b>H</b> <b>M</b>
	Critical	<b>E</b> <b>H</b> <b>H</b> <b>M</b> <b>L</b>
Reviewed by: Roger Margotto, CIH,CSP, CHMM, Program SHM	Marginal	<b>H</b> <b>M</b> <b>M</b> <b>L</b> <b>L</b>
	Negligible	<b>M</b> <b>L</b> <b>L</b> <b>L</b> <b>L</b>
<p><b>Notes:</b> (Field Notes, Review Comments, etc.)</p> <p>In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.</p> <p style="color: red;">Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated, High visibility safety vest.</p>	Step 1: Review each “ <b>Hazard</b> ” with identified safety “ <b>Controls</b> ” and determine RAC (see above).	
	“ <b>Probability</b> ” is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.	<b>RAC Chart</b>
	“ <b>Severity</b> ” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.	<b>E = Extremely High Risk</b>
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on the AHA. Annotate the overall highest RAC at the top of the AHA.	<b>H = High Risk</b>
		<b>M = Moderate Risk</b>
		<b>L = Low Risk</b>

<b>AHA #5 – Activity/Work Task: Waste Management</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
Load out of waste	Construction equipment could cause injury to personnel.	Wear high-visibility safety vests when exposed to vehicular traffic. Exit equipment slowly and maintain three point contact. Review and follow hand signals provided in SSHP Table 10.1. Workers operating construction equipment will be qualified and designated operators. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt while seated. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed. Workers working around construction equipment will stay out of the swing radius and to enter the swing radius, must make contact with the operator and have operator acknowledgment prior to entry. Only personnel necessary to perform work tasks will be in controlled work zones around heavy equipment and must remain visible to the operator. Operator's manual required for each piece of equipment.	M
	Slips/trips/falls	Clear walkways and work areas of equipment, tools, and debris, mark or barricade other obstructions. Clean mud from boots before climbing on equipment.	M
	High noise levels	Use hearing protection when exposed to excessive noise level (greater than 85 dBA over an 8-hour work period). Assess noise level with sound level meter if possibility exists that noise level may exceed 85dBA.	L
	Defective vehicles could cause injury to personnel and/or damage equipment	Inspect all trucks before loading. Do not load waste or equipment into defective equipment. Ensure trucks are lined and covered during transport.	M
	Contact with overhead utilities could cause injury to workers and damage to property or equipment.	Ensure that the area has been surveyed and that the boom will not contact overhead lines while loading truck (minimum 15-foot clearance required).	M
	Biological hazards such as snakes, insects, or spiders could cause injury or bites.	Wear PPE. Look carefully for snakes before stepping into any area or before placing hands near the ground. Watch out for snakes when disturbing rubble or debris. Use insect repellent as necessary. Use care around debris and locations where spiders, especially black widow spiders, may be found (such as tall vegetation, out houses and so forth).	L
	Roadways may fail under excessive loads	Ensure roadways on truck routes are designed to handle the weight of the vehicles and materials. Ensure transporters follow approved traffic routes while on Base.	M

<b>AHA #5 – Activity/Work Task: Waste Management</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
Subcontractors working onsite	Lack of subcontractor understanding of TtEC safety policies could cause injury to personnel and/or equipment damage	Ensure that subcontractors are briefed on relevant safety policies. Ensure subcontractors are following safe practices. If unsafe activities are observed, stop work and correct immediately.	M

<b>AHA #6 – Activity/Work Task: Waste Management</b>		
<b>Equipment to be Used</b>	<b>Training Requirements/Competent or Qualified Personnel Name(s)</b>	<b>Inspection Requirements</b>
Site vehicles	Drivers must have current state-issued driver’s license.	Daily vehicle inspection by drivers. Receipt inspection by SS.
Heavy Equipment	Operators will be qualified and experienced operators for use of the equipment they operate	Receipt inspection by SS. Daily inspection by operator.
Fire extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking. Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used

- Abbreviations and Acronyms:**  
 APP – Accident Prevention Plan  
 CHMM – Certified Hazardous Materials Manager  
 CIH – Certified Industrial Hygienist  
 CSP – Certified Safety Professional  
 dBA – decibels, A-scale  
 PPE - personal protective equipment  
 SHM – Safety and Health Manager  
 SSHO – Site Safety and Health Officer  
 SS – Site Superintendent  
 TtEC – Tetra Tech EC, Inc.

**AHA Signature Sheet**

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

NAME	SIGNATURE	TITLE	DATE
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## Activity Hazard Analysis (AHA) #6

<b>Activity/Work Task: Site Restoration</b>	<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>	<b>M</b>
Project Location: Various AST Sites, Camp Lejeune Marine Corps Base , Jacksonville, NC	<b>Risk Assessment Code (RAC) Matrix</b>	
Contract Number: N62470-13-D-8007	<b>Severity</b>	<b>Probability</b>
Date Prepared: August 2014		Frequent    Likely    Occasional    Seldom    Unlikely
Prepared by: Christine Joblon, Senior Scientist	Catastrophic	<b>E</b> <b>E</b> <b>H</b> <b>H</b> <b>M</b>
	Critical	<b>E</b> <b>H</b> <b>H</b> <b>M</b> <b>L</b>
Reviewed by: Roger Margotto, CIH, CSP, CHMM, Program SHM	Marginal	<b>H</b> <b>M</b> <b>M</b> <b>L</b> <b>L</b>
	Negligible	<b>M</b> <b>L</b> <b>L</b> <b>L</b> <b>L</b>
<p><b>Notes:</b> (Field Notes, Review Comments, etc.)</p> <p>In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.</p> <p style="color: red;">Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated, High visibility safety vest.</p>	Step 1: Review each “ <b>Hazard</b> ” with identified safety “ <b>Controls</b> ” and determine RAC (see above).	
	“ <b>Probability</b> ” is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.	<b>RAC Chart</b>
	“ <b>Severity</b> ” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.	<b>E = Extremely High Risk</b>
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on the AHA. Annotate the overall highest RAC at the top of the AHA.	<b>H = High Risk</b>
		<b>M = Moderate Risk</b>
		<b>L = Low Risk</b>

<b>AHA #6 – Activity/Work Task: Site Restoration</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
Backfill of clean soil	Hazards associated with incoming soil trucks that could cause equipment damage or personnel injury.	Ensure subcontractors abide by TtEC safety procedures. Follow posted speed limits, follow approved truck routes, use a spotter when backing, lower truck bed before moving, unload truck on level ground, and keep personnel out of the area when soil is being placed.	M
	Construction equipment could cause injury to personnel.	Wear high visibility vests when exposed to vehicular traffic. Exit equipment slowly and maintain three point contact. Review and follow hand signals provided in SSHP Table 10.1. Workers operating construction equipment will be qualified and designated operators. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt while seated. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed. Workers working around construction equipment will make contact with the operator and have operator acknowledgment prior to approaching. Only personnel necessary to perform work tasks will be in controlled work zones around heavy equipment and must remain visible to the operator. Operator's manual required for each piece of equipment.	M
Grading	Construction equipment could cause injury to personnel.	Wear high visibility safety vests when exposed to vehicular traffic. Exit equipment slowly and maintain three point contact. Review and follow hand signals provided in SSHP Table 10.1. Workers operating construction equipment will be qualified and designated operators. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt while seated. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed. Workers working around construction equipment will make contact with the operator and have operator acknowledgment prior to approaching. Only personnel necessary to perform work tasks will be in controlled work zones around heavy equipment and must remain visible to the operator. Operator's manual required for each piece of equipment.	M
Applying seed, soil amendments, and straw	Heavy lifting (straw bales, seed bags)	Do not lift more than 50 lb per person. Ask for help when lifting items greater than 50 lbs or awkward items.	M
	Inhalation of dusts when spreading lime may cause irritation to the respiratory system	Use pelletized lime when possible. Stay upwind of material when applying. Wear dust mask, if necessary.	L
	Exposure to lime dust may cause irritation of the eyes /skin	Wear safety glasses or goggles and protective gloves. Stand upwind of material when placing. Avoid rubbing eyes after handling product. Wear long sleeve shirts.	L

<b>AHA #6 – Activity/Work Task: Site Restoration</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
Applying seed, soil amendments, and straw (continued)	Biological hazards such as snakes, insects, or spiders (found in straw bales) could cause injury or bites.	Inspect straw bales for rodents/snakes prior to handling. Be sure to wear protective gloves.	L
	Slips/trips/falls	Clear walkways and work areas of equipment, tools, and debris, mark or barricade other obstructions. Clean mud from boots before climbing on equipment.	M
Removal of erosion controls (silt fence)	Manual removal may cause injury to workers	Remove using heavy equipment in lieu of manual removal to avoid unnecessary strain.	M
	Slips/trips/falls	Clear walkways and work areas of equipment, tools, and debris, mark or barricade other obstructions. Clean mud from boots before climbing on equipment.	M
	Construction equipment could cause injury to personnel.	Wear high visibility vests when exposed to vehicular traffic. Exit equipment slowly and maintain three point contact. Review and follow hand signals provided in SSHP Table 10.1. Workers operating construction equipment will be qualified and designated operators. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt while seated. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed. Workers working around construction equipment will make contact with the operator and have operator acknowledgment prior to approaching. Only personnel necessary to perform work tasks will be in controlled work zones around heavy equipment and must remain visible to the operator. Operator's manual required for each piece of equipment.	M
	Slips/trips/falls	Clear walkways and work areas of equipment, tools, and debris, mark or barricade other obstructions. Clean mud from boots before climbing on equipment.	M
	Contact with overhead utilities could cause injury to workers and damage to property or equipment.	Ensure that the area has been surveyed and that the boom will not contact overhead lines while loading truck (minimum 15-foot clearance required).	M
	Biological hazards such as snakes, insects, or spiders could cause injury or bites.	Wear PPE. Look carefully for snakes before stepping into any area or before placing hands near the ground. Watch out for snakes when disturbing rubble or debris. Use insect repellent as necessary. Use care around debris and locations where spiders, especially black widow spiders, may be found (such as tall vegetation, out houses and so forth).	L

<b>AHA #6 – Activity/Work Task: Site Restoration</b>		
<b>Equipment to be Used</b>	<b>Training Requirements/Competent or Qualified Personnel Name(s)</b>	<b>Inspection Requirements</b>
Site vehicles	Drivers must have current state-issued driver’s license.	Daily vehicle inspection by drivers. Receipt inspection by SS.
Heavy Equipment	Operators will be qualified and experienced operators for use of the equipment they operate	Receipt inspection by SS. Daily inspection by operator.
Fire extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking. Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used

**Abbreviations and Acronyms:**

- APP – Accident Prevention Plan
- CHMM – Certified Hazardous Materials Manager
- CIH – Certified Industrial Hygienist
- CSP – Certified Safety Professional
- PPE- personal protective equipment
- SHM – Safety and Health Manager
- SSHO – Site Safety and Health Officer
- SS – Site Superintendent
- TtEC – Tetra Tech EC, Inc.

**AHA Signature Sheet**

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

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## Activity Hazard Analysis (AHA) #7

<b>Activity/Work Task: Demobilization</b>	<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>	<b>M</b>					
Project Location: Various AST Sites, Camp Lejeune Marine Corps Base , Jacksonville, NC	<b>Risk Assessment Code (RAC) Matrix</b>						
Contract Number: N62470-13-D-8007	<b>Severity</b>	<b>Probability</b>					
Date Prepared: August 2014		Frequent	Likely	Occasional	Seldom	Unlikely	
Prepared by: Christine Joblon, Senior Scientist	Catastrophic	E	E	H	H	M	
	Critical	E	H	H	M	L	
Reviewed by: Roger Margotto CIH,CSP,CHMM Program SHM	Marginal	H	M	M	L	L	
	Negligible	M	L	L	L	L	
<p><b>Notes:</b> (Field Notes, Review Comments, etc.)</p> <p>In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.</p> <p style="color: red;">Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated, High visibility safety vest.</p>	Step 1: Review each “ <b>Hazard</b> ” with identified safety “ <b>Controls</b> ” and determine RAC (see above).		<b>RAC Chart</b>				
	“ <b>Probability</b> ” is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.						
	“ <b>Severity</b> ” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.						
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on the AHA. Annotate the overall highest RAC at the top of the AHA.						
		<b>E = Extremely High Risk</b>					
		<b>H = High Risk</b>					
		<b>M = Moderate Risk</b>					
		<b>L = Low Risk</b>					

<b>AHA #7 – Activity/Work Task: Demobilization</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
Removal/demobilization of equipment, materials, and personnel	Failure to use spotters when loading equipment onto trucks for transportation could cause equipment to strike the truck.	Use spotters. Use a tag line. Slowly lower the equipment.	M
	Failure to perform proper hoisting/rigging techniques (if performed during this task) could cause injury to personnel.	Refer to AHA 8 – Hoisting and Rigging, which will be followed in addition to this AHA.	M
	Unsafe vehicle operations could cause injury to personnel or others onsite	Workers operating company or subcontractor vehicles will have a valid state issued driver’s license. Any Commercial Driver’s License (CDL) truck and trailers will be operated by CDL qualified drivers. All personnel and trucks will have Base badges following Base procedures. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt while seated. Use parking brake when parked. Use chocks when parked on inclines. Use dedicated spotter and standard hand signals for backing operations. Wear high visibility vest when working around operating vehicle traffic. Coordinate with other site tenants as required to identify travel and traffic patterns and to delineate work areas. Follow designated traffic routes, as indicated in the traffic plan.	M
	Construction equipment could cause injury to personnel	Workers operating construction equipment will be qualified and designated operators. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt while seated. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed.	M
	Ergonomic hazards such as sprains, strains, or back injury from lifting or repetitive actions	Use mechanical lifting equipment or team lift when possible rather than by hand and tool methods. Do not bend at the waist, bend at the knees. Do not twist at the waist nor turn while lifting. Keep the load centered and close to body. Do not lift more than 50 pounds. Rotate tasks and take breaks when performing repetitive tasks and try to find the best position possible to perform the task.	M
	Slips, trips, and falls could lead to injuries	Keep work areas free of debris and equipment in work paths. Be alert of surroundings and watch footing.	M
	Cold or heat stress and weather hazards	Properly dress for the weather. SSHO to monitor weather and implement heat stress and cold stress controls as specified in the APP. Provide breaks for personnel to get either into cool or warm environment. Encourage a steady work pace. Ensure adequate drinking water is available. Know the signs and symptoms of exposure and keep an eye on your partner. SSHO to implement EHS 4-6, Temperature Extremes.	M

<b>AHA #7 – Activity/Work Task: Demobilization</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
Removal/demobilization of equipment, materials, and personnel (continued)	Noise could cause hearing loss and make it hard to communicate	Hearing protection is required when sound levels exceed 84 dBA continuously. This rule applies to personnel working near or on heavy equipment and any other sources of loud noise.	M
	Poisonous snakes	Watch for snakes and know how to identify ones that could be venomous. Keep hands and other body parts from placement into burrows, debris piles, or under objects or debris. Review procedures to follow in the event of a snake bite as are included in the APP.	L
	Contact with biting or stinging insects	Workers will apply DEET to work clothing following manufacturer's instructions as a preventative measure for biting insects as required. Workers with allergies will let the SSHO know using the medical data sheet and will carry their own prescription medication as applicable. First aid and medical attention to be performed, as required.	L
	Workers could be injured by high winds of sudden storms.	Ensure that all debris/materials are secured. Shut down operations when wind speed is greater than 25 mph sustained or lesser based on potential hazards (e.g., tree limbs could fall) or lightning within 10 miles. Monitor the local weather report daily and as necessary for any severe weather warnings. Know the procedures to follow in the event of severe weather emergencies. Have a lightning detector on hand.	M
	Workers could be exposed to extreme temperatures and sunburn.	Monitor for heat or cold stress in accordance with EHS 4-6, Temperature Extremes. Provide fluids and rest breaks during warm weather and while wearing heavier clothing. Wear broad-spectrum sunscreen lotion with an SPF of 15 or greater.	M
	Lack of effective communication could lead to a delayed response in an emergency.	Ensure that each work team has a cellular telephone for emergency communication. A work team may substitute a 2-way radio for a cellular phone if the other radio party has access to a phone. If more than one team at a time is working, ensure that there is communication between the work teams and project management. Use the buddy system. Test the communication systems in use to ensure they function properly. Post the emergency plan in the SZ, with emergency contact list.	M
	Exposure to poison ivy or oak.	As area is inspected, identify any "suspicious" vegetation that may be poison oak. Mark these areas with warning tape or spray paint in preparation for vegetation clearance. Avoid contact with these plants. Wear long sleeve shirts and pants. Wear disposable gloves. Wear an "ivy blocker" and have Technu® or Zanfel post-exposure washing agent available.  These plants need to be removed carefully to avoid spreading vegetation throughout the site or spraying plant debris on personnel or equipment. Also cutting tools that cut this vegetation need to be cleaned and handled carefully as	M

<b>AHA #7 – Activity/Work Task: Demobilization</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
Removal/demobilization of equipment, materials, and personnel (continued)		the oils can remain on cutting surfaces. Never burn plants. Refer to Health and Safety Guideline (HSG) 2-8 in the CRL for details.	
	Failure to observe and prepare for encounter with insects, rodents, or snakes could cause injury to worker.	Observe for insects, rodents, and snakes. Use a “tapping” stick, if necessary, in any brush area to flush out or expose snakes before walking in brushy areas. Wear snake chaps (gaiters). Apply DEET as necessary. Avoid placing hands in concealed areas. Wear protective gloves. Use tools wherever possible to dislodge objects first, before placing hands low to ground to move objects.	M
	Movement of heavy material or frequent bending over to pick up debris may cause back strain.	Direct personnel to use proper lifting techniques, such as keeping the back straight, lifting with the legs without twisting, and getting help when moving bulky/heavy materials and equipment. Encourage the use of lifting equipment and use of a hand-truck whenever possible. Employees will not lift more than 50 pounds alone. Encourage a steady, sustainable work pace. Take breaks and rotate the work to avoid repetitive stress to the back.	M
	Refueling of equipment could cause fires or spills.	Ensure saws are turned off and allowed to cool before being refueled. Do not overfill saws by ensuring a small size fuel can is used which the worker can maintain good control over during refueling. Place equipment on a spill pad for refueling. Visually inspect refueling point to ensure overfill is not done. Do not fill to capacity; leave space for expansion in the tank.  Do not smoke in or near refueling areas. Do not refuel in back of a pickup truck. Have a fire extinguisher present at the refueling site and ensure workers are trained in their use.	L
	Workers could be exposed to extreme temperatures and sunburn.	Monitor for heat or cold stress in accordance with EHS 4-6, Temperature Extremes. Provide fluids and rest breaks during warm weather, and while wearing protective clothing. Wear broad-spectrum sunscreen lotion of SPF 15 or better.	M
	Lack of communication could lead to a delayed response in an emergency.	Ensure that each work team has a cellular telephone, or access to a cellular telephone, for emergency communication. A work team may substitute a 2-way radio for a cellular phone if the other radio party has access to a phone. If more than one team at a time is working, ensure that there is communication between the work teams and project management. Use the buddy system.	M

<b>AHA #7 – Activity/Work Task: Demobilization</b>		
<b>Equipment to be Used</b>	<b>Training Requirements/Competent or Qualified Personnel Name(s)</b>	<b>Inspection Requirements</b>
Site vehicles	Drivers must have current state-issued driver’s license.	Daily vehicle inspection by drivers. Receipt inspection by SS.
Heavy Equipment	Operators will be qualified and experienced operators for use of the equipment they operate	Receipt inspection by SS. Daily inspection by operator.
Hand and power tools	Training in use of hand and power tools by the SSHO or designee and review of operating manual. Use proper hand tool for the task.	Daily inspection by users/operators.
Fire extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking. Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used
Industrial hygiene monitoring equipment	SSHO must be familiar with use/limitations of the monitoring equipment, calibration procedures, and industrial hygiene strategy.	Calibration and function checks before use.

**Abbreviations and Acronyms:**

- APP – Accident Prevention Plan
- CHMM – Certified Hazardous Materials Manager
- CIH – Certified Industrial Hygienist
- CSP – Certified Safety Professional
- DEET – N,N-diethyl –m-toluamide
- EHS – Environmental, Health, and Safety
- SHM – Safety and Health Manager
- SSHO – Site Safety and Health Officer
- SS – Site Superintendent

**AHA Signature Sheet**

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

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## Activity Hazard Analysis (AHA) # 8

<b>Activity/Work Task: Hoisting and Rigging</b>	<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>	<b>M</b>
Project Location: Various AST Sites, Camp Lejeune Marine Corps Base , Jacksonville, NC	<b>Risk Assessment Code (RAC) Matrix</b>	
Contract Number: N62470-13-D-8007	<b>Severity</b>	<b>Probability</b>
Date Prepared: August 2014		Frequent    Likely    Occasional    Seldom    Unlikely
Prepared by: Christine Joblon, Senior Scientist	Catastrophic	<b>E</b> <b>E</b> <b>H</b> <b>H</b> <b>M</b>
	Critical	<b>E</b> <b>H</b> <b>H</b> <b>M</b> <b>L</b>
Reviewed by: Roger Margotto, CIH, CSP, CHMM, Safety and Health Manager (SHM)	Marginal	<b>H</b> <b>M</b> <b>M</b> <b>L</b> <b>L</b>
	Negligible	<b>M</b> <b>L</b> <b>L</b> <b>L</b> <b>L</b>
<p><b>Notes:</b> (Field Notes, Review Comments, etc.)</p> <p>In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.</p> <p style="color: red;">Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated, High visibility safety vest. Additional PPE as specified below.</p>	Step 1: Review each “ <b>Hazard</b> ” with identified safety “ <b>Controls</b> ” and determine RAC (see above).	
	“ <b>Probability</b> ” is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.	<b>RAC Chart</b>
	“ <b>Severity</b> ” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.	<b>E = Extremely High Risk</b>
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on the AHA. Annotate the overall highest RAC at the top of the AHA.	<b>H = High Risk</b>
		<b>M = Moderate Risk</b>
	<b>L = Low Risk</b>	

<b>AHA # 8 – Activity/Work Task: Hoisting and Rigging</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
Operation of heavy equipment, general	Construction equipment could cause injury to personnel	Workers operating construction equipment will be qualified and designated operators. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt while seated. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed. Workers working around construction equipment will stay out of the swing radius and to enter the swing radius, must make contact with the operator and have operator acknowledgement prior to entry. Only personnel necessary to perform work tasks will be in controlled work zones around heavy equipment and must remain visible to the operator.	M
General Precautions	Task hazards and general precautions on use of this AHA.	Refer to AHAs for work tasks in which hoisting and rigging will be performed as part of that task (e.g., mobilization and site setup and headwall and pipe removal). Materials being hoisted and the hazards will vary based on what is being lifted and where it is being placed. All hoists and all rigging situations will be unique and must be properly evaluated by the Competent Person (TBD) and the operator of the heavy equipment being used. Tasks in which hoisting and rigging may be performed may include mobilization and demobilization, drum handling, placement of trench boxes, etc. All these tasks have unique hazards to consider. This AHA addresses general precautions for performing hoisting and rigging tasks.	M
	Slips, trips, and falls	Clear area to be worked in of loose debris and trip hazards. Ensure a travel path for rigging team.	
	Heavy lifting and awkward positions	Team-lift or use material handling devices as required. Use good posture when lifting or moving materials. Do not self-lift more than 50 pounds alone. Avoid jerking movements or rotating while walking.	
Rigging and hoisting operations Rigging and hoisting operations (continued)	Improper hoisting and rigging experience and training could result in injuries to workers or equipment damage	The hoisting and rigging competent person, (TBD) will oversee all use of rigging and all hoisting operations performed onsite on a task specific basis. Persons performing equipment operation and rigging tasks will have written proof of qualifications for these tasks. The subcontractor, when required, will provide a qualified rigger to perform the rigging within the EZ when required. This person, when name becomes known, will be added to this AHA as a competent person.	M

<b>AHA # 8 – Activity/Work Task: Hoisting and Rigging</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
	Improper stability of equipment or swing radius could cause equipment failure or damage	The operator will ensure that adequate swing radius for equipment, rigging, and load is established prior to performing the pick. The ground under the hydraulic excavating equipment will be stable and verified sufficient for equipment and load stability. Load charts will be consulted for the lift as applicable.	M
	Failure of rigging or equipment used to perform the hoist could result in injury or equipment damage	Operational testing will be performed as required by EM 385 1-1 Section 16.S.03.b. This testing will be documented by the competent person. More than one test may be required depending upon the materials being hoisted and the rigging being used. All equipment used for hoisting will meet the manufacturer’s guidelines for use in performing hoisting tasks (or the equipment will not be used for this purpose). All operating procedures will be per the manufacturer’s operating manual, including load rating capacities and charts if required. No hoisting or rigging tasks will be done that constitute a critical lift. If load capacity is within 20% of capacity, a larger piece of equipment or another means of lifting will be provided. Never allow persons to be positioned under a suspended load.	
	Improper or damaged rigging could cause injury or loss of load	Only positive latching devices will be used to secure the load and rigging. All rigging used to perform the hoist will be inspected by the competent person to ensure it is properly rated, is in good condition, and is properly configured for the lift. Taglines will be used to control the load being hoisted and moved as necessary to control the load movement.	
	Setting up of rigging could lead to cause pinch points, cuts, or scrapes	Ensure neutral configuration of rigging and slack in rigging before attaching straps. Ensure communication with operator before attaching rigging so that boom and bucket on excavator are not engaged. Wear leather work gloves. Watch out when running hands underneath or on equipment or materials due to sharp edges or pinch points. Wear leather work gloves when handling rigging and materials.	M
	Improper communications and planning could lead to confusion and errors in the pick	The rigger and the operator will be in visual and verbal communication. Standard and recognized hand signals will be used for communication. Rigger and operator to verify that non-involved persons are clear of the load (not underneath or in swing radius). Lift will not occur until rigger notifies operator to do so.	

<b>AHA # 8 – Activity/Work Task: Hoisting and Rigging</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
Rigging and hoisting operations (continued)	Release of rigging could lead to cause pinch points	Ensure neutral configuration of rigging and slack in rigging before releasing straps. Ensure communication with operator before removing rigging so that boom and bucket on excavator are not engaged. Wear leather work gloves.	

<b>AHA # 8 – Activity/Work Task: Hoisting and Rigging</b>		
<b>Equipment to be Used</b>	<b>Training Requirements/Competent or Qualified Personnel Name(s)</b>	<b>Inspection Requirements</b>
Excavator or loader (equipped properly for attachment of rigging)	Trained and experienced operators will operate heavy equipment.	Receipt inspection by SS. Daily inspection by users/operators. Task observation of operators by SS. Ensure equipment meets manufacturer's guidelines for performing hoisting. Have copy of manufacturer's operation manual onsite.
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking.
Hoisting and Rigging Equipment	Competent person (TBD) is responsible for hoisting and rigging	Initial and before use inspection of equipment and material used for hoisting and rigging, operational testing of the equipment and material.

**Abbreviations and Acronyms:**  
 APP – Accident Prevention Plan  
 EZ – Exclusion Zone  
 SSHO – Site Safety and Health Officer  
 SS – Site Superintendent  
 PPE – Personal Protective Equipment  
 TBD – To be determined

**AHA Signature Sheet**

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

NAME	SIGNATURE	TITLE	DATE
1.			
2.			
3.			
4.			
5.			
6.			
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8.			
9.			
10.			

**APPENDIX B**  
**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 C**  
**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

'.

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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®', '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

Place Your Link in this Column

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**



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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>Version Date - Type:</b>	12/09/2009 - Revised	<b>Title:</b>	Event Reporting and Investigation
<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/Environmental H&S, EHS Compliance/Spill Reporting, Field Activities/Science, Operational Control, Training, EHS Compliance/Permits, Nonconformance and Corrective and Preventive Action	<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 program is to:

- a. Specify the types of events to be reported and investigated, including both safety and quality-related events.
- b. Define internal Tetra Tech EC, Inc. (TtEC) and external event notification requirements.
- c. Ensure proper management and follow-up of each event.

- d. Meet regulatory notification and investigation requirements.
- e. Provide a mechanism to identify Environmental, Safety and Quality (ESQ) issues and areas for improvement and recognize job well done through the Zero Incident Performance® (ZIP) Slip.

## **2.0 SCOPE**

Event reporting requirements apply to all operations of TtEC and its subsidiaries (the "Company"), including subcontractor activities. The term "Event Reports" in this procedure encompasses Quality Event Reports (QERs), Near Miss, and EHS Event Reports.

## **3.0 MINIMUM REQUIREMENTS**

### **3.1 Responsibilities**

#### **3.1.1 All Personnel**

All personnel shall immediately report any event (see Section 4.1.1) to their supervisor. The report can be verbal or in writing.

Employees, including subcontractors, are required to participate in the investigation process as directed, and comply with corrective actions identified. Employees are also made aware of trends and may be asked to help develop lessons learned to prevent similar events from occurring.

#### **3.1.2 Line Management**

Line Management, including the Office Manager for office events and the Project Manager (PM) for project events shall:

- a. Be responsible for all client notifications - (Prior to initiation of project field activities, the Project Manager shall coordinate with the client to determine the appropriate agency notification responsibilities and procedures).
- b. Implement the appropriate internal notifications (see Table 1) as required by this program as soon as an event becomes known.
- c. The supervisor responsible for directly overseeing the work shall ensure completion of the Event Report. The supervisor shall directly participate in the causal analysis investigation.
- d. Ensure that corrective actions have been completed and properly documented.

#### **3.1.3 Environmental Safety and Quality Personnel**

Environmental Safety and Quality Personnel (Environmental Safety Coordinator, Environmental Safety Specialist, and Project Quality Control personnel) shall:

- a. Ensure that all notifications are made promptly.
- b. Ensure that all reports are fully completed.
- c. Ensure that all insurance and workers compensation forms are completed and submitted as necessary.
- d. Participate in event investigations of all Occupational Safety and Health Administration (OSHA)

recordable injuries/illnesses, spills, releases, and other investigations.

- e. Communicate information about the event to applicable site and/or office employees.

#### **3.1.4 Project Quality Control Manager**

The Project Quality Control Manager shall review and approve QER investigation results, proposed remedial actions, determine the Event Risk in accordance with CRL Guideline HSG 2-7, Risk Prioritization, and identify the need to verify the effectiveness of corrective actions taken based on severity of Event Risk. The Project Quality Control Manager's evaluation of corrective action effectiveness should be summarized in the Comments section. Ineffective corrective actions should be elevated to the Director, Quality Programs for further evaluation and potential additional programmatic corrective actions.

#### **3.1.5 Project Environmental and Safety Manager (PESM)**

The PESH shall review and approve event investigation results, proposed remedial actions, determine the Event Risk in accordance with CRL Guideline HSG 2-7, Risk Prioritization, and identify the need to verify the effectiveness of corrective actions taken based on severity of Event Risk. The PESH's evaluation of corrective action effectiveness should be summarized in the Comments section. Ineffective correction actions should be elevated to the Director, EHS Services for further evaluation and potential additional programmatic corrective actions.

#### **3.1.6 Director, EHS Services**

The Director, EHS Services shall:

- a. Notify OSHA of any injuries or illnesses occurring within OSHA jurisdiction as required.
- b. Review/maintain log - which includes information on basis causes, immediate causes, and management control issues - of all investigations.
- c. Distribute summaries of events with periodic management reports.
- d. Communicate significant events to key personnel within the Company.
- e. Review basic causes of Company events to identify trends.
- f. Recommend EHS program modifications as necessary.
- g. Immediately notify the Tetra Tech Health and Safety Manager of any serious accident and provide follow-up information on serious accidents.
- h. Provide Monthly Injury Reports to the Tetra Tech Health and Safety Director.

### **3.2 Notifications**

In addition to the reporting responsibilities specified in Section 3.1, the responsible supervisor is required to notify Work Care at 800-455-6155 (available 24 hours) of employee illness or injuries. Work Care's main office must be notified promptly of all injuries and illnesses so the affected employee receives prompt and appropriate medical advice. The call to Work Care must be made in addition to taking the affected employee to the local clinic. EHS 2-1, Emergency Preparedness, provides guidance for medical response and actions.

The responsible supervisor is also required to ensure notifications are made as outlined in Table 1.

The phone numbers and other means of contact for Company personnel shall be posted with the emergency notification list and/or integrated into the site-specific emergency notification list.

### 3.3 Event Report Generation

The information portion of the Event Report should be generated by the end of the supervisor's work shift on the day of the event, if possible, but no later than 24 hours after the event was reported by the supervisor and employee(s) involved in the event. The investigation completion time is provided in Section 3.4.

The Event Report and Investigation may be completed electronically in the Company Incident Database located on Lotus Notes or by hardcopy using Attachment A, Event Report and Investigation Form, or Attachment B, Quality Event Report Form. (Attachment C, Event Sketch, may be used to graphically depict **events**).

The forms are intended to be self-explanatory. If the supervisor or the employee has any questions regarding completion of the report, an ESQ representative should be contacted for support.

Both the employee(s) and the employee's supervisor must sign the Event Report.

For low loss-potential near misses, the ZIP Slip may be substituted for the standard Event Report. (See CRL Procedure PP-10, Employee Recognition).

### 3.4 Event Investigations

Event investigations are to be initiated and completed as soon as possible, but should be completed no later than 10 working days after the event has been reported.

Guidance for conducting investigations and cause analysis may be found in Section 4.3.

**Table 1. Internal Notifications By Supervisor**

<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 req 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 req 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	Same day
			VP Construction, VP Remediation, VP C&E, COO	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 PESM 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

TTEC's event investigation procedure and event report database is a tool used by the (ESQ) organization for continuous improvement by:

- Identifying the root causes of each event
- Tracking and trending
- Selecting appropriate corrective action(s), and person(s) responsible for corrections
- Providing Lessons Learned
- Identifying additional EHS orientation and training topics
- Identifying future health and safety goals and objectives

Corporate ESQ management periodically disseminates valuable information contained in the event/investigation program, company wide to employees in the form of ZIP Bulletins, Flash Reports, and Lessons Learned.

The EMS Coordinator should also review the Event Report database to identify trends and incorporate results into the continuous improvement of the EMS.

## 4.3 Cause Analysis

### 4.3.1 Immediate Cause

Determine the immediate causes, using the examples on the form. If one or more of the examples fits the circumstance, use those words in the cause description. Explain, e.g., Improper Lifting – employee attempted to lift box by bending at the waist and twisting while lifting. Be sure that the event description is sufficiently detailed to support the causal analysis in this section. An assumption of cause (e.g., improper lifting) from the injury (low back pain) is not acceptable.

### 4.3.2 Basic Cause

Like the Immediate Causes, use the guidewords on the form whenever appropriate and explain. For example, improper motivation may be because the correct way takes more time or effort; short cutting standard procedure is tolerated or positively reinforced; or the person thinks there is no personal benefit to always doing the job correctly.

Investigators should determine if a change in the work conditions, scope, methods or personnel contributed to the event. This may occur due to inadequate assessment of hazard potential or inadequate application of

hazard controls. If "Change" was contributing, it will most likely be identified in combination with other basic causes.

**Note:** The investigator is encouraged to review the Practical Loss Control Leadership chapters on *Causes and Effects of Loss* and *Accident/Event Investigation* before doing the causal analysis. The investigation team should refer to the S.C.A.T. Chart available from the PESM when analyzing causes of high loss potential events, especially where motivation is suspected of being a Basic Cause.

#### 4.3.3 Remedial Actions

Include all actions taken or those that should be taken to *prevent recurrence*. Be sure that actions address the causes. For example, training (safety meetings) may be a necessary response for lack of knowledge, but may be inadequate for improper motivation.

#### 4.4 Loss Control Leadership for Non-Supervisory Personnel

All non-supervisory and non-ESQ positions (excluding craft workers) assigned to conduct field activities should complete the Practical Loss Control Leadership self-study course within one year of initial assignment.

## 5.0 REFERENCES

### Please Describe your Reference Here

### Place Your Link in this Column

1. OSHA 29 CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals
2. EHS 1-10, External Regulatory Inspections and Notifications
3. EHS 2-1, Emergency Preparedness
4. EHS 3-2, Procedures - Environmental, Health & Safety Plan(s)
5. Environmental Management System
6. HSG 2-7, Risk Prioritization
7. PP-10, Employee Recognition
- 8.
- 9.

## 6.0\_ATTACHMENTS

### Please Provide a Description of the Attachment

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"/>	
<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>			
<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	
Struck by or against		Chemical Exposure	Fire
Caught in, between or under		Property damage	Environmental Release
		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

<p><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.</p>		
<b>Section 2, Affected Employee Information</b>		
<p>Include injured person, driver/operator, or employee whose activities resulted in the event. A new event report must be created for each injured employee.</p>		
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>		
<p>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."</p>		
<p>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.</p>		
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		
<p>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.</p>		
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>			
<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) 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: \$	
<b>Cause Analysis</b>			
<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"/> 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.		
Section 5, Persons Performing Investigation			
Investigator's name:		Date:	
Investigator's name:		Date:	
Investigator's name:		Date:	
Management Review			
<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.**  
**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>
	<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**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST—AIR QUALITY**

CONFIDENTIAL

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**

CONFIDENTIAL

<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

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<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.**  
**PESM INSPECTION CHECKLIST—AIR QUALITY**

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>
			<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. a. Inspectors that conduct asbestos surveys. (40 CFR 763.85(a)) b. Workers conducting response actions or maintenance activity. c. Contractor/Supervisors conducting response actions/maintenance activities. d. Persons who develop management plans per 40 CFR 763.93. e. Project Designer who designs activities associated with response actions/maintenance activities. f. Project Monitor who oversees abatement activities performed by contractor. (40 CFR 763, Appendix C) 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.*

<b>Drinking Water Systems.</b> (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.
<b>Well Construction and Abandonment.</b> (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>

<b>Wellhead Protection.</b> <i>(Applies when project is located near water wells or "well fields" supplying public water.)</i>			
		<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)	
<b>Water Withdrawal.</b> <i>(Applies if groundwater is being withdrawn.)</i>			
		<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)	
<b>--End of Checklist--</b>			


**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST—EHS/EMS PROGRAMS**

**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 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>
		<b>a) 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>
		<b>a) EHS Daily Briefings</b> conducted – contents properly documented, EMS issues discussed (ESQ Policy, worker impacts to environment, pollution prevention).
		<b>b) "Major Projects"</b> conduct weekly meetings. Documentation is maintained.
		<b>7. Incident/Regulatory Reporting (EHS 1-7)</b>
		<b>a) Incident reports</b> submitted for all incidents in a timely fashion.
		<b>b) Investigation report</b> submitted for all incidents in a timely fashion.
		<b>c) Corrective actions</b> identified in the investigation report have been completed and closure has been documented.
		<b>d) Employer's first report of injury</b> prepared and submitted on time.
		<b>e) Permit exceedences/spills/releases</b> have been reported to regulatory agencies as required by law or regulation.
		<b>8. Manifests/TtEC Permits (EHS 1-8).</b>
		<b>a) Manifests</b> are not signed by TtEC personnel except as allowed by EHS 1-8.
		<b>b) No environmental permits</b> 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**

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<b>9. Recordkeeping (EHS 1-9).</b> All EHS records maintained per procedure Personnel medical clearance EHS Correspondence H&S Logbooks Weekly Reports Air/noise monitoring records are complete including calibration, monitoring records, chain of custody, laboratory results, and employee notifications as necessary. EHS Compliance Documents EHS Program Documentation (e.g., work permit, fit-test results, etc.)	
	<b>10. External Regulatory Inspections/Notices (EHS 1-10).</b> Have any inspections been conducted by external EHS regulatory agency? If so, when? External EHS Inspection checklist completed, maintained in files, and notifications were made per procedure. Are corrective actions completed?	
	<b>11. EHS/EMS Training (EHS 1-11).</b>	
	<b>a)</b> All staff (including subcontractors) have required EHS and TtEC training. Documentation is maintained on-site as required by EHS 1-11.	
	<b>b)</b> Training on EHS, WM, and DOT Plans have occurred and is documented (EHS 3-2).	
	<b>c)</b> Are personnel trained in the environmental aspects of their activities?	
	<b>12. Ergonomics (EHS 3-1).</b> Field and Office Ergonomic evaluations have been conducted as suggested in EHS 3-1	
	<b>13. EHS Plans (EHS 3-2).</b>	
	<b>a)</b> Meets requirements of EHS 3-2, including requirements under 29 CFR 1910.120 and any other safety or environmental statute or regulation.	
	<b>b)</b> Are TIP/RMP risks incorporated into EHS plan?	
	<b>c)</b> Completed, approved, and signed copy is on-site.	
	<b>d)</b> Has been modified to reflect changing site condition/activities.	
	<b>e)</b> Is being implemented as written.	
	<b>f)</b> Identifies activity hazard analyses, which adequately address site hazards (EHS 3-5).	
	<b>g)</b> Identifies PPE, which is appropriate for site contaminants, actual, and potential exposure levels, and site activities.	
	<b>h)</b> Identifies Air/Noise monitoring strategy (s), which is appropriate for contaminants and activities.	
	<b>i)</b> Lists action levels which are appropriate and action levels are being implemented.	
	<b>j)</b> Identifies exclusion, CRZ, and support zones, site is clearly demarcating these zones per EHS plan (EHS 3-4).	


**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**

<b>Project:</b>			<b>Inspector:</b>				<b>Date:</b>			
Yes	No	N/A	<b>REQUIREMENTS</b>						<b>COMMENTS/NOTES</b>	
			22. ESQ Policy posted.							
			23. TtEC Hotline Poster.							
			24. ZIP/EMS Bulletins are posted, as appropriate.							
<b>Work Practices and EHS Knowledge</b>										
			25. Identify at least 1 Safety Observation performed							
			a) Do Site Personnel: Where appropriate PPE Understand risks Implement appropriate controls Implement permit systems Comply with EHS Plan requirements							
			b) Do Supervisors: Provide appropriate tasking Identify competent persons as necessary Provide sufficient oversight							
			26. EHS personnel have good knowledge regarding use and limitations of the monitoring equipment.							
			27. TtEC (including craft labor) and subcontractor employees are aware of the ESQ policy and commitments it contains.							
<b>High Loss Potential Activities (Meet TtEC and/or Regulatory Requirements)</b>										
			28. Asbestos operations (EHS 8-1).							
			29. Hazardous Materials Management (EHS 3-7).							
			30. Confined space entries (EHS 6-1).							
			31. Drill rigs (EHS 6-2).							
			32. Excavations (EHS 6-3).							
			33. Lockout/ tagout (EHS 6-4).							
			34. Hotwork (EHS 6-5).							
			35. Boating (EHS 6-6).							
			36. Drum Handling (EHS 6-7).							
			37. Adequate fall protection (EHS 3-8).							
			38. Hydroblasting.							
			39. Demolition (EHS 6-8).							
			40. Crane operations.							
			41. UXO Operations.							
<b>Emergency Preparedness</b>										
			42. SCBAs for emergency use inspected each month and documented.							
			43. Sufficient dedicated ER equipment available.							


**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.	
			<b>a) 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--

**EHS 3-3 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>

*This checklist applies to all projects involved in field construction activities.*

<b>Utilities</b> ( <i>Applies if project involves the construction, extension, or hookup or shutoff of utilities.</i> )			
			<p><b>1. Utilities.</b> Project involves the construction, hook-up or shut-off and extension of the following utilities. <i>Circle all that apply.</i></p> <ul style="list-style-type: none"> <li>a. Electric</li> <li>b. Phone</li> <li>c. Water</li> <li>d. Sewer</li> <li>e. Gas</li> <li>f. Other:</li> </ul>
			<p><b>2. Permit/Approval.</b> Permit/approval from local government, state utility siting commission, state agency, or federal base personnel was obtained prior to commencing construction, extension, hook-up, or shut-off activities. Permit/approval is located in the on-site project files or conspicuously posted, if required. (State/local regulations, Base requirements)</p>
			<p><b>3. Inspection.</b> Regulatory agency has conducted an inspection of the activities. <i>In the adjacent column note the date of the inspection(s) and the results.</i></p>
<b>Zoning/Land Use</b>			
			<p><b>4. Zoning.</b> Project constitutes an approved use for the zoned area. If not, a conditional use permit or request for re-zoning has been obtained. (State/Local regulations) <i>Note: This issue normally will apply to larger project in which landfills are being constructed, or other larger facilities are being developed.</i></p>
			<p><b>5. Building Code.</b> Project involves the construction or placement of temporary or permanent buildings, equipment, or structures. State/local agency or base personnel responsible for reviewing/permitting these structures has been consulted. Permits and/or reviews have been obtained, if necessary. Buildings/structures comply with federal, state, and local building codes. (State/Local regulations) <i>If an inspection was conducted note the date and results.</i></p>
			<p><b>6. UFC.</b> Project involves the construction or placement of temporary or permanent buildings, equipment, or structures. State/local agency or base personnel responsible for reviewing fire safety has been consulted. Permits/approvals/reviews have been obtained, if necessary. Buildings/structures comply with federal, state, and local fire codes. (State/local regulations) <i>If an inspection was conducted note the date and results.</i></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>

			<p>a. <b>Drilling Permit/Pre-Drill Notification/Start Card.</b> Permit/approval/notification was obtained in a timely manner and is maintained in the project files. (State/Local regulations).</p>	
			<p>b. <b>Licensed Operator.</b> Documentation of Driller or Professional Geologist licensing/certification is maintained in project files. (State/Local regulations)</p>	
			<p>c. <b>Well Construction/Abandonment Standards.</b> Well was constructed/abandoned in accordance with regulatory standards/guidance. (State/Local regulations)</p>	
			<p>d. <b>Post-Abandonment Notification.</b> Notification was submitted in a timely manner and a copy is maintained in the project files. (State/Local regulations)</p>	
			<p><b>13. Clean Fill Certification/Testing.</b> Project files contain analytical testing or letter from supplier (which may be the client if from project site) that soil is clean. (State/Local regulations; GMP)</p>	
			<p><b>14. Soil Erosion Control.</b> Project involves excavation, grading or other land disturbing activities associated with construction projects.</p>	
			<p>a. Stormwater Permit. Project is complying with General or Individual Permit for Stormwater Discharges from Construction Projects as required by State/Local regulations. <i>Complete "Wastewater/Stormwater Discharge/UIC" checklist</i></p>	
			<p>b. Soil Erosion and Sediment Control Plan. Project prepared Plan and effectively implements erosion controls, inspections and maintenance requirements.</p>	
			<p>c. Grading Permit/Plan. Activities are being conducted in compliance with the permit. Permit is maintained in the project files.</p>	
			<p><b>15. Stormwater Pollution Prevention (SWPP).</b> Project has prepared a SWPP Plan to comply with the Industrial or Construction SWPP requirements (State/Local regulation) to prevent sediment and chemical contamination from migrating off the project site boundary.</p>	
			<p><b>16. Spill Prevention Control and Countermeasures Plan (SPCC).</b> Projects storing oils in quantities subject to federal regulations (40 CFR 112) have prepared and implemented an SPCC Plan and/or registered tanks (State/Local regulation). <i>Complete oil and hazardous substances checklist.</i></p>	


**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
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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>
<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) 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.)*

**General Requirements** (Please complete each line in this section.)

	<p><b>1. ESS or Designated Waste Management Role. Discuss Role of ESS or designated individual with regards to waste management at the Site.</b></p> <p>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.</p>	
	<p><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)</p> <p>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</p>	
	<p><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)</p>	
	<p><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)</p>	
	<p><b>5. Waste Analysis Plan.</b> Written waste analysis plan has been developed.</p>	

TETRA TECH EC, INC.  
 PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES

CONFIDENTIAL

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	a. Contents. The waste analysis plan includes: <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>	
	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. c. Updates. WAP is updated to reflect requirements applicable to restricted wastes. (40 CFR 265.13(b)(6) and 268.7(c) and (d))	
	<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)	
	<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. <ol style="list-style-type: none"> <li>a. A copy of the plan is kept at the project site.</li> <li>b. Areas subject to spills are inspected daily.</li> <li>c. Deterioration/malfunctions are remedied in a timely manner.</li> <li>d. All inspections are documented in a log.</li> </ol> All inspections must show deficiencies, responsibility for correcting deficiencies, and dates on which those deficiencies were corrected.	
	<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.	
	<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.	
<b>Closure/Post-Closure</b> ( <i>Applies if the project involves closure or post-closure care for any hazardous waste management unit.</i> )		
	<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)	

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".	

TETRA TECH EC, INC.  
 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: a. Is impervious: free from cracks or gaps and impervious enough to contain leaks, spills, and precipitation. b. Base is sloped (or otherwise designed) to drain and remove liquids resulting from leaks, spills, or precipitation. c. Containers are elevated or protected from contact with accumulated liquids. d. Has adequate capacity to contain 10% of volume of containers or the volume of the largest container, whichever is greater. e. Run-on into the containment system is prevented or system has sufficient capacity to contain any runoff that might enter system. f. Liquids within containment system are removed as soon as practicable. (40 CFR 264.175)		
	<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.  
 PESM 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>	

PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES

CONFIDENTIAL

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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> <i>Ancillary equipment is provided with secondary containment. (40 CFR 264.193(f) and 265.193(f))</i>                      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>		

PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	
	<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>		

PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES

CONFIDENTIAL

Project:		Inspector:	Date:
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>		

TETRA TECH EC, INC.  
 PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES

CONFIDENTIAL

Project:	Inspector:	Date:
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>	

TETRA TECH EC, INC.  
**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

CONFIDENTIAL

Project:	Inspector:	Date:
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>	

PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES

CONFIDENTIAL

Project:		Inspector:	Date:
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>		

TETRA TECH EC, INC.  
 PESH INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	
	<p><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)</p>		
	<p><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)</p>		
	<p><b>69. Ignitable/Reactive Wastes.</b> Ignitable/reactive wastes are not placed in the surface impoundment 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; OR</li> <li>d. Surface impoundment is used solely for emergencies. (40 CFR 264.229 and 265.229)</li> </ul>		
	<p><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)</p>		
	<p><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)</p>		
	<p><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)</p>		


**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>
	<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>	

TETRA TECH EC, INC.  
 PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES

CONFIDENTIAL

Project:	Inspector:	Date:
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>	

PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	
	<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>		

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>

**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>	

TETRA TECH EC, INC.  
 PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	
	<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).		
	<b>93. Inspection.</b> The following inspections have or are being conducted. Documentation is placed in on-site files. 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)) 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)). 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))		
	<b>94. Release.</b> If leak detected, the following has been conducted: (40 CFR 264.573(m) and 265.443(m)) a. <b>Repair.</b> Condition was promptly repaired and any cleanup was conducted. b. <b>Recordkeeping.</b> Condition/release was recorded in operating record. 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. d. <b>Certification.</b> Independent engineering certification was submitted upon completion of repairs and cleanup.		
	<b>95. State-Specific Requirements.</b> Drip pads comply with state-specific requirements. (State Hazardous Waste Regulations)		
<b>Landfills</b>			
	<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 a. Double liners; b. Leak detection; and c. Groundwater monitoring. (40 CFR 264.301, 264.90 - 100 and 265.301)		
	<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)		


**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

**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>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>	

TETRA TECH EC, INC.  
 PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES

CONFIDENTIAL

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<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>	

PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	
	<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>		

TETRA TECH EC, INC.  
 PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	
	<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)		

TETRA TECH EC, INC.  
**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	
	<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. (This section applies to interim status facilities only.)</b>			
	<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)		

TETRA TECH EC, INC.  
 PESH INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES

CONFIDENTIAL

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<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> <i>(Applies to interim status facilities only.)</i>		
	<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))	

TETRA TECH EC, INC.  
**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

CONFIDENTIAL

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<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>		

TETRA TECH EC, INC.  
**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

**CONFIDENTIAL**

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<p><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))</p>	
	<p><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.</p>	
	<p><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.</p>	
	<p><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)</p>	
	<p><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))</p>	
	<p><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))</p>	
	<p><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)</p>	
	<p><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))</p>	

TETRA TECH EC, INC.  
 PESH INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES

CONFIDENTIAL

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<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>	

TETRA TECH EC, INC.  
 PESH INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES

CONFIDENTIAL

Project:	Inspector:	Date:
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>		


**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	
	<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>		

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>

**Training**

	<p><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))</p>	
	<p><b>168. Annual Refresher.</b> Personnel have undergone annual refresher training. (40 CFR 264.16(c) and 265.16(c))</p>	
	<p><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))</p>	
	<p><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))</p>	

**Preparedness and Prevention**

	<p><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)</p> <ul style="list-style-type: none"> <li>a. Area is surrounded by a fence or natural barrier.</li> <li>b. Entrances are locked or monitored on a 24-hour basis.</li> <li>c. Signs with "Danger-Unauthorized Personnel Keep Out" are posted at each entrance and other locations as appropriate.</li> <li>d. Signs are legible from at least 25 feet and are written in English or other language predominant in the area.</li> </ul>	
	<p><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)</p>	
	<p><b>173. Equipment.</b> Project site is equipped with:</p> <ul style="list-style-type: none"> <li>a. Internal communication or alarm system.</li> <li>b. Telephone or hand-held two-way radio capable of summoning help.</li> <li>c. Spill control, and decontamination equipment, and</li> <li>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)</li> </ul>	
	<p><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)</p>	
	<p><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)</p>	

TETRA TECH EC, INC.  
 PESH INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES

CONFIDENTIAL

Project:		Inspector:	Date:
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)		

TETRA TECH EC, INC.  
 PESH 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>

**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>	

TETRA TECH EC, INC.  
 PESH INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES

CONFIDENTIAL

Project:	Inspector:	Date:
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>	

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>

**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>	

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>
	<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>

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>

		<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>a. 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. 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>c. 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>	
		<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>	
<b>Satellite Accumulation</b>			
		<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>	
		<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>	

**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>

		<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>	

**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>

			<p><b>18. Stockpiles are designed &amp; maintained appropriately (e.g. placed on poly sheeting, bermed, and <u>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.</u></b></p>	
			<p><b>19. 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.</b></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>	

**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>

			<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>	

**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>

			<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>	

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>

		<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>	

**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>

			<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>	

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>

			<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>It 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**

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>

			<p><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)</p>	
			<p><b>53. Testing.</b> Emergency equipment is tested/maintained to assure proper operation and records are kept of testing. (GMP; 40 CFR 265.33)</p>	
			<p><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.</p> <p>When only one employee is on-site, he/she has immediate access to communication device.</p> <p>(40 CFR 265.34)</p>	
			<p><b>55. Local Arrangements.</b> Arrangements have been made with emergency response agencies. (40 CFR 265.37)</p>	
<p><b>Contingency Planning (NOTE: THESE REQUIREMENTS MAY BE COVERED IN THE SITE-SPECIFIC HEALTH &amp; SAFETY PLAN)</b></p>				
			<p><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>).</p>	
			<p><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)</p>	
			<p><b>58. Revision of HWCP.</b> HWCP is reviewed and amended immediately when:</p> <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> <p>(40 CFR 265.54)</p>	

**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>
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		<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>	

**Offsite Transportation/Disposal**

		<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>	

**Onsite Disposal** (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.)

**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>

**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>	

**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>

	<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>

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	

		<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>	

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	

		<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>

**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>

**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); See ZIP Bulletin 260</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/Diversionsary 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>	

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>
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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>	

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>
Yes No N/A	<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> <p>a. Water is inspected for visible signs of contamination prior to release</p> <p>b. Water is removed daily, or as necessary to prevent excessive accumulation</p>	
<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>) <i>For example, oil refineries and terminals.</i></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>	

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>
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>	

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>
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)	

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>

	<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

<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 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		
		<p><b>1. 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))</p>
		<p><b>2. 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))</p>
		<p><b>3. 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)</p>
		<p><b>4. Awaiting Analytical.</b> PCB wastes are being stored awaiting analytical regarding PCB concentration.</p>
<p><b>Storage 30 Days or Less</b> (Applies if PCBs are stored at project site for 30 days or less.)  <i>Note: See General Requirements for additional requirements applicable to less than 30-day storage areas.</i></p>		
		<p><b>5. Designated Area.</b> A designated area has been established for accumulation of PCB wastes. (GMP)</p>
		<p><b>6. 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))</p>
		<p><b>7. PCB Article/Type of Wastes.</b> Only the following PCB wastes are stored:</p>
		<p>a. Non-leaking PCB articles/PCB equipment.</p>
		<p>b. Leaking PCB articles/equipment if placed in non-leaking container with sufficient absorbent.</p>
		<p>c. PCB Containers containing non-liquid PCBs (soil/rags/debris).</p>
		<p>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))</p>

ATTACHMENT C  
TETRA TECH EC, INC.  
PESM INSPECTION CHECKLIST— POLYCHLORINATED BIPHENYLS

CONFIDENTIAL

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
<b>Yes</b>	<b>No</b>	<b>N/A</b>
REQUIREMENTS		COMMENTS/NOTES
	<p>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))</p>	
<p><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></p>		
	<p><b>8. Accumulation Time.</b> Waste tracking log indicates PCB wastes are disposed of within 1 year of being placed into storage.</p>	
	<p><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))</p>	
	<p><b>10. Curbing.</b> Floor has continuous curbing with minimum six inch high curb.</p>	
	<p><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.</p>	
	<p><b>12. Impervious Material.</b> Floor/curbing are constructed of continuous smooth and impervious materials to prevent/minimize penetration of PCBs.</p>	
	<p><b>13. Floodplain.</b> The facility is not located at a site that is below the 100-year flood water elevation.</p>	
<p><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>)</p>		
	<p><b>14. Marking Storage Area.</b> Storage area is clearly marked with "Caution-PCB" sign. (40 CFR 761.40(a)(10))</p>	
	<p><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))</p>	
	<p><b>16. Management.</b> Storage area is managed so that PCB Articles/Containers can be located by date they entered storage.</p>	

ATTACHMENT C  
TETRA TECH EC, INC.  
PESM INSPECTION CHECKLIST— POLYCHLORINATED BIPHENYLS

CONFIDENTIAL

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>	
<b>Yes</b>	<b>No</b>	<b>N/A</b>	
REQUIREMENTS			COMMENTS/NOTES
		<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 (Applies to soils and other solid PCB wastes stored in stockpiles)</b>			
		<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)	

ATTACHMENT C  
TETRA TECH EC, INC.  
PESM INSPECTION CHECKLIST— POLYCHLORINATED BIPHENYLS

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>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>		

ATTACHMENT C  
TETRA TECH EC, INC.  
PESM INSPECTION CHECKLIST— POLYCHLORINATED BIPHENYLS

CONFIDENTIAL

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<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

<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 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/exploded 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

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

		<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

<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>

			<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

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

			<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.	
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**On-Site Landfill**

			<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)	
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			<b>30. Permitting/Licensing.</b> Permit/license has been obtained to construct/operate landfill. Construction/operation complies with conditions of permit. (State/local regulations)	
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			<b>31. Operation.</b> Landfill is operating in compliance with permit including, if applicable, O&M Plan, inspection, waste acceptance, monitoring, reporting, and recordkeeping requirements. (40 CFR 258, State/local regulations)	
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			<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>	
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**Unexploded Ordnance/Ordnance Explosive Waste/Chemical Warfare Material**

			<b>33. Site-Specific UXO Work Plan.</b> A site-specific workplan has been developed for the project.	
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			<b>34. UXO Team On-site.</b> UXO team is on-site to oversee all operations which have potential for UXO/OEW.	
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			<b>35. Management.</b> OEW and CWM may be RCRA regulated material. <i>Complete "Hazardous Waste" checklists, as appropriate.</i>	
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**Used Oil** *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.*

			<b>36. Testing.</b> Used oil has been tested and determined: <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>	
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**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**

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<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>	




**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>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>	


**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>

<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>




**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>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>		
<p><i>Federal USTs (This section applies to USTs owned by Federal Agencies and are a result of the Federal Policy Act of 2005)</i></p>					
			<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>		
			<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>		
			<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>		
			<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>		

--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>a. <b>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>


**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— WASTEWATER/STORMWATER DISCHARGES/UIC**

CONFIDENTIAL

Project:	Inspector:	Date:
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>	


**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— WASTEWATER/STORMWATER DISCHARGES/UIC**

CONFIDENTIAL

Project:			Inspector:			Date:				
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>							

ATTACHMENT C  
TETRA TECH EC, INC.  
PESM INSPECTION CHECKLIST— WASTEWATER/STORMWATER DISCHARGES/UIC

CONFIDENTIAL

	Project:	Inspector:	Date:
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>		


**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— WASTEWATER/STORMWATER DISCHARGES/UIC**

CONFIDENTIAL

Project:		Inspector:	Date:
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>		


**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— WASTEWATER/STORMWATER DISCHARGES/UIC**

CONFIDENTIAL

	Project:	Inspector:	Date:
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>		


**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— WASTEWATER/STORMWATER DISCHARGES/UIC**

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>
			<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):		


**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— WASTEWATER/STORMWATER DISCHARGES/UIC**

CONFIDENTIAL

Project:		Inspector:	Date:
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>	

ATTACHMENT C  
TETRA TECH EC, INC.  
PESM INSPECTION CHECKLIST— WASTEWATER/STORMWATER DISCHARGES/UIC

CONFIDENTIAL

Project:		Inspector:	Date:
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>		


**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>

			<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>	


**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— WASTEWATER/STORMWATER DISCHARGES/UIC**

CONFIDENTIAL

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>		



**EHS 3-3 ATTACHMENT C  
TETRA TECH EC, INC.  
PEM INSPECTION CHECKLIST— WETLANDS/STREAMS/FLOODPLAINS**

**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 all projects that could potentially impact wetlands, streams, and floodplains.*

<b>Wetlands</b> (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>	

**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>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>
<b>Floodplain/Flood Control</b> <i>(Applies when project will potentially impact floodplains or is located in a flood control area)</i>			
			<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)


**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>

	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>	

**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>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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**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>

	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>

			<p>3. Are the following results of monitoring for radiation and radioactive material documented:</p> <ul style="list-style-type: none"> <li>a. Results from monitoring entries into high and very high radiation areas and contamination and high contamination areas; (835.703(a))</li> <li>b. Results of monitoring used to determine individual occupational dose from external and internal sources; (835.703(b))</li> <li>c. Results of monitoring for the release and control of material and equipment; and (835.703(c))</li> <li>d. Results of maintenance and calibration performed on survey and monitoring instruments and equipment? (835.703(d))</li> </ul>	
			<p>4. Are training records maintained to show:</p> <ul style="list-style-type: none"> <li>a. Radiation safety training (835.704(a))</li> <li>b. Actions taken to maintain occupational exposure ALARA (835.704(b))</li> <li>c. Documentation of the results of internal audits and other reviews of program content and implementation (835.704(c))</li> <li>d. Written declarations of pregnancy (835.704(d))</li> <li>e. Changes in equipment, techniques, and procedure used for monitoring (835.704(e))</li> <li>f. As necessary to demonstrate compliance with the requirements for sealed radioactive source control, inventory, and source leak tests? (835.704(f))</li> </ul>	

**Reports to Individuals and Licensor** *(Applies if a radioactive material license exists.)*

			<p>1. Is a report to individuals concerning their radiation exposure being reported when:</p> <ul style="list-style-type: none"> <li>a. Is reported in writing and includes the DOE site or facility name, the individuals name, SS number, employee number, or other unique identification number (835.801(a))</li> <li>b. Upon request of the individual terminating employment (835.801(b))</li> <li>c. Annually (835.801(c))</li> <li>d. Upon request (835.801(d))</li> <li>e. When a DOE contractor is required to report to the DOE for occurrence reporting and processing? (835.801(e))</li> </ul>	
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**Sealed Radioactive Source Control** *(Applies if a radioactive material license exists.)*

			<p>1. Is there a program for control of sealed radioactive sources that are used, handled, and stored? (835.1201)</p>	
			<p>2. Is each accountable sealed source inventoried at intervals not to exceed six months and the inventory contains:</p> <ul style="list-style-type: none"> <li>a. Physical location of each accountable sealed radioactive source (835.1302(a)(1))</li> <li>b. Verify the presence and adequacy of associated postings and labels(835.1302(a)(2))</li> <li>c. Establish the adequacy of storage locations, containers, and devices? (835.1302(a)(3))</li> </ul>	

**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>
Yes No N/A	<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.**  
**PESM INSPECTION CHECKLIST— RADIOACTIVE MATERIAL/RADIATION**  
**FOR DEPARTMENT OF ENERGY PROJECTS**

*CONFIDENTIAL*

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
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			<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>
Yes No N/A	<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
<b>Keyword Index:</b>	Monitoring, Training, Field Activities/Science, Operational Control	<b>Document Type:</b>	Procedure
		<b>Document Owner:</b>	Skip Parry

Section

- 1.0 PURPOSE
- 2.0 SCOPE
- 3.0 MAINTENANCE
- 4.0 DEFINITIONS
  - 4.1 Acceptable Entry Conditions
  - 4.2 Attendant
  - 4.3 Confined Space
  - 4.4 Double Block and Bleed
  - 4.5 Engulfment
  - 4.6 Confined Space Entry Permit
  - 4.7 Entry
  - 4.8 Entry Supervisor
  - 4.9 Hazardous Atmosphere
  - 4.10 Inerting
  - 4.11 Isolation
  - 4.12 Line Breaking
  - 4.13 Non-permit Required Confined Space
  - 4.14 Oxygen Deficient
  - 4.15 Oxygen Enriched
  - 4.16 Permit Required Confined Space
  - 4.17 Prohibited Conditions
  - 4.18 Retrieval System
- 5.0 DISCUSSION
  - 5.1 Responsibilities
    - 5.1.1 Authorized Entrants
    - 5.1.2 Attendants
    - 5.1.3 Entry Supervisors
    - 5.1.4 Line Management
  - 5.2 Procedure
    - 5.2.1 Hazard Evaluation
    - 5.2.2 Atmospheric Testing

- 5.2.3 Ventilation
- 5.2.4 Isolation
- 5.2.5 Equipment Staging
- 5.2.6 Emergency and Rescue Procedures
- 5.2.7 Client/Contractor Coordination
- 5.2.8 Pre-Entry Briefing
- 5.2.9 Confined Space Operations
- 5.2.10 Deviation From Program Requirements
- 5.2.11 Identification of Confined Spaces
- 5.2.12 Program Review
- 5.2.13 Training

6.0 REFERENCES

7.0 ATTACHMENTS

## **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

**Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.**

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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 Before Confined Space   After Confined Space	Comments/Problems with Service

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: \_\_\_\_\_

**EHS 6-1 ATTACHMENT B  
CONFINED SPACE ENTRY PERMIT**

GAS TESTER NAME & CHECK #	INSTRUMENT(S) USED	MODEL &/OR TYPE	SERIAL &/OR UNIT #
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

SUPERVISOR AUTHORIZATION—ALL CONDITIONS SATISFIED: \_\_\_\_\_ DEPT/PHONE \_\_\_\_\_

PRINT NAME: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_ FUNCTION (i.e., entrant, attendant, or supervisor)

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SPECIAL REQUIREMENTS:

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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 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

1.0 PURPOSE

2.0 SCOPE

3.0 MAINTENANCE

4.0 DEFINITIONS

4.1 Benching

4.2 Competent Person

4.3 Excavation

4.4 Hazardous Atmosphere

4.5 Protective Systems

4.6 Sloping

4.7 Support System

4.8 Trench

5.0 DISCUSSION

5.1 Responsibilities

5.1.1 Competent Person

5.1.2 Line Management

5.1.3 Environmental, Health and Safety Personnel

5.2 Designation of Competent Personnel

5.3 General Requirements

5.4 Hazardous Atmospheres

5.5 Protection From Water Hazards

5.6 Stability of Adjacent Structures

5.7 Daily Inspections

5.8 Soil Classification

5.9 Sloping and Benching

5.10 Protective Systems

5.11 Training

6.0 REFERENCES

7.0 ATTACHMENTS

## **1.0 PURPOSE**

This program provides the requirements for activities involving excavations in accordance with 29 CFR 1926, Subpart P - Excavations.

## **2.0 SCOPE**

These requirements are applicable to all Tetra Tech EC, Inc. (TtEC) operations.

## **3.0 MAINTENANCE**

The Director, Environmental, Safety and Quality (ESQ) Programs is responsible for updating this procedure. Approval authority rests with TtEC's President and Chief Executive Officer. Suggestions for revision shall be submitted to both the department responsible for updating the procedure and the Executive Director Compliance and Corporate Counsel.

## **4.0 DEFINITIONS**

### **4.1 Benching**

A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

### **4.2 Competent Person**

A competent person is one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

### **4.3 Excavation**

Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

### **4.4 Hazardous Atmosphere**

An atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.

#### **4.5 Protective Systems**

A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

#### **4.6 Sloping**

A method of protecting employees from cave-ins by forming sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

#### **4.7 Support System**

A structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

#### **4.8 Trench**

A narrow excavation made below the surface of the ground. In general the depth is greater than the width, but the width of a trench measured at the bottom is not greater than 15 feet. If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet or less, the excavation is also considered to be a trench.

### **5.0 DISCUSSION**

#### **5.1 Responsibilities**

##### **5.1.1 Competent Person**

The competent person(s) shall be responsible for:

- Day-to-day oversight of open excavations and trenches
- Conducting soil classifications
- Selection of protective systems
- Conducting daily inspections of open excavations and trenches; and
- Providing the Environmental and Safety Supervisor (ESS) with all required documentation on a daily basis.

##### **5.1.2 Line Management**

The Project Manager (PM) shall be responsible for:

- Ensuring compliance with this procedure
- Providing the necessary resources for compliance with this procedure; and
- Designating competent personnel in consultation with the Project Environmental, Health and Safety Manager (PESM)

### **5.1.3 Environmental, Health and Safety Personnel**

The ESS shall be responsible for:

- Providing oversight on the implementation of the requirements contained in this procedure
- Conducting periodic reviews of open trenches and excavations
- Consulting with the project manager and competent person on excavation issues; and
- Maintaining required records.

### **5.2 Designation of Competent Personnel**

Prior to the start of any excavation work the project manager shall designate a competent person to fulfill the requirements of this procedure.

### **5.3 General Requirements**

The following section provides general requirements governing activities in and around excavation and trenches, as well as the requirements for the selection and use of protective systems.

- Surfaces surrounding open trenches and excavations shall have all surface hazards removed.
- All utilities shall be located and cleared prior to initiating digging. Public or facility utility groups shall be utilized where possible for this purpose. In the absence of either, the ESS shall specify the procedures to be used to clear utilities in consultation with the project PESH and project manager. When the excavation is open, utilities shall be supported and protected from damage. Clearance and support methods shall be documented on the daily inspection checklist.
- Where structural ramps are used for egress they shall be installed in accordance with 29 CFR 1926.651(c)(1).
- Stairways, ladders, or ramps shall be provided as means of egress in all trenches 4 feet or more in depth. Travel distance shall be no more than 25 feet between means of exit.
- Employees exposed to vehicular traffic shall wear traffic vests.
- No employee shall be permitted under loads being lifted or under loads being unloaded from vehicles.
- When vehicles and machinery are operating adjacent to excavations warning systems such as stop logs or barricades shall be utilized to prevent vehicles from entering the excavation or trench.
- Scaling or barricades shall be used to prevent rock and soils from falling on employees.

- Excavated and loose materials should be kept at least 3 feet from the edge of excavations, but at a minimum of 2 feet from the edge of the excavation in accordance with OSHA requirements.
- Walkways or bridges with standard railing shall be provided at points employees are to cross over excavations or trenches.
- Barriers shall be provided to prevent personnel from inadvertently falling into an excavation.

#### **5.4 Hazardous Atmospheres**

Where atmospheres containing less than 19.5 percent oxygen or other types of hazardous atmospheres may exist the following requirements shall be implemented.

- Atmospheric testing shall be done prior to employees entering excavations 4 feet or greater in depth.
- Testing methods shall be listed on the daily inspection checklist and results documented daily in field logs.
- Control measures such as ventilation and personal protective equipment (PPE) shall be used to control employee exposure to hazardous atmospheres below published exposure limits.
- Ventilation shall be used to control flammable and combustible vapors to below 10 percent of their lower explosive limit.
- Testing shall be repeated as often as necessary to ensure safe levels of airborne contaminants.
- Emergency equipment shall be provided and attended when the potential for a hazardous atmosphere exists. This equipment shall include but not be limited to emergency breathing apparatus, harnesses, lifelines, and basket stretchers. Required equipment will be listed on the daily inspection checklist and reviewed daily.

### **5.5 Protection From Water Hazards**

When water has collected or is collected in excavations and trenches the following requirements shall be applied.

- Employees shall not work in excavations in which water has, or is, accumulating without the use of additional protection such as special support systems or water removal.
- Water removal shall be monitored by a competent person.
- Barriers such as ditches and dikes shall be used to divert runoff from excavations and trenches.
- Trenches shall be reinspected prior to re-entry after water accumulation due to heavy rainfall or seepage.

### **5.6 Stability of Adjacent Structures**

When excavating or trenching near an adjacent structure the following practices shall be implemented.

- Support systems such as shoring, bracing, or underpinning shall be provided where the stability of buildings, walls, or other structures is endangered by excavation.
- Excavation bases or footings of foundations shall be prohibited unless support systems are used, the excavation is in stable rock, a professional engineer has determined the structure is sufficiently removed from the site as to not pose a hazard, or the PE determines that the excavation shall not pose a hazard to employees due to the structure.
- Support systems shall be used when it is necessary to undermine sidewalks, pavements, and appurtenant structures.
- Surcharge load sources and adjacent encumbrances shall be listed with their evaluation date on the daily inspection checklist.

### **5.7 Daily Inspections**

Inspections shall be performed daily on all excavations, adjacent areas, and protective systems before personnel enter the trench. The checklist provided in Attachment A or equivalent shall be used.

### **5.8 Soil Classification**

To perform soil classification, the competent person shall use a thumb test, pocket penetrometer, or shear vane to determine the unconfined compressive strength of the soils being excavated. In soils with properties that change (i.e., one soil type mixed with another within a given area) several tests may be necessary. When different soil types are present the overall classification shall be that of the type with the lowest unconfined compressive strength. Classifications shall result in a soil rating of Stable Rock, Type A, Type B, or Type C in accordance with 29 CFR 1926.652, Appendix A. Soil classifications shall be listed on the daily inspection checklist. The soils analysis checklist provided in Attachment B or equivalent shall be used for soil classifications.

### **5.9 Sloping and Benching**

All sloping and benching shall be done in accordance with 29 CFR 1926.652, Appendix B. Selection of the

sloping method and evaluation of surface surcharge loads shall be made by a competent person familiar with the requirements contained therein. Sloping and benching methods and specifications shall be listed on the daily inspection checklist.

#### **5.10 Protective Systems**

Protective systems are required on all excavations over 5 feet in depth or in excavations less than 5 feet when examination of the ground by a competent person reveals conditions that may result in cave-ins.

Selection and installation of protective systems shall be done in accordance with 29 CFR 1926.652, Appendices C & D, or manufacturers data for shoring and shielding systems. Selection of a protective system shall be made based upon soil classification and job requirements by a competent person. Protective systems and specifications shall be listed on the daily inspection checklist.

#### **5.11 Training**

Competent persons shall have an adequate combination of experience and training to classify soil types and select protective systems as outlined in 29 CFR 1926.652. Training and experience pertaining to qualification as a competent person shall be documented and include the following:

- General safety practices related to working in or near open excavations;
- Inspection requirements and techniques;
- Classification of soils in accordance with 29 CFR 1926.652, Appendix A; and
- Uses, limitations, and specifications of protective systems in accordance with 29 CFR 1926.652.

Training records shall be maintained in accordance with EHS 1-9, Recordkeeping.

### **6.0 REFERENCES**

29 CFR 1926, Subpart P, Excavations.  
Environmental, Health & Safety - Programs Procedure EHS 1-9, Recordkeeping  
OSHA (U.S. Department of Labor, Occupational Safety and Health Administration),

### **7.0 ATTACHMENTS**

Attachment A - Daily Excavation Inspection Checklist  
Attachment B - Soils Analysis Checklist

**EHS 6-3 ATTACHMENT A  
DAILY EXCAVATION INSPECTION CHECKLIST**

**Click the icon below to launch or download.**



EHS 6-3 Attachment A 04-03-03.doc

**Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.**

**EHS 6-3 ATTACHMENT B  
SOILS ANALYSIS CHECKLIST**

**Click the icon below to launch or download.**



EHS 6-3 Attachment B.doc

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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 spillings 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 determined 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*
<b><u>In Any Enclosed Space</u></b>	
Antimony, Arsenic, Barium, Cadmium, Chromium, Chromium VI <sup>2</sup> , Cobalt, Copper, Lead, Manganese, Mercury, Nickel, Ozone, Selenium, Silver, and Vanadium	Local exhaust ventilation
<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	Local exhaust ventilation vented outside the confined space <b>and</b> personnel respiratory protection required.
<b><u>Confined Spaces – Hot Work Involving:</u></b>	
- Fluorine gases - Zinc compounds	Local exhaust ventilation vented outside the confined space OR personnel respiratory protection required.
<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	Respiratory Protection required as well as engineering controls based on results of worker exposure assessment and exposure determination.
<b><u>Open Areas (Outside) Involving</u></b>	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.*

<sup>1</sup> 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.

<sup>2</sup> 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:

---



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---

**SAFETY ZONE** for work established by (check all that apply)

- Cones     Caution Tape     Natural Barrier     Welding Screen     Building     Other, explain:

---



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**SAFETY REQUIREMENTS** (check YES or NO)

- Fire Extinguisher properly rated     YES     NO    Fire watch present     YES     NO
- Combustibles covered within 35 ft     YES     NO    Work area clean     YES     NO
- Cables, hose lines, regulators, cylinders, electric sources checked     YES     NO

**SAFETY EQUIPMENT** (check all that apply)  respirator     welders mask     burning goggles

face shield,  local exhaust ventilation, and:

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Are **SPECIAL FIRE PROTECTION** procedures being implemented? (If yes, describe): \_\_\_\_\_

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**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>WORK TYPE:</p> <p><input type="checkbox"/> Cutting      <input type="checkbox"/> Welding      <input type="checkbox"/> Other</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>DATE: _____ PERMIT NO.: _____</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>LOCATION: _____</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>NATURE OF JOB: _____</p>	<p><b>REPORT EMERGENCIES BY DIALING 911 ON ANY SITE, COMPANY, OR CELL PHONE</b></p>
<p>NAME OF PERSON DOING HOT WORK: _____</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>COMPANY NAME: _____</p>	<p><b>Required Personal Protective Equipment (PPE):</b></p> <p>_____</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>RESPONSIBLE SUPERVISOR:</p> <p>NAME (Printed) _____</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>START TIME: _____ FINISH TIME: _____</p>	<p>Fire Watch Completed: _____ DATE: _____ TIME: _____ AM/PM</p>
<p>ASSIGNED FIRE WATCH:</p> <p>NAME: _____</p> <p>SIGNATURE: _____</p>	<p>_____</p>

**APPENDIX E**  
**MEDICAL DATA SHEET**

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### Medical Data Sheet

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

Project \_\_\_\_\_  
Name \_\_\_\_\_ Home Telephone \_\_\_\_\_  
Address \_\_\_\_\_  
Age \_\_\_\_\_ Height \_\_\_\_\_ Weight \_\_\_\_\_  
Person to notify in the event of an emergency: Name: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Drug or other Allergies: \_\_\_\_\_  
Particular Sensitivities: \_\_\_\_\_  
Do You Wear Contacts? \_\_\_\_\_  
What medications are you presently using? \_\_\_\_\_  
\_\_\_\_\_  
Name, Address, and Phone Number of personal physician: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

---

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

HIPAA 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**

### **MATERIAL SAFETY DATA SHEETS/SAFETY DATA SHEETS**

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# Safety Data Sheet

**Material Name: Diesel Fuel, All Types**

**SDS No. 9909**  
US GHS

**Synonyms:** Ultra Low Sulfur Diesel; Low Sulfur Diesel; No. 2 Diesel; Motor Vehicle Diesel Fuel; Non-Road Diesel Fuel; Locomotive/Marine Diesel Fuel

## \*\*\* Section 1 - Product and Company Identification \*\*\*

### Manufacturer Information

Hess Corporation  
1 Hess Plaza  
Woodbridge, NJ 07095-0961

Phone: 732-750-6000 Corporate EHS  
Emergency # 800-424-9300 CHEMTREC  
[www.hess.com](http://www.hess.com) (Environment, Health, Safety Internet Website)

## \*\*\* Section 2 - Hazards Identification \*\*\*

### GHS Classification:

Flammable Liquids - Category 3  
Skin Corrosion/Irritation – Category 2  
Germ Cell Mutagenicity – Category 2  
Carcinogenicity - Category 2  
Specific Target Organ Toxicity (Single Exposure) - Category 3 (respiratory irritation, narcosis)  
Aspiration Hazard – Category 1  
Hazardous to the Aquatic Environment, Acute Hazard – Category 3

### GHS LABEL ELEMENTS

#### Symbol(s)



#### Signal Word

DANGER

#### Hazard Statements

Flammable liquid and vapor.  
Causes skin irritation.  
Suspected of causing genetic defects.  
Suspected of causing cancer.  
May cause respiratory irritation.  
May cause drowsiness or dizziness.  
May be fatal if swallowed and enters airways.  
Harmful to aquatic life.

#### Precautionary Statements

##### Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking  
Keep container tightly closed.  
Ground/bond container and receiving equipment.

# Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

Use explosion-proof electrical/ventilating/lighting/equipment.  
Use only non-sparking tools.  
Take precautionary measures against static discharge.  
Wear protective gloves/protective clothing/eye protection/face protection.  
Wash hands and forearms thoroughly after handling.  
Obtain special instructions before use.  
Do not handle until all safety precautions have been read and understood.  
Avoid breathing fume/mist/vapours/spray.

## Response

In case of fire: Use water spray, fog or foam to extinguish.  
IF ON SKIN (or hair): Wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical advice/attention.  
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell.  
If swallowed: Immediately call a poison center or doctor. Do NOT induce vomiting.  
IF exposed or concerned: Get medical advice/attention.

## Storage

Store in a well-ventilated place. Keep cool.  
Keep container tightly closed.  
Store locked up.

## Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

## \* \* \* Section 3 - Composition / Information on Ingredients \* \* \*

CAS #	Component	Percent
68476-34-6	Fuels, diesel, no. 2	100
91-20-3	Naphthalene	<0.1

A complex mixture of hydrocarbons with carbon numbers in the range C9 and higher.

## \* \* \* Section 4 - First Aid Measures \* \* \*

### First Aid: Eyes

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

### First Aid: Skin

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or with waterless hand cleanser. Obtain medical attention if irritation or redness develops. Thermal burns require immediate medical attention depending on the severity and the area of the body burned.

### First Aid: Ingestion

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

# Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

## First Aid: Inhalation

Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

## \* \* \* Section 5 - Fire Fighting Measures \* \* \*

### General Fire Hazards

See Section 9 for Flammability Properties.

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

### Hazardous Combustion Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

### Extinguishing Media

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO<sub>2</sub>, water spray, fire fighting foam, and other gaseous agents.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

### Unsuitable Extinguishing Media

None

### Fire Fighting Equipment/Instructions

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment. Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing. Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

## \* \* \* Section 6 - Accidental Release Measures \* \* \*

### Recovery and Neutralization

Carefully contain and stop the source of the spill, if safe to do so.

### Materials and Methods for Clean-Up

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal. Caution, flammable vapors may accumulate in closed containers.

### Emergency Measures

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

# Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

## Personal Precautions and Protective Equipment

Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

## Environmental Precautions

Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

## Prevention of Secondary Hazards

None

## \* \* \* Section 7 - Handling and Storage \* \* \*

### Handling Procedures

Handle as a combustible liquid. Keep away from heat, sparks, excessive temperatures and open flame! No smoking or open flame in storage, use or handling areas. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

### Storage Procedures

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks."

### Incompatibilities

Keep away from strong oxidizers.

## \* \* \* Section 8 - Exposure Controls / Personal Protection \* \* \*

### Component Exposure Limits

#### Fuels, diesel, no. 2 (68476-34-6)

ACGIH: 100 mg/m<sup>3</sup> TWA (inhalable fraction and vapor, as total hydrocarbons, listed under Diesel fuel)  
Skin - potential significant contribution to overall exposure by the cutaneous route (listed under Diesel fuel)

# Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

## Naphthalene (91-20-3)

ACGIH: 10 ppm TWA  
15 ppm STEL  
Skin - potential significant contribution to overall exposure by the cutaneous route  
OSHA: 10 ppm TWA; 50 mg/m<sup>3</sup> TWA  
NIOSH: 10 ppm TWA; 50 mg/m<sup>3</sup> TWA  
15 ppm STEL; 75 mg/m<sup>3</sup> STEL

## Engineering Measures

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

## Personal Protective Equipment: Respiratory

A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

## Personal Protective Equipment: Hands

Gloves constructed of nitrile, neoprene, or PVC are recommended.

## Personal Protective Equipment: Eyes

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

## Personal Protective Equipment: Skin and Body

Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

## \*\*\* Section 9 - Physical & Chemical Properties \*\*\*

<b>Appearance:</b>	Clear, straw-yellow.	<b>Odor:</b>	Mild, petroleum distillate odor
<b>Physical State:</b>	Liquid	<b>pH:</b>	ND
<b>Vapor Pressure:</b>	0.009 psia @ 70 °F (21 °C)	<b>Vapor Density:</b>	>1.0
<b>Boiling Point:</b>	320 to 690 °F (160 to 366 °C)	<b>Melting Point:</b>	ND
<b>Solubility (H<sub>2</sub>O):</b>	Negligible	<b>Specific Gravity:</b>	0.83-0.876 @ 60°F (16°C)
<b>Evaporation Rate:</b>	Slow; varies with conditions	<b>VOC:</b>	ND
<b>Percent Volatile:</b>	100%	<b>Octanol/H<sub>2</sub>O Coeff.:</b>	ND
<b>Flash Point:</b>	>125 °F (>52 °C) minimum	<b>Flash Point Method:</b>	PMCC
<b>Upper Flammability Limit (UFL):</b>	7.5	<b>Lower Flammability Limit (LFL):</b>	0.6
<b>Burning Rate:</b>	ND	<b>Auto Ignition:</b>	494°F (257°C)

## \*\*\* Section 10 - Chemical Stability & Reactivity Information \*\*\*

### Chemical Stability

This is a stable material.

### Hazardous Reaction Potential

Will not occur.

# Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

## Conditions to Avoid

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources.

## Incompatible Products

Keep away from strong oxidizers.

## Hazardous Decomposition Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

## \* \* \* Section 11 - Toxicological Information \* \* \*

### Acute Toxicity

#### A: General Product Information

Harmful if swallowed.

#### B: Component Analysis - LD50/LC50

##### Naphthalene (91-20-3)

Inhalation LC50 Rat >340 mg/m<sup>3</sup> 1 h; Oral LD50 Rat 490 mg/kg; Dermal LD50 Rat >2500 mg/kg; Dermal LD50 Rabbit >20 g/kg

### Potential Health Effects: Skin Corrosion Property/Stimulativeness

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed.

### Potential Health Effects: Eye Critical Damage/ Stimulativeness

Contact with eyes may cause mild irritation.

### Potential Health Effects: Ingestion

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

### Potential Health Effects: Inhalation

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

### Respiratory Organs Sensitization/Skin Sensitization

This product is not reported to have any skin sensitization effects.

### Generative Cell Mutagenicity

This material has been positive in a mutagenicity study.

### Carcinogenicity

#### A: General Product Information

Suspected of causing cancer.

# Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

Studies have shown that similar products produce skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.

## B: Component Carcinogenicity

### Fuels, diesel, no. 2 (68476-34-6)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans (listed under Diesel fuel)

### Naphthalene (91-20-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

NTP: Reasonably Anticipated To Be A Human Carcinogen (Possible Select Carcinogen)

IARC: Monograph 82 [2002] (Group 2B (possibly carcinogenic to humans))

## Reproductive Toxicity

This product is not reported to have any reproductive toxicity effects.

## Specified Target Organ General Toxicity: Single Exposure

This product is not reported to have any specific target organ general toxicity single exposure effects.

## Specified Target Organ General Toxicity: Repeated Exposure

This product is not reported to have any specific target organ general toxicity repeat exposure effects.

## Aspiration Respiratory Organs Hazard

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

## \* \* \* Section 12 - Ecological Information \* \* \*

## Ecotoxicity

### A: General Product Information

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations.

### B: Component Analysis - Ecotoxicity - Aquatic Toxicity

#### Fuels, diesel, no. 2 (68476-34-6)

##### Test & Species

Test & Species	Conditions
96 Hr LC50 Pimephales promelas	35 mg/L [flow-through]

##### Conditions

#### Naphthalene (91-20-3)

##### Test & Species

Test & Species	Conditions
96 Hr LC50 Pimephales promelas	5.74-6.44 mg/L [flow-through]
96 Hr LC50 Oncorhynchus mykiss	1.6 mg/L [flow-through]
96 Hr LC50 Oncorhynchus mykiss	0.91-2.82 mg/L [static]
96 Hr LC50 Pimephales promelas	1.99 mg/L [static]

##### Conditions

# Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

96 Hr LC50 Lepomis macrochirus	31.0265 mg/L [static]
72 Hr EC50 Skeletonema costatum	0.4 mg/L
48 Hr LC50 Daphnia magna	2.16 mg/L
48 Hr EC50 Daphnia magna	1.96 mg/L [Flow through]
48 Hr EC50 Daphnia magna	1.09 - 3.4 mg/L [Static]

## Persistence/Degradability

No information available.

## Bioaccumulation

No information available.

## Mobility in Soil

No information available.

### \*\*\* Section 13 - Disposal Considerations \*\*\*

## Waste Disposal Instructions

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

## Disposal of Contaminated Containers or Packaging

Dispose of contents/container in accordance with local/regional/national/international regulations.

### \*\*\* Section 14 - Transportation Information \*\*\*

## DOT Information

Shipping Name: Diesel Fuel

NA #: 1993 Hazard Class: 3 Packing Group: III

Placard:



### \*\*\* Section 15 - Regulatory Information \*\*\*

## Regulatory Information

### Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

#### Naphthalene (91-20-3)

CERCLA: 100 lb final RQ; 45.4 kg final RQ

#### SARA Section 311/312 – Hazard Classes

<u>Acute Health</u>	<u>Chronic Health</u>	<u>Fire</u>	<u>Sudden Release of Pressure</u>	<u>Reactive</u>
X	X	X	--	--

# Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

## SARA SECTION 313 - SUPPLIER NOTIFICATION

This product may contain listed chemicals below the de minimis levels which therefore are not subject to the supplier notification requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372. If you may be required to report releases of chemicals listed in 40 CFR 372.28, you may contact Hess Corporate Safety if you require additional information regarding this product.

## State Regulations

### Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Fuels, diesel, no. 2	68476-34-6	No	No	No	Yes	No	No
Naphthalene	91-20-3	Yes	Yes	Yes	Yes	Yes	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

### Component Analysis - WHMIS IDL

No components are listed in the WHMIS IDL.

### Additional Regulatory Information

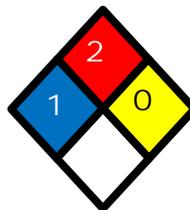
### Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Fuels, diesel, no. 2	68476-34-6	Yes	DSL	EINECS
Naphthalene	91-20-3	Yes	DSL	EINECS

## \*\*\* Section 16 - Other Information \*\*\*

**NFPA® Hazard Rating**

Health	1
Fire	2
Reactivity	0



**HMIS® Hazard Rating**

Health	1*	Slight
Fire	2	Moderate
Physical	0	Minimal

\*Chronic

# Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

## Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists; ADG = Australian Code for the Transport of Dangerous Goods by Road and Rail; ADR/RID = European Agreement of Dangerous Goods by Road/Rail; AS = Standards Australia; DFG = Deutsche Forschungsgemeinschaft; DOT = Department of Transportation; DSL = Domestic Substances List; EEC = European Economic Community; EINECS = European Inventory of Existing Commercial Chemical Substances; ELINCS = European List of Notified Chemical Substances; EU = European Union; HMIS = Hazardous Materials Identification System; IARC = International Agency for Research on Cancer; IMO = International Maritime Organization; IATA = International Air Transport Association; MAK = Maximum Concentration Value in the Workplace; NDSL = Non-Domestic Substances List; NFPA = National Fire Protection Association; NOHSC = National Occupational Health & Safety Commission; NTP = National Toxicology Program; STEL = Short-term Exposure Limit; TDG = Transportation of Dangerous Goods; TLV = Threshold Limit Value; TSCA = Toxic Substances Control Act; TWA = Time Weighted Average

## Literature References

None

## Other Information

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

End of Sheet



by Tyco Fire Suppression & Building Products

# MATERIAL SAFETY DATA SHEET

## ABC Fire Extinguisher

Issue Date: 04-13-2011

### 1. Product and Company Identification

<b>Material name</b>	ABC Fire Extinguisher
<b>Version #</b>	02
<b>Revision date</b>	04-13-2011
<b>CAS #</b>	Mixture
<b>Product use</b>	Fire Extinguisher
<b>Manufacturer / Importer / Supplier</b>	
<b>Name</b>	Tyco Fire Protection Products
<b>Address</b>	One Stanton Street Marinette, WI 54143-2542
<b>Phone</b>	715-732-3465
<b>Internet</b>	<a href="http://www.pyrochem.com">http://www.pyrochem.com</a>
<b>Emergency Phone Number</b>	CHEMTREC 800-424-9300 or 703-527-3887

### 2. Hazards Identification

<b>Emergency overview</b>	WARNING  Irritating to eyes and skin. Prolonged exposure may cause chronic effects.
<b>Potential health effects</b>	
<b>Routes of exposure</b>	Eye contact. Skin contact. Inhalation. Ingestion.
<b>Eyes</b>	Contact with eyes may cause irritation.
<b>Skin</b>	Avoid contact with the skin. May cause skin irritation.
<b>Inhalation</b>	Inhalation of dusts may cause respiratory irritation.
<b>Ingestion</b>	Not a likely route of entry.
<b>Target organs</b>	Eyes. Respiratory system. Skin.
<b>Signs and symptoms</b>	Irritation of eyes and mucous membranes.

### 3. Composition / Information on Ingredients

Non-hazardous components	CAS #	Percent
AMMONIUM HYDROGEN SULFATE	7783-20-2	10 - 30
Other components below reportable levels		> 60

### 4. First Aid Measures

<b>First aid procedures</b>	
<b>Eye contact</b>	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation persists after washing.
<b>Skin contact</b>	Wash off with warm water and soap. Get medical attention if irritation develops and persists.
<b>Inhalation</b>	Move to fresh air.
<b>Ingestion</b>	Rinse mouth. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.
<b>General advice</b>	If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

---

## 5. Fire Fighting Measures

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### Extinguishing media

**Suitable extinguishing media** This product is not flammable. Use extinguishing agent suitable for type of surrounding fire.

### Protection of firefighters

**Specific hazards arising from the chemical** None known.

**Protective equipment for firefighters** None known.

**Special protective equipment for fire-fighters** None known.

### Explosion data

**Sensitivity to mechanical impact** Not available.

**Sensitivity to static discharge** Not available.

**Hazardous combustion products** Carbon monoxide and carbon dioxide.

---

## 6. Accidental Release Measures

---

**Personal precautions** Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Avoid inhalation of dust from the spilled material. Wear a dust mask if dust is generated above exposure limits.

**Environmental precautions** Do not contaminate water.

**Methods for containment** If sweeping of a contaminated area is necessary use a dust suppressant agent which does not react with the product. Prevent entry into waterways, sewer, basements or confined areas.

**Methods for cleaning up** Should not be released into the environment. Sweep up or vacuum up spillage and collect in suitable container for disposal. Collect dust using a vacuum cleaner equipped with HEPA filter. Avoid the generation of dusts during clean-up. Clean up in accordance with all applicable regulations. Following product recovery, flush area with water.

**Other information** Clean up in accordance with all applicable regulations.

---

## 7. Handling and Storage

---

**Handling** Minimize dust generation and accumulation. Provide appropriate exhaust ventilation at places where dust is formed. Do not breathe dust. Avoid contact with eyes. Wash thoroughly after handling. Wear personal protective equipment.

**Storage** Guard against dust accumulation of this material. Use care in handling/storage.

---

## 8. Exposure Controls / Personal Protection

---

### Personal protective equipment

**Eye / face protection** Wear safety glasses with side shields (or goggles).

**Skin protection** Wear chemical protective equipment that is specifically recommended by the manufacturer. It may provide little or no thermal protection.

**Respiratory protection** In the case of respirable dust and/or fumes, use self-contained breathing apparatus.

---

## 9. Physical & Chemical Properties

---

### Appearance

**Form** Powder.

**Color** Yellow.

**Odor** Odorless.

**Physical state** Solid.

**pH** Not available.

**Melting point** Not available.

**Freezing point** Not available.

**Boiling point** Not available.

**Flash point** Not available.

---

<b>Evaporation rate</b>	Not available.
<b>Flammability limits in air, upper, % by volume</b>	Not available.
<b>Flammability limits in air, lower, % by volume</b>	Not available.
<b>Vapor pressure</b>	Not available.
<b>Vapor density</b>	Not available.
<b>Specific gravity</b>	Not available.
<b>Relative density</b>	Not available.
<b>Solubility (water)</b>	Not available.
<b>Partition coefficient (n-octanol/water)</b>	Not available.
<b>Auto-ignition temperature</b>	Not available.
<b>Decomposition temperature</b>	Not available.

---

## 10. Chemical Stability & Reactivity Information

<b>Chemical stability</b>	Material is stable under normal conditions.
<b>Incompatible materials</b>	Strong acids.
<b>Hazardous decomposition products</b>	Carbon oxides.

---

## 11. Toxicological Information

<b>Toxicological information</b>	The toxicity of this product has not been tested.
<b>Chronic effects</b>	Prolonged inhalation may be harmful. Not expected to be hazardous by WHMIS criteria.

---

## 12. Ecological Information

### Ecotoxicological data

Components	Test Results
AMMONIUM HYDROGEN SULFATE (7783-20-2)	EC50 Water flea ( <i>Ceriodaphnia dubia</i> ): 52 - 67 mg/l 48.00 hours LC50 Pink salmon ( <i>Oncorhynchus gorbuscha</i> ): 0.068 mg/l 96.00 hours

<b>Ecotoxicity</b>	This material is not expected to be harmful to aquatic life.
<b>Environmental effects</b>	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
<b>Persistence and degradability</b>	Not available.
<b>Partition coefficient (n-octanol/water)</b>	Not available.

---

## 13. Disposal Considerations

<b>Disposal instructions</b>	Dispose of contents/container in accordance with local/regional/national/international regulations. Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations.
<b>Waste from residues / unused products</b>	Dispose of in accordance with local regulations.

---

## 14. Transport Information

### TDG

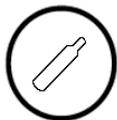
Not regulated as dangerous goods.

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## 15. Regulatory Information

<b>Canadian regulations</b>	This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.
<b>WHMIS status</b>	Controlled
<b>WHMIS classification</b>	A - Compressed Gas

## WHMIS labeling



### Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

\*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

## 16. Other Information

<b>Further information</b>	HMIS® is a registered trade and service mark of the NPCA.
<b>HMIS® ratings</b>	Health: 1* Flammability: 0 Physical hazard: 0
<b>NFPA ratings</b>	Health: 1 Flammability: 0 Instability: 0
<b>Disclaimer</b>	The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
<b>Issue date</b>	04-13-2011

# AMERADA HESS CORPORATION

## MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

### EMERGENCY OVERVIEW

#### DANGER!

**EXTREMELY FLAMMABLE - EYE AND MUCOUS MEMBRANE IRRITANT  
- EFFECTS CENTRAL NERVOUS SYSTEM - HARMFUL OR FATAL IF  
SWALLOWED - ASPIRATION HAZARD**



NFPA 704 (Section 16)

High fire hazard. Keep away from heat, spark, open flame, and other ignition sources.

If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs). Contact may cause eye, skin and mucous membrane irritation. Harmful if absorbed through the skin. Avoid prolonged breathing of vapors or mists. Inhalation may cause irritation, anesthetic effects (dizziness, nausea, headache, intoxication), and respiratory system effects.

Long-term exposure may cause effects to specific organs, such as to the liver, kidneys, blood, nervous system, and skin. Contains benzene, which can cause blood disease, including anemia and leukemia.

### 1. CHEMICAL PRODUCT and COMPANY INFORMATION (rev. Jan-04)

**Amerada Hess Corporation  
1 Hess Plaza  
Woodbridge, NJ 07095-0961**

**EMERGENCY TELEPHONE NUMBER (24 hrs):**

**CHEMTREC (800)424-9300**

**COMPANY CONTACT (business hours):**

Corporate Safety (732)750-6000

**MSDS Internet Website**

[www.hess.com/about/enviro.html](http://www.hess.com/about/enviro.html)

**SYNONYMS:** Hess Conventional (Oxygenated and Non-oxygenated) Gasoline; Reformulated Gasoline (RFG); Reformulated Gasoline Blendstock for Oxygenate Blending (RBOB); Unleaded Motor or Automotive Gasoline

See Section 16 for abbreviations and acronyms.

### 2. COMPOSITION and INFORMATION ON INGREDIENTS \* (rev. Jan-04)

INGREDIENT NAME (CAS No.)	CONCENTRATION PERCENT BY WEIGHT
Gasoline (86290-81-5)	100
Benzene (71-43-2)	0.1 - 4.9 (0.1 - 1.3 reformulated gasoline)
n-Butane (106-97-8)	< 10
Ethyl Alcohol (Ethanol) (64-17-5)	0 - 10
Ethyl benzene (100-41-4)	< 3
n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Tertiary-amyl methyl ether (TAME) (994-05-8)	0 to 17.2
Toluene (108-88-3)	1 - 25
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 - 15

A complex blend of petroleum-derived normal and branched-chain alkane, cycloalkane, alkene, and aromatic hydrocarbons. May contain antioxidant and multifunctional additives. Non-oxygenated Conventional Gasoline and RBOB do not have oxygenates (Ethanol or MTBE and/or TAME). Oxygenated Conventional and Reformulated Gasoline will have oxygenates for octane enhancement or as legally required.

# AMERADAHESSE CORPORATION

## MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

### 3. HAZARDS IDENTIFICATION (rev. Dec-97)

#### **EYES**

Moderate irritant. Contact with liquid or vapor may cause irritation.

#### **SKIN**

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are exposed repeatedly.

#### **INGESTION**

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

#### **INHALATION**

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

**WARNING:** the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

#### **CHRONIC EFFECTS and CARCINOGENICITY**

Contains benzene, a regulated human carcinogen. Benzene has the potential to cause anemia and other blood diseases, including leukemia, after repeated and prolonged exposure. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with systemic toxicity. See also Section 11 - Toxicological Information.

#### **MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE**

Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash). Chronic respiratory disease, liver or kidney dysfunction, or pre-existing central nervous system disorders may be aggravated by exposure.

### 4. FIRST AID MEASURES (rev. Dec-97)

#### **EYES**

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

#### **SKIN**

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops.

#### **INGESTION**

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

#### **INHALATION**

Remove person to fresh air. If person is not breathing, ensure an open airway and provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

# AMERADAHESSE CORPORATION

## MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

### 5. FIRE FIGHTING MEASURES (rev. Dec-97)

#### **FLAMMABLE PROPERTIES:**

FLASH POINT:	-45 °F (-43°C)
AUTOIGNITION TEMPERATURE:	highly variable; > 530 °F (>280 °C)
OSHA/NFPA FLAMMABILITY CLASS:	1A (flammable liquid)
LOWER EXPLOSIVE LIMIT (%):	1.4%
UPPER EXPLOSIVE LIMIT (%):	7.6%

#### **FIRE AND EXPLOSION HAZARDS**

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

#### **EXTINGUISHING MEDIA**

**SMALL FIRES:** Any extinguisher suitable for Class B fires, dry chemical, CO<sub>2</sub>, water spray, fire fighting foam, or Halon.

**LARGE FIRES:** Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

During certain times of the year and/or in certain geographical locations, gasoline may contain MTBE and/or TAME. Firefighting foam suitable for polar solvents is recommended for fuel with greater than 10% oxygenate concentration - refer to NFPA 11 "Low Expansion Foam - 1994 Edition."

#### **FIRE FIGHTING INSTRUCTIONS**

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 16 for the NFPA 704 Hazard Rating.

### 6. ACCIDENTAL RELEASE MEASURES (rev. Dec-97)

ACTIVATE FACILITY SPILL CONTINGENCY or EMERGENCY PLAN.

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product

# AMERADA HESS CORPORATION

## MATERIAL SAFETY DATA SHEET

**Gasoline, All Grades**

**MSDS No. 9950**

vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

### 7. HANDLING and STORAGE (rev. Dec-97)

#### HANDLING PRECAUTIONS

\*\*\*\*\*USE ONLY AS A MOTOR FUEL\*\*\*\*\*

\*\*\*\*\*DO NOT SIPHON BY MOUTH\*\*\*\*\*

Handle as a flammable liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents.

#### STORAGE PRECAUTIONS

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

#### WORK/HYGIENIC PRACTICES

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

### 8. EXPOSURE CONTROLS and PERSONAL PROTECTION (rev. Jan-04)

#### EXPOSURE LIMITS

Component (CAS No.)	Source	Exposure Limits			Note
		TWA (ppm)	STEL (ppm)		
Gasoline (86290-81-5)	ACGIH	300	500	A3	
Benzene (71-43-2)	OSHA	1	5	Carcinogen	
	ACGIH	0.5	2.5	A1, skin	
	USCG	1	5		
n-Butane (106-97-8)	ACGIH	800	--	2003 NOIC: 1000 ppm (TWA) Aliphatic Hydrocarbon Gases Alkane (C1-C4)	
Ethyl Alcohol (ethanol) (64-17-5)	OSHA	1000	--		
	ACGIH	1000	--	A4	
Ethyl benzene (100-41-4)	OSHA	100	--		
	ACGIH	100	125	A3	

# AMERADA HESS CORPORATION

## MATERIAL SAFETY DATA SHEET

**Gasoline, All Grades**

**MSDS No. 9950**

Component (CAS No.)	Source	TWA (ppm)	STEL (ppm)	Exposure Limits	Note
n-Hexane (110-54-3)	OSHA	500	--		
	ACGIH	50	--	skin	
Methyl-tertiary butyl ether [MTBE] (1634-04-4)	ACGIH	50		A3	
Tertiary-amyl methyl ether [TAME] (994-05-8)				None established	
Toluene (108-88-3)	OSHA	200		Ceiling: 300 ppm; Peak: 500 ppm (10 min.)	
	ACGIH	50	--	A4 (skin)	
1,2,4-Trimethylbenzene (95-63-6)	ACGIH	25	--		
Xylene, mixed isomers (1330-20-7)	OSHA	100	--		
	ACGIH	100	150	A4	

### **ENGINEERING CONTROLS**

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

### **EYE/FACE PROTECTION**

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

### **SKIN PROTECTION**

Gloves constructed of nitrile or neoprene are recommended. Chemical protective clothing such as that made of of E.I. DuPont Tychem®, products or equivalent is recommended based on degree of exposure.

Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

### **RESPIRATORY PROTECTION**

A NIOSH-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection and limitations.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

## **9. PHYSICAL and CHEMICAL PROPERTIES (rev. Jan-04)**

### **APPEARANCE**

A translucent, straw-colored or light yellow liquid

### **ODOR**

A strong, characteristic aromatic hydrocarbon odor. Oxygenated gasoline with MTBE and/or TAME may have a sweet, ether-like odor and is detectable at a lower concentration than non-oxygenated gasoline.

### **ODOR THRESHOLD**

	<u>Odor Detection</u>	<u>Odor Recognition</u>
Non-oxygenated gasoline:	0.5 - 0.6 ppm	0.8 - 1.1 ppm
Gasoline with 15% MTBE:	0.2 - 0.3 ppm	0.4 - 0.7 ppm
Gasoline with 15% TAME:	0.1 ppm	0.2 ppm

### **BASIC PHYSICAL PROPERTIES**

BOILING RANGE:	85 to 437 °F (39 to 200 °C)
VAPOR PRESSURE:	6.4 - 15 RVP @ 100 °F (38 °C) (275-475 mm Hg @ 68 °F (20 °C)
VAPOR DENSITY (air = 1):	AP 3 to 4
SPECIFIC GRAVITY (H <sub>2</sub> O = 1):	0.70 – 0.78
EVAPORATION RATE:	10-11 (n-butyl acetate = 1)
PERCENT VOLATILES:	100 %

# AMERAD HESS CORPORATION

## MATERIAL SAFETY DATA SHEET

**Gasoline, All Grades**

**MSDS No. 9950**

SOLUBILITY (H<sub>2</sub>O): Non-oxygenated gasoline - negligible (< 0.1% @ 77 °F). Gasoline with 15% MTBE - slight (0.1 - 3% @ 77 °F); ethanol is readily soluble in water

### 10. STABILITY and REACTIVITY (rev. Dec-94)

**STABILITY:** Stable. Hazardous polymerization will not occur.

#### **CONDITIONS TO AVOID**

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources

#### **INCOMPATIBLE MATERIALS**

Keep away from strong oxidizers.

#### **HAZARDOUS DECOMPOSITION PRODUCTS**

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitrocresols that can decompose violently.

### 11. TOXICOLOGICAL PROPERTIES (rev. Dec-97)

#### **ACUTE TOXICITY**

Acute Dermal LD50 (rabbits): > 5 ml/kg

Acute Oral LD50 (rat): 18.75 ml/kg

Primary dermal irritation (rabbits): slightly irritating

Draize eye irritation (rabbits): non-irritating

Guinea pig sensitization: negative

#### **CHRONIC EFFECTS AND CARCINOGENICITY**

Carcinogenicity: OSHA: NO IARC: YES - 2B

NTP: NO

ACGIH: YES (A3)

IARC has determined that gasoline and gasoline exhaust are possibly carcinogenic in humans. Inhalation exposure to completely vaporized unleaded gasoline caused kidney cancers in male rats and liver tumors in female mice. The U.S. EPA has determined that the male kidney tumors are species-specific and are irrelevant for human health risk assessment. The significance of the tumors seen in female mice is not known. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with effects to the central and peripheral nervous systems, liver, and kidneys. The significance of these animal models to predict similar human response to gasoline is uncertain.

This product contains benzene. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-forming system (particularly bone marrow), and serious blood disorders such as aplastic anemia and leukemia. Benzene is listed as a human carcinogen by the NTP, IARC, OSHA and ACGIH.

This product may contain methyl tertiary butyl ether (MTBE): animal and human health effects studies indicate that MTBE may cause eye, skin, and respiratory tract irritation, central nervous system depression and neurotoxicity. MTBE is classified as an animal carcinogen (A3) by the ACGIH.

### 12. ECOLOGICAL INFORMATION (rev. Jan-04)

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations. If released, oxygenates such as ethers and alcohols will be expected to exhibit fairly high mobility in soil, and therefore may leach into groundwater. The API ([www.api.org](http://www.api.org)) provides a number of useful references addressing petroleum and oxygenate contamination of groundwater.

### 13. DISPOSAL CONSIDERATIONS (rev. Dec-97)

Consult federal, state and local waste regulations to determine appropriate disposal options.

# AMERADAHESSCORPORATION

## MATERIAL SAFETY DATA SHEET

**Gasoline, All Grades**

**MSDS No. 9950**

**14. TRANSPORTATION INFORMATION** (rev. Jan-04)

DOT PROPER SHIPPING NAME: Gasoline  
 DOT HAZARD CLASS and PACKING GROUP: 3, PG II  
 DOT IDENTIFICATION NUMBER: UN 1203  
 DOT SHIPPING LABEL: FLAMMABLE LIQUID

PLACARD:



**15. REGULATORY INFORMATION** (rev. Jan-04)

**U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION**

This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other federal, state, or local regulations; consult those regulations applicable to your facility/operation.

**CLEAN WATER ACT (OIL SPILLS)**

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) or, if not practical, the U.S. Coast Guard with follow-up to the National Response Center, as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

**CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)**

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

**SARA SECTION 311/312 - HAZARD CLASSES**

<u>ACUTE HEALTH</u>	<u>CHRONIC HEALTH</u>	<u>FIRE</u>	<u>SUDDEN RELEASE OF PRESSURE</u>	<u>REACTIVE</u>
X	X	X	--	--

**SARA SECTION 313 - SUPPLIER NOTIFICATION**

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

<u>INGREDIENT NAME (CAS NUMBER)</u>	<u>CONCENTRATION WT. PERCENT</u>
Benzene (71-43-2)	0.1 to 4.9 (0.1 to 1.3 for reformulated gasoline)
Ethyl benzene (100-41-4)	< 3
n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Toluene (108-88-3)	1 to 15
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 to 15

US EPA guidance documents ([www.epa.gov/tri](http://www.epa.gov/tri)) for reporting Persistent Bioaccumulating Toxics (PBTs) indicate this product may contain the following deminimis levels of toxic chemicals subject to Section 313 reporting:

<u>INGREDIENT NAME (CAS NUMBER)</u>	<u>CONCENTRATION - Parts per million (ppm) by weight</u>
Polycyclic aromatic compounds (PACs)	17
Benzo (g,h,i) perylene (191-24-2)	2.55
Lead (7439-92-1)	0.079

# AMERADAHESSCORPORATION

## MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

### CANADIAN REGULATORY INFORMATION (WHMIS)

Class B, Division 2 (Flammable Liquid)

Class D, Division 2A (Very toxic by other means) and Class D, Division 2B (Toxic by other means)

### 16. OTHER INFORMATION (rev. Jan-04)

**NFPA® HAZARD RATING** HEALTH: 1 Slight  
FIRE: 3 Serious  
REACTIVITY: 0 Minimal

**HMIS® HAZARD RATING** HEALTH: 1 \* Slight  
FIRE: 3 Serious  
REACTIVITY: 0 Minimal  
\* CHRONIC

**SUPERSEDES MSDS DATED:** 12/30/97

### ABBREVIATIONS:

AP = Approximately < = Less than > = Greater than  
N/A = Not Applicable N/D = Not Determined ppm = parts per million

### ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists	NTP	National Toxicology Program
		OPA	Oil Pollution Act of 1990
AIHA	American Industrial Hygiene Association	OSHA	U.S. Occupational Safety & Health Administration
ANSI	American National Standards Institute (212)642-4900	PEL	Permissible Exposure Limit (OSHA)
API	American Petroleum Institute (202)682-8000	RCRA	Resource Conservation and Recovery Act
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act	REL	Recommended Exposure Limit (NIOSH)
DOT	U.S. Department of Transportation [General Info: (800)467-4922]	SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
EPA	U.S. Environmental Protection Agency	SCBA	Self-Contained Breathing Apparatus
HMIS	Hazardous Materials Information System	SPCC	Spill Prevention, Control, and Countermeasures
IARC	International Agency For Research On Cancer	STEL	Short-Term Exposure Limit (generally 15 minutes)
MSHA	Mine Safety and Health Administration	TLV	Threshold Limit Value (ACGIH)
NFPA	National Fire Protection Association (617)770-3000	TSCA	Toxic Substances Control Act
NIOSH	National Institute of Occupational Safety and Health	TWA	Time Weighted Average (8 hr.)
NOIC	Notice of Intended Change (proposed change to ACGIH TLV)	WEEL	Workplace Environmental Exposure Level (AIHA)
		WHMIS	Workplace Hazardous Materials Information System (Canada)

### **DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES**

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.



**MATERIAL SAFETY DATA SHEET (MSDS)**  
**FOR PELLETIZED LIMESTONE**

(Complies with OSHA's Hazard Communication Standard, 29 CFR 1910.1200)

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## Section 1 - IDENTIFICATION

### Supplier/Manufacturer

Oldcastle® Stone Products  
550 S. Biesecker Road  
Thomasville, PA 17364

### Emergency Contact Information

(717) 792-2631 (Laboratory - Ext. 235)

### Product name and synonyms

Limestone Pellets, Pelletized Limestone, Pelletized Lime, Pellet Lime, Calcitic Pellets, YardRight, Clean Lime

### Chemical family

Limestone/Dolomite (CAS #1317-65-3)

### Formula

CaCO<sub>3</sub> – (52.0-87.0%)

MgCO<sub>3</sub> – (12.0-40.0%)

Sodium Carbonate Lignin (CAS#8061-51-6)

Ammonium Lignin Sulfonate (CAS#8061-53-8)

Sodium Lignin Sulfonate (CAS#8061-51-6)

(3-5%) See accompanying Material Safety Data Sheet

---

## Section 2 - COMPONENTS

### Hazardous Ingredients

Respirable quartz (CAS# 14808-60-7) – greater than 0.1% by weight

ACGIH TLV-TWA (1997) = 0.10 mg respirable quartz dust/m<sup>3</sup>

OSHA PEL (8-hour TWA) = (10 mg respirable dust/m<sup>3</sup>)/(percent silica + 2)

NIOSH REL (8-hour TWA) = 0.05 mg respirable dust/m<sup>3</sup>

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## Section 3 - HAZARD IDENTIFICATION

### Potential Health Effects

#### **Relevant Routes of Exposure:**

Eye contact, skin contact, inhalation, and ingestion.

#### **Effects Resulting from Eye Contact:**

Exposure to airborne dust may cause immediate or delayed irritation or inflammation. Eye contact by large amounts of dry powder or splashes of wet limestone dust may cause effects ranging from moderate eye irritation to chemical burns or blindness. Such exposures may require immediate first aid (see Section 4) and medical attention to prevent damage to the eye.

#### **Effects Resulting from Skin Contact:**

Direct contact may cause irritation by mechanical abrasion.

#### **Effects Resulting from Inhalation:**

Limestone may contain trace amounts of free crystalline silica. Prolonged exposure to respirable free silica can aggravate other lung conditions and cause silicosis, a disabling and potentially fatal lung disease.

Exposure to limestone dust may cause irritation to the moist mucous membranes of the nose, throat, and upper respiratory system. It may also leave unpleasant deposits in the nose.

#### **Effects Resulting from Ingestion:**

Although small quantities of dust are not known to be harmful, ill effects are possible if larger quantities are consumed.

#### **Carcinogenic potential:**

Limestone is **not** listed as a carcinogen by NTP, OSHA, or IARC. It may however, contain trace amounts of substances listed as carcinogens by these organizations.

Crystalline silica, which is a component of limestone, is now classified by IARC as known human carcinogen (Group I). NTP has characterized respirable silica as "reasonably anticipated to be [a] carcinogen".

**Medical conditions which may be aggravated by inhalation or dermal exposure:**

Pre-existing upper respiratory and lung diseases.

---

**Section 4 - FIRST AID**

Eyes

Immediately flush eyes thoroughly with water. Continue flushing eye for at least 15 minutes, including under lids, to remove all particles. Call physician if irritation persists or later develops.

Skin

Wash skin with cool water and pH-neutral soap or a mild detergent. Seek medical treatment if irritation persists or later develops.

Inhalation of Airborne Dust

Remove to fresh air. Seek medical help if coughing and other symptoms do not subside.

Ingestion

Do not induce vomiting. If conscious, have the victim drink plenty of water and call a physician immediately.

---

**Section 5 - FIRE AND EXPLOSION DATA**

Flash point .....	None	Lower Explosive Limit.....	None
Upper Explosive Limit.....	None	Auto ignition temperature.....	Not Combustible
Extinguishing media.....	Not Combustible	Special fire fighting Procedures.....	None
Hazardous combustion products..	None	Unusual fire and explosion hazards.....	None

---

**Section 6 - ACCIDENTAL RELEASE MEASURES**

Collect dry material using a scoop. Avoid actions that cause dust to become airborne. Avoid inhalation of dust and contact with skin.

None of the components of this product are subject to the reporting requirements of Title III of SARA 1986, and 40 CFR 372.

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**Section 7 - HANDLING AND STORAGE**

Follow the personal protection and controls set forth in Section 8 of this MSDS when handling this product. Respirable crystalline silica-containing dust may be generated during processing, handling and storage.

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**Section 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION**

Skin Protection

Wash dust-exposed skin with soap and water before eating, drinking, smoking, and using the toilet facilities. Wash work cloths after each use.

Respiratory Protection

Avoid actions that cause dust to become airborne. Use local or general exhaust ventilation to control exposures below applicable exposure limits.

Use NIOSH/MSHA approved (under 30 CFR 11) or NIOSH approved (under 42 CFR 84) respirators in poorly ventilated areas, if an applicable exposure limit is exceeded, or when dust causes discomfort or irritation. (Advisory: Respirators and filters purchased after June 10, 1998 must be certified under 42 CFR 84.)

Ventilation

Use local exhaust or general dilution ventilation to control exposure within applicable limits.

Eye Protection

Safety glasses with side shields should be worn as minimum protection. In extremely dusty environments and unpredictable environments wear unvented or indirectly vented goggles to avoid eye irritation or injury. Contact lenses should not be worn when working with products which may generate airborne dust.

---

**Section 9 - PHYSICAL AND CHEMICAL, PROPERTIES**

Physical state.....	Pourous	Odor.....	Binder may have a slight scent (lignin)
Solubility in water...	Limestone - Negligible	Vapor pressure.....	Not applicable
	Binder (Lignin) – High	Evaporation rate.....	Not applicable
Vapor density.....	Not applicable	Boiling point.....	Not applicable (i.e., > 1000 C)

Melting point.....Not applicable

Specific gravity (H2O = 1.0).....2.55-2.85

---

## Section 10 - STABILITY AND REACTIVITY

### Stability

Stable.

### Conditions to avoid

Avoid contact with incompatible materials (see below).

### Incompatibility

Materials to avoid include; powerful oxidizing agents such as flouride, boron triflouride, chlorine triflouride, manganese triflouride, and oxygen deflouride. Contact of these materials may cause fire and/or explosions. Silica dissolves n hydroflouric acid producing a corrosive gas – silicon tetraflouride.

### Hazardous decomposition

Will not spontaneously occur. Silica-containing respirable dust particles may be generated by handling.

### Hazardous Polymerization

Will not occur.

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## Section 11 - TOXICOLOGICAL INFORMATION

For a description of available, more detailed toxicological information contact the supplier or manufacturer.

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## Section 12 - ECOLOGICAL INFORMATION

### Ecotoxicity

No recognized unusual toxicity to plants or animals

### Relevant physical and chemical properties

(See Sections 9 and 10.)

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## Section 13 - DISPOSAL

Pickup and reuse clean materials. Dispose of waste materials in accordance with applicable federal, state, and local laws and regulations.

Where applicable, dispose of bags in an approved landfill or incinerator.

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## Section 14 - TRANSPORTATION DATA

### Hazardous materials description/proper shipping name

Not hazardous under U.S. Department of Transportation (DOT) regulations.

### Hazard class

Not applicable.

### Identification number

Not applicable

### Required label text

Not applicable.

### Hazardous substances/reportable quantities (RQ)

Not applicable.

---

## Section 15 - OTHER REGULATORY INFORMATION

### Status under USDOL-OSHA Hazard Communication Rule, 29 CFR 1910.1200

Pelletized limestone is considered a "hazardous chemical" under this regulation, and should be part of any hazard communication program.

### Status under CERCLA/SUPERFUND 40 CFR 117 and 302

Not listed.

### Hazard Category under SARA(Title III), Sections 311 and 312

Pelletized limestone qualifies as a "hazardous substance" with delayed health effects.

Status under SARA (Title III), Section 313

Not subject to reporting requirements under Section 313.

Status under TSCA (as of May 1997)

Some substances in limestone are on the TSCA inventory list.

Status under the Federal Hazardous Substances Act

Pelletized limestone is a "hazardous substance" subject to statutes promulgated under the subject act.

Status under California Proposition 65

This product contains up to 0.05 percent of chemicals (trace elements) known to the State of California to cause cancer, birth defects or other reproductive harm. California law requires the manufacturer to give the above warning in the absence of definitive testing to prove that the defined risks do not exist.

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**Section 16 - OTHER INFORMATION**

Prepared by

Lance Griffin  
Plant Manager  
Oldcastle® Stone Products  
550 S. Biesecker Road

Thomasville,

PA. 17364

(717) 792 - 2631

Approval date or Revision date

Approved: February, 1999

Revised: October, 2002

Other important information

This product should only be used by knowledgeable persons. While the information provided in this material safety data sheet is believed to provide a useful summary of the hazards this product as it is commonly used, the sheet cannot anticipate and provide the all of the information that might be needed in every situation. Inexperienced product users should obtain proper training before using this product.

SELLER MAKES NO WARRANTY, EXPRESSED OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE OR CONCERNING THE ACCURACY OF ANY INFORMATION PROVIDED BY Oldcastle® Stone Products except that the product shall conform to contracted specifications. The information provided herein was believed by Oldcastle® Stone Products to be accurate at the time of preparation or prepared from sources believed to be reliable, but it is the responsibility of the user to investigate and understand other pertinent sources of information to comply with all laws and procedures applicable to the safe handling and use of product and to determine the suitability of the product for its intended use. Buyer's exclusive remedy shall be for damages and no claim of any kind, whether as to product delivered or for non-delivery of product, and whether based on contract, breach of warranty, negligence, or otherwise shall be greater in amount than the purchase price of the quantity of product in respect of which damages are claimed. In no event shall Seller be liable for incidental or consequential damages, whether Buyer's claim is based on contract, breach of warranty, negligence or otherwise.



## Material Safety Data Sheet

Issue Date: October 27, 2008

Revised Date: March 20, 2013

Reason: Revised to Current Date.

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product name:** Super Lube® Grease

**Item No's:** 82340, 21006, 21010, 21030, 21036, 41150, 41160, 41050, 41030, 41120, 41140, 21013, 21014, 21015, 11520  
/1, /0, /00, /000 identifies NLGI-1, 0, 00, or 000 consistency.

**Product use:** Lubricant

**Company address:**

Synco Chemical Corporation  
24 DaVinci Dr., P.O. Box 405  
Bohemia, NY 11716

**Contact Information:**

Telephone: 631-567-5300  
Emergency telephone: 800-424-9300  
Internet: [www.super-lube.com](http://www.super-lube.com)  
E-Mail: [info@super-lube.com](mailto:info@super-lube.com)

### 2. HAZARDS IDENTIFICATION

#### EMERGENCY OVERVIEW

**Physical state:** Semi-solid

**Color:** Translucent

**Odor:** Mild

**WARNING:**

MAY CAUSE SKIN OR EYE IRRITATION

**WHMIS hazard class:** Not Hazardous

**HMIS codes:** Health - 0

Fire - 1

Hazard - 0

Other - 0

**Relevant routes of exposure:**

Skin, Eyes

**Potential Health Effects**

**Inhalation:**

Not expected to cause respiratory tract irritation during normal conditions of use.

**Skin contact:**

Repeated or prolonged contact may be irritating to skin.

**Eye contact:**

Contact with eyes may cause irritation.

**Ingestion:**

Not expected under normal conditions of use.

**Existing conditions aggravated by exposure:**

None generally recognized.

**See Section 11 for additional toxicological information.**

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

<u>Components</u>	<u>%</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>	<u>OTHER</u>
Polyalphaolefin 68037-01-4	<85	5mg/m <sup>3</sup> TWA (mist:) 10mg/m <sup>3</sup> STEL (mist:)	5mg/m <sup>3</sup> TWA (mist:)	None
White mineral oil (petroleum) 8042-47-5	<25	5mg/m <sup>3</sup> TWA (mist:) 10mg/m <sup>3</sup> STEL (mist:)	5mg/m <sup>3</sup> TWA (mist:)	None
Fumed Silica 68611-44-9	<5	10mg/m <sup>3</sup> TWA	6mg/m <sup>3</sup> TWA	None
Polytetrafluoroethylene 9002-84-0	<4	Not established	Not established	None
Antioxidant 41484-35-9	<2	Not established	Not established	None
Polyglycol 025322-69-4	<1			AIHA WEEL is 50 ppm Total 10mg/m <sup>3</sup> aerosol only
Polyisobutylene 9003-27-4	<0.5	Not established	Not established	None

### 4. FIRST AID MEASURES

<b>Inhalation:</b>	Remove to fresh air. If discomfort persists seek medical attention.
<b>Skin contact:</b>	After contact with skin, wash immediately with plenty of water. Immediately flush skin with plenty of water (using soap, if available). Get medical attention if symptoms develop and persist.
<b>Eye contact:</b>	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.
<b>Ingestion:</b>	Do not induce vomiting. Get medical attention.

### 5. FIRE-FIGHTING MEASURES

<b>Flash point:</b>	>428° F (220° C) COC
<b>Auto ignition temperature:</b>	Not available
<b>Flammable/Explosive limits-lower %:</b>	N/A

**Flammable/Explosive limits-upper %:** N/A

**Extinguishing media:** Carbon dioxide (CO<sub>2</sub>). Dry chemical. Foam.

**Special fire fighting procedures:** None

**Unusual fire or explosion hazards:** None

**Hazardous combustion products:** Oxides of carbon.

**Sensitivity to mechanical impact:** Not available

**Sensitivity to static discharge:** Not available

## 6. ACCIDENTAL RELEASE MEASURES

**Environmental precautions:** No special precautions required.

**Clean-up methods:** Scrape up and dispose of in accordance with local and national regulations.

## 7. HANDLING AND STORAGE

**Handling:** Good manufacturing procedures should be followed in handling and storage.

**Storage:** Keep in cool, dry area.

**Incompatible products:** Oxidizing agents.

## Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

**Engineering controls:** Local exhaust ventilation is recommended when general ventilation is not sufficient to control airborne contamination below occupational exposure limits.

**Respiratory protection:** If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted, NIOSH approved, organic vapor/particulate respirator.

**Skin protection:** Nitrile or PVC, impermeable gloves.

**Eye/face protection:** Safety glasses with side-shields.

**See Section 3 for exposure limits.**

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Physical state:</b>	Semi-solid
<b>Color:</b>	Translucent
<b>Odor:</b>	Mild
<b>Odor Threshold:</b>	Not determined
<b>Vapor pressure:</b>	Not determined
<b>pH:</b>	Not determined
<b>Boiling point/range:</b>	Not applicable
<b>Melting point/range:</b>	None
<b>Specific gravity:</b>	.89
<b>Vapor density:</b>	Not available
<b>Evaporation rate:</b>	Not available
<b>Solubility in water:</b>	Not soluble
<b>Partition coefficient (n-octano/water):</b>	Not determined
<b>VOC content:</b>	Essentially zero

## 10. STABILITY AND REACTIVITY

<b>Stability:</b>	Stable
<b>Hazardous polymerization:</b>	Will not occur.
<b>Hazardous decomposition products:</b>	None under normal use.
<b>Incompatibility:</b>	Oxidizing agents.
<b>Conditions to avoid:</b>	None known

## 11. TOXICOLOGICAL INFORMATION

**Product toxicity data:** Not Toxic

**Toxicologically synergistic products:** Not available

**Refer to the following for irritancy of Product, Sensitization to Product, Carcinogenicity, Reproductive Toxicity, Teratogenicity, and Mutagenicity.**

### Ingredient Toxicity Data & Carcinogen Status

Components	LD50s & LC50s	Other LD50s and LC50s	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen	ACGIH-Carcinogen
Polyalphaolefin Proprietary	None	None	No	No	No	No
MineralOil(petroleum) 8042475	OralLD50(Rat) >5000mg/kg	None	No	No	No	No

Antioxidant 41484-35-9	Oral LD50 (Rat) >5000 mg/kg Dermal LD50(Rabbit) >3000 mg/kg Inhalation LC50 (Rat) >3.5 mg/m <sup>3</sup>	None	No	No	No	No
Fumed Silica 68611-44-9	Oral LD50 (Rat) >5000 mg/kg	None	No	No	No	No
Polytetra- fluoroethylene 9002-84-0	Not determined	None	No	No	No	No
Polyglycol 025322-69-4	Oral LD50 (Rats) >10,000 mg/kg Dermal LD50 (Rabbit) >10,000 mg/kg	None	No	No	No	No

### Literature Referenced Target Organ & Other Health Effects

Components	Health Effects/Target Organs
Polyalphaolefin Proprietary	No target organs
White mineral oil (petroleum) 8042-47-5	Irritant
Antioxidant 41484-35-6	No target organs
Fumed Silica 68611-44-6	Nuisance dust, irritant to eyes and skin
Polytetrafluoroethylene 9002-84-0	Irritant
Polyglycol 025322-69-4	No target organs

## 12. ECOLOGICAL INFORMATION

**Ecological information:**

General Notes: Water hazard class 1 (self assessment): slightly hazardous for water. Do not allow undiluted product or large quantities of it to reach ground or sewage systems.

## 13. DISPOSAL CONSIDERATIONS

**Information provided is for unused product only.**

**Recommended method of disposal:** Dispose of in accordance with federal and local regulations.

## 14. TRANSPORT INFORMATION

### Transportation of Dangerous Goods – Ground:

<b>Proper shipping name:</b>	Not regulated
<b>Hazardous class or division:</b>	None
<b>Identification number:</b>	None
<b>Packing group:</b>	None

### International Air Transportation (ICAO/IATA):

<b>Proper shipping name:</b>	Not regulated
<b>Hazardous class or division:</b>	None
<b>Identification number:</b>	None
<b>Packing group:</b>	None

### Water Transportation (IMO/IMDG):

<b>Proper shipping name:</b>	Not regulated
<b>Hazardous class or division:</b>	None
<b>Identification number:</b>	None
<b>Packing group:</b>	None
<b>Marine pollutant:</b>	None

## 15. REGULATORY INFORMATION

### Canada Regulatory Information

**CEPA DSL/NDL Status:** All components are listed on or are exempt from listing on the Domestic Substances List.

### United States Regulatory Information

**TSCA 8 (b) Inventory Status:** All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.

### New Zealand Regulatory Information

**New Zealand HSNO Status:** All components are listed or are exempt from listing on the Hazardous Substances and New Organisms Act.

### European Union Regulatory Information

**Regulation No. 1907/2006 (REACH):** Components are Pre-registered and in compliance.

## SECTION 16: OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Product Regulations.

Data prepared by Environment protection department.



## SAFETY DATA SHEET

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : **Tri-ACT® 1820**

APPLICATION : CORROSION INHIBITOR

COMPANY IDENTIFICATION :  
Nalco Company  
1601 W. Diehl Road  
Naperville, Illinois  
60563-1198

EMERGENCY TELEPHONE NUMBER(S) : (800) 424-9300 (24 Hours) CHEMTREC

NFPA 704M/HMIS RATING

HEALTH : 3/3 FLAMMABILITY : 2/2 INSTABILITY : 0/0 OTHER :  
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme \* = Chronic Health Hazard

### 2. COMPOSITION/INFORMATION ON INGREDIENTS

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

Hazardous Substance(s)	CAS NO	% (w/w)
Cyclohexylamine	108-91-8	10.0 - 30.0
Diethylethanolamine	100-37-8	5.0 - 10.0
Morpholine	110-91-8	5.0 - 10.0

### 3. HAZARDS IDENTIFICATION

#### \*\*EMERGENCY OVERVIEW\*\*

#### DANGER

Corrosive. May cause tissue damage. Combustible. Harmful in contact with skin and if swallowed Vapors may have a strong offensive odor which may cause sensory response including headache, nausea and vomiting. Irritating to respiratory system.

Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. Keep away from heat. Keep away from sources of ignition - No smoking. Keep container tightly closed. Avoid breathing vapor. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water. Use a mild soap if available. Protect product from freezing.

Wear a face shield. Wear chemical resistant apron, chemical splash goggles, impervious gloves and boots.

Combustible Liquid; may form combustible mixtures at or above the flash point. May evolve oxides of carbon (CO<sub>x</sub>) under fire conditions. May evolve oxides of nitrogen (NO<sub>x</sub>) under fire conditions. Empty product containers may contain product residue. Do not pressurize, cut, heat, weld, or expose containers to flame or other sources of ignition.

PRIMARY ROUTES OF EXPOSURE :  
Eye, Skin, Inhalation



## SAFETY DATA SHEET

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :

Corrosive. Will cause eye burns and permanent tissue damage. Exposure to low vapor concentrations can result in foggy or blurred vision, objects appearing bluish and appearance of a halo around lights. These symptoms are temporary.

SKIN CONTACT :

Corrosive; causes permanent skin damage. Harmful if absorbed through skin.

INGESTION :

Not a likely route of exposure. Corrosive; causes chemical burns to the mouth, throat and stomach. Harmful if swallowed.

INHALATION :

Irritating, in high concentrations, to the eyes, nose, throat and lungs. Vapors may have a strong offensive odor which may cause sensory response including headache, nausea and vomiting.

AGGRAVATION OF EXISTING CONDITIONS :

A review of available data does not identify any worsening of existing conditions.

HUMAN HEALTH HAZARDS - CHRONIC :

Prolonged exposure to cyclohexylamine in the diet has produced reproductive effects in rats. The relevance to humans is unknown.

## 4. FIRST AID MEASURES

EYE CONTACT :

Immediately flush eye with water for at least 15 minutes while holding eyelids open. PROMPT ACTION IS ESSENTIAL IN CASE OF CONTACT. Get immediate medical attention.

SKIN CONTACT :

Immediately flush with plenty of water for at least 15 minutes. Use a mild soap if available. For a large splash, flood body under a shower. Get immediate medical attention. Contaminated clothing, shoes, and leather goods must be discarded or cleaned before re-use.

INGESTION :

Get immediate medical attention. DO NOT INDUCE VOMITING. If conscious, washout mouth and give water to drink.

INHALATION :

Remove to fresh air, treat symptomatically. Get immediate medical attention.

NOTE TO PHYSICIAN :

Probable mucosal damage may contraindicate the use of gastric lavage. Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition.



## SAFETY DATA SHEET

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

### 5. FIRE FIGHTING MEASURES

FLASH POINT : 131 °F / 55 °C ( PMCC )

EXTINGUISHING MEDIA :

Dry powder, Carbon dioxide, Foam, Other extinguishing agent suitable for Class B fires, For large fires, use water spray or fog, thoroughly drenching the burning material.

Keep containers cool by spraying with water.

FIRE AND EXPLOSION HAZARD :

Combustible Liquid; may form combustible mixtures at or above the flash point. May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) under fire conditions. Empty product containers may contain product residue. Do not pressurize, cut, heat, weld, or expose containers to flame or other sources of ignition.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :

In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

### 6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS :

Restrict access to area as appropriate until clean-up operations are complete. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Stop or reduce any leaks if it is safe to do so. Keep people away from and upwind of spill/leak. Ventilate spill area if possible. Remove sources of ignition. Ensure clean-up is conducted by trained personnel only. Do not touch spilled material. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Notify appropriate government, occupational health and safety and environmental authorities.

METHODS FOR CLEANING UP :

SMALL SPILLS: Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. LARGE SPILLS: Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Wash site of spillage thoroughly with water. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS :

Prevent material from entering sewers or waterways.

### 7. HANDLING AND STORAGE

HANDLING :

Do not get in eyes, on skin, on clothing. Do not take internally. Do not breathe vapors/gases/dust. Use with adequate ventilation. Avoid generating aerosols and mists. Keep away from acids and oxidizing agents. Do not use, store, spill or pour near heat, sparks or open flame. Keep the containers closed when not in use. Have emergency equipment (for fires, spills, leaks, etc.) readily available.

STORAGE CONDITIONS :

Store in suitable labeled containers. Store the containers tightly closed. Store away from heat and sources of ignition. Have appropriate fire extinguishers available in and near the storage area. Connections must be grounded to avoid



## SAFETY DATA SHEET

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

**(800) 424-9300 (24 Hours) CHEMTREC**

electrical charges. Store separately from oxidizers. Store separately from acids. Amine and sulphite products should not be stored within close proximity or resulting vapors may form visible airborne particles.

### SUITABLE CONSTRUCTION MATERIAL :

Compatibility with Plastic Materials can vary; we therefore recommend that compatibility is tested prior to use.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### OCCUPATIONAL EXPOSURE LIMITS :

Exposure guidelines have not been established for this product. Available exposure limits for the substance(s) are shown below.

Substance(s)	Category:	ppm	mg/m3	Non-Standard Unit
Cyclohexylamine	ACGIH/TWA	10		
Diethylethanolamine	ACGIH/TWA	2		
	ACGIH/Skin*			
	OSHA Z1/PEL	10	50	
	OSHA Z1/Skin*			
Morpholine	ACGIH/TWA	20		
	ACGIH/Skin*			
	OSHA Z1/PEL	20	70	
	OSHA Z1/Skin*			

\* Can be absorbed through the skin.

### ENGINEERING MEASURES :

General ventilation is recommended. Use local exhaust ventilation if necessary to control airborne mist and vapor.

### RESPIRATORY PROTECTION :

Where concentrations in air may exceed the limits given in this section or when significant mists, vapors, aerosols, or dusts are generated, an approved air purifying respirator equipped with suitable filter cartridges is recommended. Consult the respirator / cartridge manufacturer data to verify the suitability of specific devices. In event of emergency or planned entry into unknown concentrations a positive pressure, full-facepiece SCBA should be used. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection.

### HAND PROTECTION :

When handling this product, the use of chemical gauntlets is recommended. The choice of work glove depends on work conditions and what chemicals are handled. Please contact the PPE manufacturer for advice on what type of glove material may be suitable. Gloves should be replaced immediately if signs of degradation are observed.

### SKIN PROTECTION :

Wear chemical resistant apron, chemical splash goggles, impervious gloves and boots. A full slicker suit is recommended if gross exposure is possible.



## SAFETY DATA SHEET

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

### EYE PROTECTION :

Wear a face shield with chemical splash goggles.

### HYGIENE RECOMMENDATIONS :

Use good work and personal hygiene practices to avoid exposure. Eye wash station and safety shower are necessary. If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse. Always wash thoroughly after handling chemicals. When handling this product never eat, drink or smoke.

### HUMAN EXPOSURE CHARACTERIZATION :

Based on our recommended product application and personal protective equipment, the potential human exposure is: Low

## 9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	Liquid
APPEARANCE	Light yellow
ODOR	Amine
SPECIFIC GRAVITY	0.98 - 0.99 @ 77 °F / 25 °C
DENSITY	8.1 - 8.2 lb/gal
SOLUBILITY IN WATER	Complete
pH (100 %)	12.0 - 13.0
VISCOSITY	5 cps @ 77 °F / 25 °C
FREEZING POINT	27 °F / -3 °C
VAPOR PRESSURE	6 mm Hg @ 68 °F / 20 °C

Note: These physical properties are typical values for this product and are subject to change.

## 10. STABILITY AND REACTIVITY

### STABILITY :

Stable under normal conditions.

### HAZARDOUS POLYMERIZATION :

Hazardous polymerization will not occur.

### CONDITIONS TO AVOID :

Heat and sources of ignition including static discharges.

### MATERIALS TO AVOID :

Contact with strong acids (e.g. sulfuric, phosphoric, nitric, hydrochloric, chromic, sulfonic) may generate heat, splattering or boiling and toxic vapors. Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid, perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors. Avoid contact with SO<sub>2</sub> or acidic bisulfite products, which may react to form visible airborne amine salt particles. Certain



## SAFETY DATA SHEET

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

amines in contact with nitrous acid, organic or inorganic nitrites or atmospheres with high nitrous oxide concentrations may produce N-nitrosamines, many of which are cancer-causing agents to laboratory animals.

### HAZARDOUS DECOMPOSITION PRODUCTS :

Under fire conditions: Oxides of carbon, Oxides of nitrogen

## 11. TOXICOLOGICAL INFORMATION

The following results are for a similar product.

### ACUTE ORAL TOXICITY :

Species: Rat  
LD50: 779 mg/kg  
Test Descriptor: Similar Product

### ACUTE DERMAL TOXICITY :

Species: Rabbit  
LD50: 2,055 mg/kg  
Test Descriptor: Similar Product

### ACUTE INHALATION TOXICITY :

Species: Rat  
LC50: > 12000 PPM (8 hrs)  
Test Descriptor: Similar Product

### SENSITIZATION :

This product is not expected to be a sensitizer.

### CARCINOGENICITY :

None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

### REPRODUCTIVE EFFECTS :

Prolonged exposure to cyclohexylamine in the diet has produced reproductive effects in rats. The relevance to humans is unknown.

### HUMAN HAZARD CHARACTERIZATION :

Based on our hazard characterization, the potential human hazard is: High

## 12. ECOLOGICAL INFORMATION

### ECOTOXICOLOGICAL EFFECTS :

The following results are for the product.

**SAFETY DATA SHEET**

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

## ACUTE FISH RESULTS :

Species	Exposure	LC50	Test Descriptor
Inland Silverside	96 hrs	500.0 mg/l	Product
Fish		650 mg/l	Product
Sheepshead Minnow	96 hrs	454 mg/l	Product
Fathead Minnow	96 hrs	75 mg/l	Product
Rainbow Trout	96 hrs	130 mg/l	Product

## ACUTE INVERTEBRATE RESULTS :

Species	Exposure	LC50	EC50	Test Descriptor
Mysid Shrimp (Mysidopsis bahia)	96 hrs	131 mg/l		Product
Daphnia magna	48 hrs	190 mg/l		Product

## AQUATIC PLANT RESULTS :

Species	Exposure	EC50/LC50	Test Descriptor
Algae		5,000 mg/l	Product

## AQUATIC MICROORGANISM RESULTS :

Species	Exposure	EC50/LC50	Test Descriptor
Pseudomonas putida		7,500 mg/l	Product

## PERSISTENCY AND DEGRADATION :

Chemical Oxygen Demand (COD) : 563,000 mg/l

The organic portion of this preparation is expected to be readily biodegradable.

## MOBILITY :

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.

If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air	Water	Soil/Sediment
<5%	30 - 50%	50 - 70%

The portion in water is expected to be soluble or dispersible.

## BIOACCUMULATION POTENTIAL

This preparation or material is not expected to bioaccumulate.



## SAFETY DATA SHEET

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

### ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION

Based on our hazard characterization, the potential environmental hazard is: Moderate

Based on our recommended product application and the product's characteristics, the potential environmental exposure is: High

If released into the environment, see CERCLA/SUPERFUND in Section 15.

## 13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it could meet the criteria of a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Before disposal, it should be determined if the waste meets the criteria of a hazardous waste.

Hazardous Waste: D001, D002

Hazardous wastes must be transported by a licensed hazardous waste transporter and disposed of or treated in a properly licensed hazardous waste treatment, storage, disposal or recycling facility. Consult local, state, and federal regulations for specific requirements.

## 14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are as follows.

### LAND TRANSPORT :

Proper Shipping Name :	CORROSIVE LIQUID, FLAMMABLE, N.O.S.
Technical Name(s) :	CYCLOHEXYLAMINE, DIETHYLAMINOETHANOL, MORPHOLINE
UN/ID No :	UN 2920
Hazard Class - Primary :	8
Hazard Class - Secondary :	3
Packing Group :	II
Flash Point :	55 °C / 131 °F

### AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name :	CORROSIVE LIQUID, FLAMMABLE, N.O.S.
Technical Name(s) :	CYCLOHEXYLAMINE, DIETHYLAMINOETHANOL, MORPHOLINE
UN/ID No :	UN 2920
Hazard Class - Primary :	8
Hazard Class - Secondary :	3
Packing Group :	II

### MARINE TRANSPORT (IMDG/IMO) :



# SAFETY DATA SHEET

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

**(800) 424-9300 (24 Hours) CHEMTREC**

Proper Shipping Name :	CORROSIVE LIQUID, FLAMMABLE, N.O.S.
Technical Name(s) :	CYCLOHEXYLAMINE, MORPHOLINE
UN/ID No :	UN 2920
Hazard Class - Primary :	8
Hazard Class - Secondary :	3
Packing Group :	II

## 15. REGULATORY INFORMATION

This section contains additional information that may have relevance to regulatory compliance. The information in this section is for reference only. It is not exhaustive, and should not be relied upon to take the place of an individualized compliance or hazard assessment. Nalco accepts no liability for the use of this information.

### NATIONAL REGULATIONS, USA :

#### OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :

Based on our hazard evaluation, the following substance(s) in this product is/are hazardous and the reason(s) is/are shown below.

Cyclohexylamine : Corrosive, Flammable, Prolonged exposure to cyclohexylamine in the diet has produced reproductive effects in rats. The relevance to humans is unknown.

Diethylethanolamine : Combustible., Corrosive

Morpholine : Corrosive, Flammable, HARMFUL

#### CERCLA/SUPERFUND, 40 CFR 302 :

Notification of spills of this product is not required. Notification of spills of this product is not required.

#### SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :

#### SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :

This product contains the following substance(s) which is listed in Appendix A and B as an Extremely Hazardous Substance. Listed below are the statutory Threshold Planning Quantity (TPQ) for the substance(s) and the Reportable Quantity (RQ) of the product. If a reportable quantity of product is released, it requires notification to your State Emergency Response Commission. You may also be required to notify the National Response Center - See CERCLA/SUPERFUND, above.

<u>Extremely Hazardous Substance</u>	<u>TPQ</u>	<u>RQ</u>
Cyclohexylamine	10,000 lbs	40,000 lbs

#### SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :

Our hazard evaluation has found this product to be hazardous. The product should be reported under the following indicated EPA hazard categories:

- |   |                                   |
|---|-----------------------------------|
| X | Immediate (Acute) Health Hazard   |
| X | Delayed (Chronic) Health Hazard   |
| X | Fire Hazard                       |
| - | Sudden Release of Pressure Hazard |
| - | Reactive Hazard                   |



## SAFETY DATA SHEET

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

### SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :

This product does not contain substances on the List of Toxic Chemicals.

### TOXIC SUBSTANCES CONTROL ACT (TSCA) :

The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

### FOOD AND DRUG ADMINISTRATION (FDA) Federal Food, Drug and Cosmetic Act :

When use situations necessitate compliance with FDA regulations, this product is acceptable under : 21 CFR 173.310 Boiler Water Additives

The following limitations apply:

#### Maximum dosage

45 PPM

#### Limitation

as product in the steam

This product can not be used where the steam produced will contact milk or milk products.

### NSF NON-FOOD COMPOUNDS REGISTRATION PROGRAM (former USDA List of Proprietary Substances & Non-Food Compounds) :

NSF Registration number for this product is : 062362

This product is acceptable for use in meat, poultry, and other food processing areas as a Boiler Treatment Product (G6), for treating boiler and steam lines where the steam produced may contact edible products. Acceptable usage shall be in accordance with the dosage limitations specified on the product label.

This product has been certified as KOSHER/PAREVE for year-round use INCLUDING THE PASSOVER SEASON by the CHICAGO RABBINICAL COUNCIL.

### FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR 116.4 / formerly Sec. 311 :

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

### CLEAN AIR ACT, Sec. 112 (Hazardous Air Pollutants, as amended by 40 CFR 63), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

### CALIFORNIA PROPOSITION 65 :

Substances listed under California Proposition 65 are not intentionally added or expected to be present in this product.



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PRODUCT

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### MICHIGAN CRITICAL MATERIALS :

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

### STATE RIGHT TO KNOW LAWS :

The following substances are disclosed for compliance with State Right to Know Laws:

Cyclohexylamine	108-91-8
Morpholine	110-91-8
Diethylethanolamine	100-37-8

### INTERNATIONAL CHEMICAL CONTROL LAWS :

#### CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :

The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

#### AUSTRALIA

All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

#### CHINA

All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on the Inventory of Existing Chemical Substances China (IECSC).

#### EUROPE

The substances in this preparation have been reviewed for compliance with the EINECS or ELINCS inventories.

#### JAPAN

All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

#### KOREA

All substances in this product comply with the Toxic Chemical Control Law (TCCL) and are listed on the Existing Chemicals List (ECL)

#### PHILIPPINES

All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

## 16. OTHER INFORMATION

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's general risk. This information should provide assistance for your own risk management practices. We have evaluated our product's risk as follows:



## SAFETY DATA SHEET

PRODUCT

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EMERGENCY TELEPHONE NUMBER(S)

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\* The human risk is: Low

\* The environmental risk is: Moderate

Any use inconsistent with our recommendations may affect the risk characterization. Our sales representative will assist you to determine if your product application is consistent with our recommendations. Together we can implement an appropriate risk management process.

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

### REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH, (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight™ (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.



**SAFETY DATA SHEET**

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

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Prepared By : Product Safety Department  
Date issued : 03/10/2011  
Version Number : 2.1

**APPENDIX D**  
**CONTRACTOR 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. WE21**

**FINAL  
CONTRACTOR QUALITY CONTROL PLAN  
AST REMOVALS**

**MARINE CORPS INSTALLATIONS EAST – MARINE CORPS BASE CAMP LEJEUNE  
JACKSONVILLE, NORTH CAROLINA**

**October 2014**

*Prepared for*



Department of the Navy  
Naval Facilities Engineering Command, Mid-Atlantic  
9742 Maryland Avenue  
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*Prepared by*

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<u>Revision</u>	<u>Date</u>	<u>Prepared by</u>	<u>Approved by</u>	<u>Pages Affected</u>
0	10/6/14	C. Joblon	G. Joyce	All

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## TABLE OF CONTENTS

<b>1.0 INTRODUCTION.....</b>	<b>1</b>
1.1 Background .....	1
1.2 Purpose.....	1
<b>2.0 PROJECT ORGANIZATION, RESPONSIBILITY, AND POINTS OF CONTACT.....</b>	<b>1</b>
2.1 Remedial Project Manager (RPM).....	2
2.2 Officer In Charge Of Construction (OICC) .....	2
2.3 Project Manager (PM).....	2
2.4 Safety and Health Manager (SHM).....	3
2.5 Quality Control Program Manager (QCPM).....	4
2.6 Site Superintendent (SS) .....	4
2.7 Project Quality Control Manager (PQCM) .....	5
2.8 Site Safety and Health Officer (SSHO) .....	5
2.9 Subcontractors and Vendors .....	6
2.10 Points of Contact .....	7
<b>3.0 DEFINABLE FEATURES OF WORK .....</b>	<b>7</b>
<b>4.0 SUBMITTALS .....</b>	<b>8</b>
4.1 Review of Submittals .....	8
4.2 Submittal Process .....	9
4.3 Review and Processing of Submittals that Do Not Require Navy Approval.....	9
4.4 Review and Processing of Submittals that Require Navy Approval.....	9
4.5 Revised Submittals.....	10
<b>5.0 TESTING.....</b>	<b>10</b>
<b>6.0 QUALITY CONTROL MEETINGS .....</b>	<b>10</b>
6.1 Coordination and Mutual Understanding Meeting .....	10
6.2 QC Meetings .....	10
<b>7.0 INSPECTIONS .....</b>	<b>11</b>
7.1 Preparatory Phase Inspection .....	11
7.2 Initial Phase Inspection .....	12
7.3 Follow-Up Phase Inspection .....	12
7.4 Receipt Inspections .....	13
7.5 Additional Inspections .....	13
7.6 Completion Inspection .....	13
7.6.1 Construction Quality Control Completion Inspections.....	13
7.6.2 Pre-final Inspection .....	13
7.6.3 Final Acceptance Inspection .....	14
7.7 Inspection Documentation .....	14

<b>8.0</b>	<b>DOCUMENTATION.....</b>	<b>14</b>
8.1	Daily Contractor Quality Control Report.....	14
8.2	Contractor Production Report .....	15
8.3	Logbooks.....	16
8.4	Photographs and Photo Logs.....	16
8.5	Conference Notes and Confirmation Notes .....	16
<b>9.0</b>	<b>CHANGE MANAGEMENT.....</b>	<b>16</b>
9.1	Design Change Notices (DCN).....	17
9.1.1	Identification .....	17
9.1.2	Preparation .....	17
9.1.3	Review and Approval.....	17
9.1.4	Implementation of Approved DCNs .....	17
9.1.5	Records.....	17
9.2	Field Change Request .....	18
<b>10.0</b>	<b>NONCONFORMANCE .....</b>	<b>18</b>
10.1	Root Cause Analysis .....	19
10.2	Corrective Action.....	19
10.3	Condition Requiring Stop Work .....	20
<b>11.0</b>	<b>QUALITY MANAGEMENT.....</b>	<b>20</b>
<b>12.0</b>	<b>REFERENCES.....</b>	<b>20</b>

### LIST OF TABLES

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

### LIST OF FIGURES

Figure 2-1	Organizational Chart
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### LIST OF ATTACHMENTS

Appendix A	Delegation of Authority Letter
Appendix B	Resumes
Appendix C	Contractor Quality Control Forms

## ACRONYMS AND ABBREVIATIONS

AHA	Activity Hazard Analysis
APP	Accident Prevention Plan
AST	Above Ground Storage Tank
CAMLEJ	Camp Lejeune
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CM	Construction Manager
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
ET	Engineering Technician
FCR	Field Change Request
MCAS	Marine Corps Air Station
MCB	Marine Corps Base
MCCS	Marine Corps Community Services
MCI EAST	Marine Corps Installations East
MSDS	Material Safety Data Sheet
NAVFAC	Naval Facilities Engineering Command
Navy	Department of the Navy
NCDENR	North Carolina Department of Environmental and Natural Resources
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NCR	Non-Conformance Report
OICC	Officer in Charge of Construction
PM	Project Manager
PQCM	Project Quality Control Manager
QC	Quality Control
QCPM	Quality Control Program Manager
RAC	Remedial Action Contract
RPM	Remedial Project Manager
SHM	Safety and Health Manager
SPCC	Spill Prevention, Control, and Countermeasure
SS	Site Superintendent
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
UST	Underground Storage Tank

## **1.0 INTRODUCTION**

This Contractor Quality Control (CQC) Plan establishes the procedures and methods to be implemented for the specific activities pertaining to the above ground storage tank (AST) removals at Marine Corps Installations East (MCIEAST) – Marine Corps Base (MCB) Camp Lejeune (CAMLEJ) and Marine Corps Air Station (MCAS) New River complex, Jacksonville, North Carolina. Tetra Tech EC, Inc. (TtEC) has been contracted by the Department of the Navy (Navy) to perform this work at MCIEAST-MCBCAMLEJ under Remedial Action Contract (RAC) N62470-13-D-8007, Contract Task Order (CTO) WE21. This CQC Plan fulfills the requirements of the TtEC quality control (QC) system requirements.

### **1.1 Background**

Numerous fuel storage tanks are in operation aboard the MCB and MCAS complex. The tanks are subject to various State and Federal environmental regulatory requirements and may also require certain specific permits. Recently a steam plant operated by MCB (Building AS-4151), including four ASTs, was taken out of service. There is no plan to reuse the ASTs associated with the steam plant. Various other ASTs at the installation have reached their service life and are no longer needed. These tanks, as well as their associated piping systems, shall be removed per all applicable federal and state regulatory requirements. As part of this project TtEC will remove seven ASTs. These actions will be performed in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), the NCDENR non-UST regulations, and the Federal Spill Prevention, Control, and Countermeasure (SPCC) requirements found in the Code of Federal Regulations (CRF), title 40, section 112.

### **1.2 Purpose**

The purpose of this Project 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 Project CQC 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 that 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 Officer In Charge Of Construction (OICC)**

The Officer in Charge of Construction (OICC) is the Navy representative with the primary responsibility for providing on-site QA and safety oversight of contractors. The OICC 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, prefinal, 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 Safety and Health Manager (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]).
- 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 PQCM 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 Site Superintendent (SS)**

The Site Superintendent (SS) is a TtEC representative who reports to the PM and is responsible for coordinating, directing, implementing, and supervising site construction activities. The SS or designated representative will be on-site at all times during field activities. The SS 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 (if required) 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 SS 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 SS 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 SS.
- Coordinate site safety and emergency response duties and verify site communications system with site personnel.
- Report incidents to the OICC as required by EM 385-1-1 (USACE, 2008).
- Report immediately to the PM, RPM, and OICC 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 SS 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 COR, Zane Parry	(757) 322-4777
Remedial Project Manager/Navy Technical Representative, Bryan Revell	(757) 322-4636
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)
TtEC Site Superintendent, Gary Phelps	(757) 328 7643 (cellular phone)
TtEC Site Safety and Health Officer, Gary Phelps	(757) 328 7643 (cellular phone)
TtEC Project Quality Control Manager, Gary Phelps	(757) 328 7643 (cellular phone)
Facility Fire Department	911
Facility Environmental Management Division, Jenni Reed	(910) 451-9017
Officer in Charge of Construction-ET, Jeff Enos	(910) 451-4318
Officer in Charge of Construction-CM, Jason Manning	(910) 451-2581 x 5264
National Response Center	1-800-424-8802
NCDENR Regional Office (Wilmington)	(910) 796-7215 (business hours) (800) 858-0368 (outside business hours)

### Abbreviations and Acronyms:

COR – Contracting Officer’s Representative  
 CM – Construction Manager  
 ET – Engineering Tech

NCDENR – North Carolina Department of Environment and Natural Resources  
 TBD – To Be Determined

## 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 Site Setup
- Utility Mark-out and Temporary Erosion and Sediment Control Installation
- ASTs and Above Ground Piping Removal
- Removal and Abandonment of Underground Piping
- Building Hazardous Substance Survey, Demolition, and Removal
- Waste Management.
- Site Restoration.
- 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 2006).

#### **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 OICC 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). No testing is required for this project.

### **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, OICC CM, and the OICC ET. 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 OICC. At a minimum, the TtEC personnel required to attend the meeting will include the PM, SS, and PQCM. Minutes of the meeting shall be prepared by the PQCM and signed by the PM and the Navy's RPM and/or OICC 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 OICC. The meetings will be held at the project site and will be attended by the OICC CM, OICC ET, SS, SSHO, and PQCM. The PQCM will notify the OICC 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 OICC 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 SS and other supervising personnel..

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 OICC 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, SS, Navy RPM, or OICC
- 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, OICC, PQCM, SS, 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 OICC 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, SS, OICC, 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 OICC. 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

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 OICC by 10:00 a.m. on the first work day following the date covered by the report, or as agreed to by the OICC. 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 SS 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 OICC 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, SS, 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 SS 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 SS, 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, SS, PQCM, SHM, and QCPM and concurrence from the RPM or OICC

## 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 an 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 Site 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 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 QC Program implementation. The PQCM will perform regular internal QC checks on the site implementation of the 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.

## **TABLES**

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**TABLE 3-1  
DEFINABLE FEATURES OF WORK  
CONTRACT NO. N62470-13-D-8007, TASK ORDER NO. WE21**

<b>ACTIVITY</b>	<b>PREPARATORY</b>	<b>DONE</b>	<b>INITIAL</b>	<b>DONE</b>	<b>FOLLOW-UP</b>	<b>DONE</b>
Mobilization and Site Setup	<ul style="list-style-type: none"> <li>• Verify that RPM, EMD, and OICC 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 setup activities.</li> <li>• Review project plans.</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 each site are photographed.</li> <li>• Verify that North Carolina 811 One Call has been notified and that private utility locator has been scheduled.</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>• Verify electrical connections to AST have been de-energized and disconnected.</li> </ul>	
Utility Mark-out and Temporary Installation of Erosion and Sediment Control Installation	<ul style="list-style-type: none"> <li>• Verify that RPM, EMD, and OICC have been notified.</li> <li>• Ensure areas of excavation are identified.</li> <li>• Ensure a utility North Carolina 811 One Call has been completed.</li> <li>• Verify that the area has been walked/visually inspected for items that could interfere with clearing (utilities, rebar, etc.).</li> <li>• Ensure E&amp;S controls are installed, as described in the WP.</li> <li>• Review AHAs.</li> </ul>		<ul style="list-style-type: none"> <li>• Ensure North Carolina 811 One Call and utility markings are maintained.</li> <li>• Ensure E&amp;S Controls are installed per NCDENR guidelines.</li> <li>• Verify that existing conditions photographs are taken and clearing activity is photographed.</li> </ul>		<ul style="list-style-type: none"> <li>• Ensure North Carolina 811 One Call and utility markings are maintained.</li> <li>• Inspect erosion and sediment (E&amp;S) Controls and ensure they are maintained and in place until soil disturbance activities are completed .</li> <li>• Verify that site activities are being photographed.</li> </ul>	
AST Removals	<ul style="list-style-type: none"> <li>• Verify that RPM, EMD, and OICC have been notified of preparatory meeting.</li> <li>• Review schedule and sequence of work for removal activities.</li> <li>• Ensure that Confined Space Entry requirements are met prior to entry.</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 tank has been emptied of product/sludge, rinsed, and inerted.</li> <li>• Verify that Confined Space Entry requirements are met prior to entry.</li> <li>• Verify that site activities are being photographed.</li> </ul>		<ul style="list-style-type: none"> <li>• Continue initial inspections.</li> <li>• Verify proper rigging/lifting techniques to be used if tank is to be moved.</li> <li>• Verify tank and piping are demolished / broken up to facilitate transportation and disposal.</li> <li>• If any indication of previous fuel/product release is observed notify RPM, EMD, and OICC.</li> <li>• Verify that Confined Space Entry requirements are met prior to entry.</li> <li>• Verify that site activities are being photographed.</li> </ul>	

**TABLE 3-1  
DEFINABLE FEATURES OF WORK  
CONTRACT NO. N62470-13-D-8007, TASK ORDER NO. WE21**

ACTIVITY	PREPARATORY	DONE	INITIAL	DONE	FOLLOW-UP	DONE
Removal of Underground Piping	<ul style="list-style-type: none"> <li>• Verify that RPM, EMD, and OICC have been notified of preparatory meeting.</li> <li>• Ensure a utility North Carolina 811 One Call has been completed.</li> <li>• Review schedule and sequence of work for removal 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 North Carolina 811 One Call and utility markings are maintained.</li> <li>• Ensure a soil containment area is constructed for stockpiling soil.</li> <li>• Verify removed soil is being screened with PID/FID and staged in separate piles.</li> <li>• Verify contaminated soil (if present) piles are on poly-sheeting liner and covered.</li> <li>• Verify that site activities are being photographed.</li> </ul>		<ul style="list-style-type: none"> <li>• Continue initial inspections.</li> <li>• Verify lines have been emptied of product/sludge, rinsed, and inerted.</li> <li>• Verify that a spotter trained in recognizing underground utilities is present at all times.</li> <li>• Verify proper rigging/lifting techniques to be used.</li> <li>• Ensure removed lines are staged on poly-sheeting and inspected for previous releases.</li> <li>• Verify piping is demolished / broken up to facilitate transportation and disposal.</li> <li>• If any indication of previous fuel/product release is observed notify RPM, EMD, and OICC.</li> <li>• Verify that site activities are being photographed.</li> </ul>	
Building Hazardous Substance Survey, Demolition, and Removal	<ul style="list-style-type: none"> <li>• Verify that RPM, EMD, and OICC have been notified of preparatory meeting.</li> <li>• Ensure a utility North Carolina 811 One Call has been completed.</li> <li>• Review schedule and sequence of work for removal activities.</li> <li>• Ensure that utilities to/in building are identified, inspected, and de-energized/disconnected before demolition activities start.</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 North Carolina 811 One Call and utility markings are maintained.</li> <li>• Ensure that all electrical lines/boxes, other utilities, are de-energized or locked-out/tagged-out. (electrical by licensed electrician.</li> <li>• Ensure appropriate personnel perform and document hazardous substance survey.</li> <li>• Ensure that demolition wastes are properly segregated and staged for recycling/disposal.</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 electrical, other utilities are de-energized or locked-out/tagged-out.</li> <li>• Verify that hazardous substance survey is appropriately documented.</li> <li>• Verify proper rigging/lifting techniques to be used.</li> <li>• Verify that demolition wastes are properly segregated and staged for recycling or disposal.</li> <li>• Verify that site activities are being photographed.</li> </ul>	

**TABLE 3-1  
DEFINABLE FEATURES OF WORK  
CONTRACT NO. N62470-13-D-8007, TASK ORDER NO. WE21**

<b>ACTIVITY</b>	<b>PREPARATORY</b>	<b>DONE</b>	<b>INITIAL</b>	<b>DONE</b>	<b>FOLLOW-UP</b>	<b>DONE</b>
Waste Management	<ul style="list-style-type: none"> <li>• Verify that RPM, EMD, and OICC 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.</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 or bills of lading 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>	
Site Restoration	<ul style="list-style-type: none"> <li>• Verify that RPM, EMD, and OICC have been notified of preparatory meeting.</li> <li>• Verify borrow pit to be used is on NCDENR Mining Program approved list.</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 non-contaminated excavated material is used for backfill.</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> </ul>	
Demobilization	<ul style="list-style-type: none"> <li>• Verify that RPM, EMD, and OICC have been notified of preparatory meeting.</li> <li>• Review schedule and sequence of work for demobilization 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>• Verify that final conditions at each 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 sites.</li> <li>• Verify that site activities are being photographed.</li> </ul>	

**Abbreviations and Acronyms:**

AHA – Activity Hazard Analysis  
 APP – Accident Prevention Plan  
 AST – Above Ground Storage Tank  
 EMD – Environmental Management Division  
 E&S – Erosion and Sediment  
 FID – Flame-Ionization Detector  
 NCDENR – North Carolina Department of Environment and Natural Resources

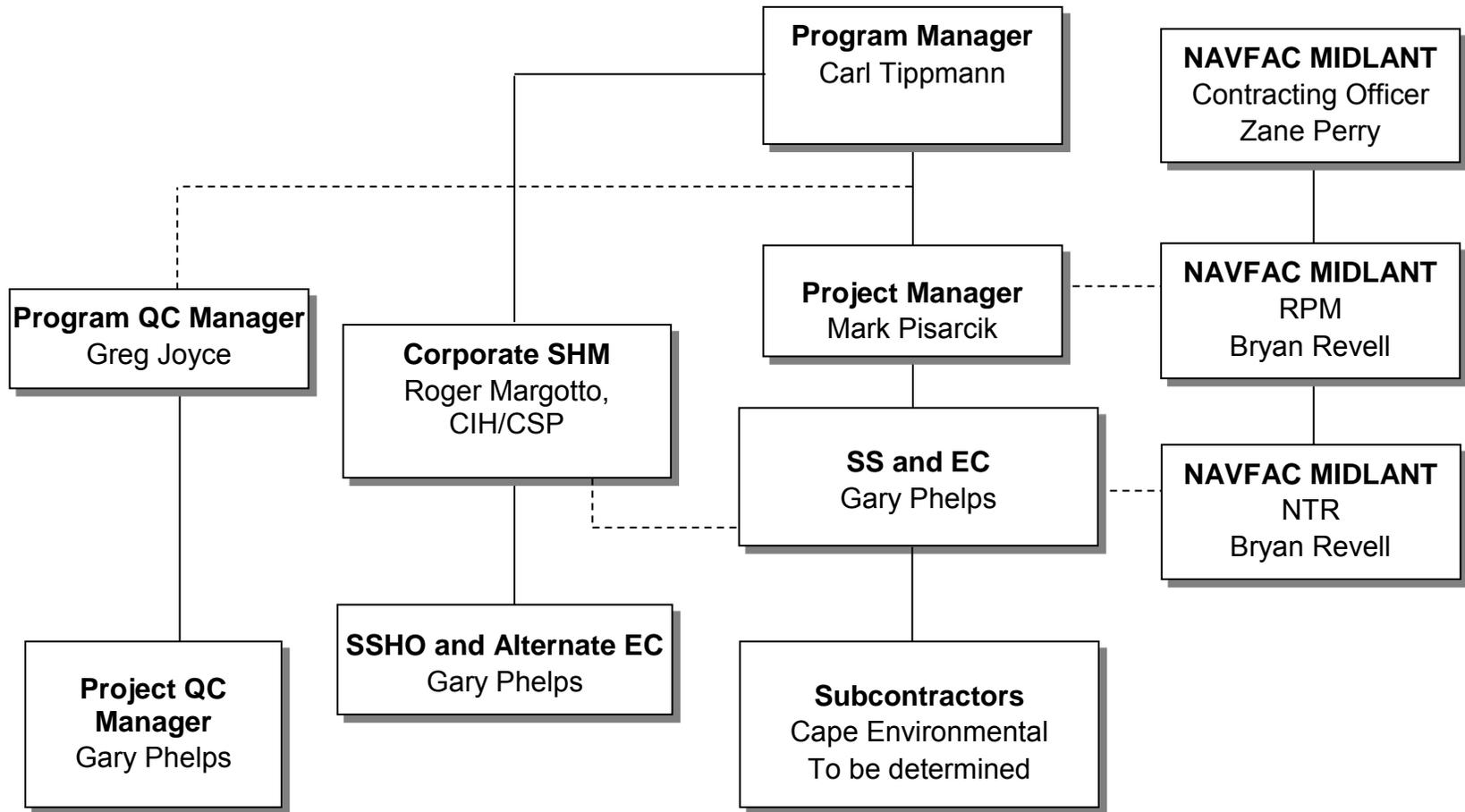
OICC – Officer in Charge of Construction  
 PID – Photo-Ionization Detector  
 RPM – Remedial Project Manager  
 SSHO – Site Safety and Health Officer

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## **FIGURES**

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Figure 2 - 1 Organizational Chart



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**APPENDIX A**  
**DELEGATION OF AUTHORITY LETTER**

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TETRA TECH EC, INC.

August 22, 2014

Mr. Gary Phelps  
Tetra Tech EC, Inc.  
5250 Challedon  
Virginia Beach, Virginia 23462

**Subject: Project Quality Control Manager**

Reference: NAVAL FACILITIES ENGINEERING COMMAND, ATLANTIC  
REMEDIAL ACTION CONTRACT (RAC)  
CONTRACT NO. N62470-13-D-8007, CONTRACT TASK ORDER NO. WE-21

Dear Mr. Phelps:

In accordance with the Lant RAC VI Program Construction Quality Control Management Plan, October 2013, this letter notifies you of your appointment as the Project Quality Control Manager for task order WE-21 at Camp Lejeune, NC, issued under the above contract as directed by the Program QC Manager.

As the designated Project Quality Control Manager, you will be responsible for managing the site-specific quality control requirements in accordance with the approved plan. You will be responsible for conducting quality control meetings, performing the three phases of control, and performing submittal review. You will be required to be present during all field activities to ensure that any testing is conducted in accordance with approved plans. In addition, you will be required to prepare the necessary quality control certification and documentation.

You have the authority and responsibility for suspending work when conditions adverse to quality are identified and for directing the correction of all nonconforming work.

This letter is effective immediately until modified by the Quality Control Program Manager with concurrence of the TtEC Project Manager, the Lant RAC VI Remedial Project Manager, and the Resident Officer in Charge of Construction.

Sincerely,

Tetra Tech EC, Inc.

A handwritten signature in black ink that reads "Gregory D. Joyce".

Gregory D Joyce, ASQ CQM  
Quality Control Program Manager

cc: Mark Pasarcik

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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 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: AST Removals					Location: Jacksonville, NC					
					Contractor Action					Approving Authority Action					Contracting Officer / Contractor
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	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	Mailed to Contractor / Received from Approving Authority	Remarks
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)
	<b>SD-01 Preconstruction Submittals</b>														
	Work Plan	-		G											
	Accident Prevention Plan	-		G											
	Construction Quality Control Plan	-		G											
	Environmental Protection Plan	-		G											
	Traffic Control Plan	-		G											
	Site Plan	-		G											
	Baseline Schedule	-		G											
	<b>SD-11 Closeout Submittals</b>														
	Final Schedule	-		G											
	Daily CPRs														
	Waste Manifests	-													

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: WE21  
 Project AST Removals

Task Order Manager: Mark Pisarcik  
 Location: Jacksonville, NC

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 Site Setup</b>								
WP 3.1.2			Utility Markout	Verify utility locate has been performed for each work area prior to ground disturbance						
WP 3.1.3			Site Plan	Verify the proposed storage/staging areas have been approved and are being used properly.						
WP 3.1.4			Temporary Erosion Controls	Ensure temporary erosion controls are installed as appropriate.						
WP 3.1.5			Traffic Control	Ensure site personnel are familiar with Traffic Control Plan and that it is being followed						
WP 3.4		<b>AST Removals</b>		Ensure electrical connections have been de-energized and disconnected						
				Verify fuel/sludge has been removed from tanks and tanks have been rinsed						
				Verify tanks internal atmosphere has been inerted prior to destruction						
				Ensure tank and piping sized properly for disposal						
				Notify EMD/OICC if evidence of fuel leak is encountered						
WP 3.6		<b>Waste Management</b>		Ensure compliance with MCB CAMLEJ Waste Management Plan						
				Ensure waste manifests are prepared for waste streams and final disposition is documented						
WP 3.7		<b>Site Restoration</b>								
				Only reuse overburden or excavated soil if no visual staining or signs of petroleum contamination was observed						

**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 backfill placed in compacted lifts						
				Ensure all disturbed areas are returned to suitable conditions and seeded/strawed						
				Ensure a pre-final and final inspection are conducted						
WP 3.8		<b>Demobilization</b>		Ensure all equipment, materials, and temporary facilities are removed from the sites						
WP 4.0		<b>Post Construction Reporting</b>		Ensure completion report is prepared and includes waste manifests, daily CPRs, and other pertinent project information						

### TESTING PLAN AND LOG

CONTRACT NUMBER		PROJECT TITLE AND LOCATION						CONTRACTOR			
NAVFAC MidLant RAC N62470-13-D-8007		AST Removals, MCB Camp Lejeune, Jacksonville, NC						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 3.2.1 & WP 3.2.2		Monitor AST Internal Atmosphere with LEL/O2									If in excess of 8% oxygen or 10% LEL tank will be inerted.
WP 3.5 & MCIEAST-MCB CAMLEJ WPM		Waste Characterization Sampling									If necessary, based on disposal facility requirements. Not anticipated to be required.

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**APPENDIX E**  
**PROJECT SCHEDULE**

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Activity ID	Activity Name	Original Duration	Activity % Complete	Start	Finish	14	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	2015	Jun	Jul	Aug	Sep	Oct
<b>CTO WE21 AST Removals, MCB Camp Lejeune, NC</b>		263		21-Jul-14 A	31-Jul-15																		
<b>Contract Award</b>		0		21-Jul-14 A	21-Jul-14 A																		
A1000	Contract Award	0	100%	21-Jul-14 A																			
<b>Period of Performance</b>		263		21-Jul-14 A	31-Jul-15																		
A1010	Period of Performance Start	0	100%	21-Jul-14 A																			
A1020	Period of Performance End	0	0%		31-Jul-15																		
<b>Work Element 1 - Project Management</b>		145		22-Jul-14 A	18-Feb-15																		
<b>Work Element 2 - Preconstruction Activities</b>		57		22-Jul-14 A	29-Sep-14																		
A1060	Draft Work Plan	22	100%	22-Jul-14 A	27-Aug-14 A																		
A1070	Navy Review of Draft Work Plan	10	100%	28-Aug-14 A	11-Sep-14 A																		
A1080	Respond to Navy Comments on Draft Work Plan	3	100%	12-Sep-14 A	16-Sep-14 A																		
A1090	Submit Final Work Plan	7	100%	17-Sep-14 A	26-Sep-14 A																		
A1100	Preconstruction Meeting	1	0%	29-Sep-14	29-Sep-14																		
<b>Work Element 3 - Mobilization, Setup and Clearing</b>		2		14-Oct-14	15-Oct-14																		
A1110	Mobilization, Setup and Clearing	2	0%	14-Oct-14	15-Oct-14																		
<b>Work Element 4 - Fieldwork</b>		44		15-Oct-14	17-Dec-14																		
A1120	Fieldwork	44	0%	15-Oct-14	17-Dec-14																		
<b>Work Element 5 - Transportation and Disposal of Waste</b>		29		05-Nov-14	17-Dec-14																		
A1130	Transportation and Disposal of Waste	29	0%	05-Nov-14	17-Dec-14																		
<b>Work Element 6 - Site Restoration</b>		24		12-Nov-14	17-Dec-14																		
A1140	Site Restoration	24	0%	12-Nov-14	17-Dec-14																		
<b>Work Element 7 - Demobilization</b>		1		18-Dec-14	18-Dec-14																		
A1150	Demobilization	1	0%	18-Dec-14	18-Dec-14																		
<b>Work Element 8 - Post Construction Deliverables</b>		40		19-Dec-14	18-Feb-15																		
A1160	Draft After Action Report	20	0%	19-Dec-14	21-Jan-15																		
A1170	Navy Review of Draft After Action Report	10	0%	22-Jan-15	04-Feb-15																		
A1180	Respond to Comments on Draft After Action Report	5	0%	05-Feb-15	11-Feb-15																		
A1190	Submit Final After Action Report	5	0%	12-Feb-15	18-Feb-15																		

Primary Baseline  
  Remaining Work  
  Baseline Milestone  
 Actual Work  
  Critical Remaining Work  
  Milestone



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**APPENDIX F**  
**ENVIRONMENTAL PROTECTION 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. WE21**

**FINAL  
ENVIRONMENTAL PROTECTION PLAN  
AST REMOVALS**

**MARINE CORPS INSTALLATIONS EAST – MARINE CORPS BASE CAMP LEJEUNE  
JACKSONVILLE, NORTH CAROLINA**

**October 2014**

*Prepared for*



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

*Prepared by*

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

<u>Revision</u>	<u>Date</u>	<u>Prepared by</u>	<u>Approved by</u>	<u>Pages Affected</u>
0	10/6/14	C. Joblon	M. Pisarcik	All

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## TABLE OF CONTENTS

<b>1.0 INTRODUCTION</b> .....	<b>1</b>
1.1 Site Information .....	1
<b>2.0 DESCRIPTION OF WORK</b> .....	<b>1</b>
2.1 Environmental Manager Responsibilities .....	2
<b>3.0 ENVIRONMENTAL REQUIREMENTS</b> .....	<b>2</b>
3.1 Waste Management.....	2
3.1.1 Storage of Solid Waste .....	3
3.1.2 Temporary Storage of Hazardous Waste .....	3
3.1.3 Waste Characterization .....	3
3.1.4 Disposal of Solid Waste.....	3
3.1.5 Disposal of Hazardous Waste .....	3
3.1.6 Transportation of Hazardous Material and Waste .....	4
<b>4.0 BEST MANAGEMENT PRACTICES</b> .....	<b>4</b>
4.1 Protection of Land and Water Resources.....	4
4.1.1 Hazardous Material Management and Spill Prevention .....	4
4.1.2 Stormwater Management and Erosion Controls.....	6
4.2 Protection of Fish and Wildlife.....	6
4.3 Protection of Air Resources .....	6
<b>5.0 SPILL REPORTING AND RESPONSE</b> .....	<b>7</b>
<b>6.0 TRAINING</b> .....	<b>9</b>
<b>7.0 WORKSITE INSPECTIONS</b> .....	<b>10</b>
<b>8.0 REGULATORY INSPECTIONS AND AUDITS</b> .....	<b>10</b>
<b>9.0 REFERENCES</b> .....	<b>11</b>

## LIST OF TABLES

Table 5-1 Spill Reporting Contact List

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## ACRONYMS AND ABBREVIATIONS

APP	Accident Prevention Plan
AST	Above Ground Storage Tank
BMP	Best Management Practice
DCN	Design Change Notice
E&SC	Erosion and Sediment Control
EHS	Environmental, Health, and Safety
EMD	Environmental Management Division
EPP	Environmental Protection Plan
FCR	Field Change Request
HMR	Hazardous Material Regulations
LDR	Land Disposal Restriction
MCAS	Marine Corps Air Station
MCBCAMLEJ	Marine Corps Base Camp Lejeune
MCIEAST	Marine Corps Installations East
MSDS	Material Safety Data Sheet
NCAC	North Carolina Administrative Code
NCDENR	North Carolina Department of Environment and Natural Resources
NFPA	National Fire Protection Association
OICC	Officer In Charge of Construction
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
POL	petroleum, oil, and lubricant
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
SWPPP	Stormwater Pollution Prevention Plan
TtEC	Tetra Tech EC, Inc.
UHC	Underlying Hazardous Constituents
UL	Underwriter's Laboratory
USDOT	U.S. Department of Transportation
WMP	Waste Management Plan

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## **1.0 INTRODUCTION**

This Environmental Protection Plan (EPP) identifies the applicable environmental protection measures to be implemented throughout the course of the fieldwork for the above ground storage tank (AST) removals, Marine Corps Installations East (MCIEAST) – Marine Corps Base Camp Lejeune (MCBCAMLEJ) and Marine Corps Air Station (MCAS) New River complex, Jacksonville, North Carolina. This EPP describes the measures to be implemented to protect land resources, water resources, air resources, and fish and wildlife resources. Additional best management practices (BMPs) that Tetra Tech EC, Inc. (TtEC) will implement to maintain solid environmental protection of these resources during the project are also included in this EPP.

Future changes to this plan will be made in accordance with the Contract Quality Control (QC) Program through the issuance of Field Change Requests (FCRs), Design Change Notices (DCNs), or a more formal plan revision for significant regulatory changes.

### **1.1 Site Information**

The AST sites are located at MCIEAST-MCBCAMLEJ and shown in Figure 1 of the Work Plan. The work to be completed includes four separate areas; site RR15, site G650, site AS4151, and site HP1700. Section 1.2 of the WP provides details on the sites and the ASTs.

## **2.0 DESCRIPTION OF WORK**

The scope of work for this project is to remove seven ASTs and associated piping. Underground piping will be properly abandoned at site G650 as described in the WP. The pipe must be abandoned in place because its removal would impact a roadway that is in use. The work scope also includes a hazardous substance survey of and the demolition and removal of a small brick building located at site G650. Specific tasks to be performed include the following. Additional descriptions of each task can be found in the Work Plan text.

- Mobilization and Site Setup
- Utility Mark-out and Temporary Erosion and Sediment Control Installation
- ASTs and Above Ground Piping Removal
- Removal and Abandonment of Underground Piping
- Building Hazardous Substance Survey, Demolition, and Removal
- Waste Management.
- Site Restoration.
- Demobilization.

## **2.1 Environmental Manager Responsibilities**

TtEC has assigned the role of Project Environmental Manager to Gary Phelps and Gary may be reached at (757) 328 7643.

This person has 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 is supported by the offsite Sr. Environmental Compliance Manager, Jennifer Peters, when required. The Environmental Manager is responsible for overseeing the environmental goals for the project and implementing procedures for environmental protection.

The Environmental Manager is responsible for:

- Compliance with applicable federal, state, and local environmental regulations, including maintaining required documentation.
- Implementation of the Waste Management Plan (WMP).
- Implementation of this EPP.
- Environmental training for TtEC and subcontractor personnel in accordance with their position requirements.
- Monitoring and documentation of environmental procedures.

## **3.0 ENVIRONMENTAL REQUIREMENTS**

TtEC will comply with the requirements in this EPP and other plans as referenced in this EPP. This includes, but is not limited to, preservation of the natural resources within the project boundaries and outside the limits of permanent work performed in their existing condition or restoration of areas to an equivalent or improved condition. TtEC will confine construction activities to the work areas indicated in the Site Plan. Before leaving the site, all materials, equipment, and rubbish will be removed and properly dispositioned. Spills, should they occur, will be promptly cleaned up. TtEC will work to the requirements of the approved plans, this EPP, and the WMP. Other specific requirements are included herein.

### **3.1 Waste Management**

Waste management requirements for project tasks are addressed in the Work Plan and in the MCIEAST-MCBCAMLEJ Waste Management Plan, which is included as Appendix G of the Work Plan. In addition, this EPP incorporates applicable Navy instructions and other local requirements that will be followed during project execution and references other plans where appropriate for additional environmental requirements.

### **3.1.1 Storage of Solid Waste**

Solid waste generated on this project could include general construction debris, fiberglass and metal scraps from AST demolition activities, and construction debris. It is not anticipated that potentially contaminated soil will be encountered during field activities.

All waste will be stored onsite in a designated location in a manner that does not create a nuisance or create unsanitary conditions. Materials will be staged in an area lined and covered with poly-sheeting, when necessary. Waste storage activities will be conducted in accordance with the MCIEAST-MCBCAMLEJ Waste Management Plan, which is included in Appendix G of the Work Plan.

### **3.1.2 Temporary Storage of Hazardous Waste**

TtEC anticipates the generation of regulated hazardous wastes during this project from the cleanout of the AST at site HP1700. The potential exists for identifying and subsequently removing hazardous materials, and potentially hazardous wastes during the building survey and demolition. Any hazardous wastes will be managed onsite in accordance with the applicable federal and state requirements for accumulation and temporary storage. Waste storage activities will be conducted in accordance with the MCIEAST-MCBCAMLEJ Waste Management Plan, which is included in Appendix G of the Work Plan.

### **3.1.3 Waste Characterization**

All solid wastes must be properly characterized before they can be properly managed. Characterization will be made using of generator knowledge and/or analytical sample results. Waste characterization activities will be conducted in accordance with the MCIEAST-MCBCAMLEJ Waste Management Plan, which is included in Appendix G of the Work Plan.

### **3.1.4 Disposal of Solid Waste**

Most solid wastes generated during site activities will be disposed of or recycled offsite at a facility approved and permitted to receive the waste. Removed concrete, asphalt, and recyclable construction debris from the building demolition will be broken into manageable sized pieces and transported to an appropriate disposal or recycling facility. Waste disposal activities will be conducted in accordance with the MCIEAST-MCBCAMLEJ Waste Management Plan, which is included in Appendix G of the Work Plan.

### **3.1.5 Disposal of Hazardous Waste**

Any hazardous wastes are generated and land disposed, they must be disposed of following the Resource Conservation and Recovery Act (RCRA), which includes evaluation of the RCRA Land Disposal Regulations (LDR), including the identification of underlying hazardous constituents (UHCs). If hazardous wastes are generated, the LDR form will be prepared and signed prior to shipment to identify whether the waste meets or does not meet the LDR requirements, and the identification of any UHCs. Waste disposal activities will be conducted

in accordance with the MCIEAST-MCBCAMLEJ Waste Management Plan, which is included in Appendix G of the Work Plan.

### **3.1.6 Transportation of Hazardous Material and Waste**

Hazardous materials will be transported off the site, or offered into commerce, they will be properly declared as a hazardous material and transported in accordance with the U.S. Department of Transportation (USDOT) Hazardous Material Regulations (HMR). All RCRA hazardous wastes meet the definition of a USDOT hazardous material and also must be transported in accordance with USDOT HMR requirements and some nonhazardous wastes are considered USDOT hazardous materials.

In order to transport hazardous material, including waste, those who offer hazardous material (including agents acting on behalf of the Generator) must follow all requirements of the USDOT HMR. Hazardous waste generators must prepare and initiate the shipment, including selection of packaging, marking, labeling, placarding, manifesting, and recordkeeping requirements.

Samples sent offsite to a laboratory for analysis to determine its characteristics are typically exempt from USDOT HMR requirements; however, the samples must still meet USDOT HMR requirements if the sample is or is tentatively identified as meeting the definition of a hazardous material.

Persons who offer USDOT hazardous materials into commerce must be trained in accordance with federal training requirements, including general awareness and function-specific training, safety precautions, and hazardous material security requirements.

Waste transportation activities will be conducted in accordance with the MCIEAST-MCBCAMLEJ Waste Management Plan, which is included in Appendix G of the Work Plan.

## **4.0 BEST MANAGEMENT PRACTICES**

### **4.1 Protection of Land and Water Resources**

#### **4.1.1 Hazardous Material Management and Spill Prevention**

Small amounts of hazardous materials will be used in support of project activities. The hazardous materials used during the remedial action will consist primarily of gasoline within Underwriter's Laboratory (UL) listed, Occupational Safety and Health Administration (OSHA) approved fuel containers for operation of gas-powered equipment or off-road diesel delivered in a vendor's tanker truck for operation of heavy equipment. Other hazardous materials may consist of small quantities of petroleum, oil, and lubricants (POLs) such as grease or WD-40 used for supporting routine operation and maintenance of construction equipment or spray paint for marking the ground during utility location and surveying activities.

The use of the following materials are prohibited: products containing asbestos, formaldehyde, polychlorinated biphenyls, chlorinated fluorocarbons, solder or flux containing more than 0.2 percent lead or pipe or pipe fittings containing more than 8 percent lead, and paint containing more than 0.06 percent lead.

The following measures will be implemented for proper hazardous material management onsite.

- TtEC will maintain a hazardous material inventory and a Material Safety Data Sheet (MSDS) will be obtained and maintained onsite for each hazardous material brought onto or used on the site. The inventory will also show the anticipated quantities of each hazardous material to be used on this project.
- TtEC will use environmentally preferable products whenever possible in lieu of ones with more hazardous or toxic chemicals as long as these materials meet specifications for their intended use.
- Only the minimum quantity of hazardous material necessary to support immediate operations will be in use onsite. Gasoline cans will be filled offsite at a gas station and brought to the site to use as required for equipment operation.
- Containers of unused or remaining hazardous material used on this project shall be transported off site at the end of the project to be reused at other projects.
- Small containers of hazardous materials will be stored onsite (when required) in designated storage locations in the laydown area. Hazardous material storage locations will be covered and containers will be within secondary containment. Incompatible materials (if any) will not be stored together. Flammable liquids, if stored onsite, will be kept within a National Fire Protection Association (NFPA)-approved flammable material storage cabinet.
- Hazardous material containers will be kept closed with tight fitting lids when not in use. All hazardous material containers will be marked as to their contents and hazard. Whenever possible, all containers will be in the original container with original manufacturer's label applied.
- Hazardous materials will only be used for their intended purpose.
- Refueling of equipment will be performed over secondary containment (e.g., small kiddie pool or pan). Refueling will be done with equipment turned off and the person refueling must carefully keep watch and be able to immediately stop the flow when the equipment fuel level is sufficient. The operator must have positive control of the nozzle or container at all times and must not be performing other tasks.
- Refueling of heavy equipment onsite will be via a fuel delivery vendor or by TtEC personnel via a truck bed mounted small DOT specification fuel tank.
- Do not overfill equipment, ensure visual means to evaluate fill level and stop the refueling process before the fuel spills and leave room for expansion (head space).
- Project vehicles and construction equipment will be inspected daily by the operator. If there is any equipment leaking or deficiencies that could cause a spill are observed (e.g.,

loose fittings, damaged hose, etc.), the equipment will be taken out of service and repaired.

- A spill kit for POL related spills will be located onsite in active work zones and refueling areas in sufficient quantity to provide for cleanup of a reasonably anticipated spill that could occur during the project onto soil (e.g., hydraulic hose rupture or small spill during refueling of small equipment). Waste from spill cleanup will be managed in accordance with the WMP.
- If a spill should occur, the spill procedures in Section 5 of this EPP will be followed, including notification requirements. All personnel will be briefed on spill prevention and response as per Section 6 of this EPP. Any spill, even a minor one onsite, if not reported and cleaned up promptly, could result in soil contamination and contaminated stormwater runoff.

#### **4.1.2 Stormwater Management and Erosion Controls**

Because the total disturbed area at the UST/AST sites will be less than one acre, a Storm Water Pollution Prevention Plan (SWPPP) and Erosion and Sediment Control (E&SC) Plan are not required. However, TtEC will implement E&SC measures as appropriate to protect the land and water resources. Control measures to be used may include down gradient silt fence, drain inlet protection, dust control, poly-sheeting underneath and covering waste, and hay bales surrounding material stockpiles. Controls will be installed and maintained in accordance with the North Carolina Erosion and Sediment Control Field Manual. Also, field activities will be executed in a manner that will minimize the amount of land disturbance at each site. If it becomes apparent these measures do not adequately prevent erosion and keep sediment on site, additional measures will be implemented.

#### **4.2 Protection of Fish and Wildlife**

While the project has been determined not to have an effect on endangered or threatened species and no fish habitat is present at the site, TtEC will not otherwise feed, harass, or intentionally harm or kill animals, including birds or snakes if present. If an animal becomes a nuisance which could endanger safety of workers, TtEC will notify the Contracting Officer and a representative from a fish and wildlife agency will be contacted to handle the animal.

#### **4.3 Protection of Air Resources**

TtEC will minimize the creation of dust, air pollution, and odors during the project as follows:

- Dust controls on roadways and during soil handling or demolition operations will be maintained to minimize fugitive dusts:
  - by water sprinkling on roadways and haul routes that trucks and vehicles travel on as long as the sprinkling does not contribute to stormwater runoff and erosion.
  - by keeping vehicle and truck speeds down on unpaved or dirt roads to minimize dust generation.

- Air pollution will be controlled through use of construction equipment that has working air pollution devices to control emissions in exhaust and filter systems (as provided by manufacturer). Anti-pollution devices will not be tampered with or removed.
- Odors are not anticipated to be an issue on this project.
- Fuel storage containers and hazardous material containers will be kept closed when not in use to keep volatile organic compound emissions down.
- Equipment will be maintained in good working order, operated for its' intended purpose, and serviced in accordance with manufacturer's recommendations.
- Equipment will not be idled more than necessary.
- Work will be sequenced to avoid unnecessary or premature disturbance to the site.
- Loads of soil brought to the site will be covered or tarped during transit.
- Stockpiles of soil and temporary slopes will be protected to minimize spread of dusts via wind erosion as practicable.
- Also see hazardous material management requirements.

## **5.0 SPILL REPORTING AND RESPONSE**

Primary spill response procedures are included in Section 9.2.2 of the Accident Prevention Plan (APP) which has been prepared as a separate appendix to the WP. This section supplements those procedures.

In the event of a spill on site, the person discovering the spill will notify the Site Superintendent. The Environmental Protection Manager will be notified and the Site Safety and Health Officer will be notified. The Environmental Protection Manager will assist the Site Superintendent with evaluation of the spill for reporting purposes and the Site Safety and Health Officer will evaluate the spill for safety purposes. The Site Superintendent will notify the TtEC Project Manager and the Contracting Officer or delegate these notifications to the Environmental Manager. The Environmental Manager will also notify the TtEC Safety and Health Manager. The Site Superintendent (who is the Emergency Coordinator listed in the APP) will immediately notify the MCIEAST-MCBCAMLEJ Environmental Management Division (EMD), Officer in Charge of Construction (OICC), Fire Department, and Facility Response Personnel in addition to the legally required federal, state, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment.

A spill kit will be available in an accessible location in laydown areas, at refueling points, and near active work areas where equipment is operating. Each kit will contain at least 10 sorbent pads, 2 oil sorbent socks, and 2-pairs of nitrile gloves and a bag for containing used pads and socks. Two bags of additional sorbent pads and 10 additional sorbent socks will be available and accessible in the material storage location in the laydown area as well as additional bags for immediate containment of used sorbent materials and an open head drum or other suitable immediate storage container with lid. Other spill response equipment and materials include brooms and shovels that will be available at the laydown area. The Environmental Manager

will inspect spill materials weekly to ensure kits remain stocked and adequate supply is restocked in kits and laydown area when volumes are depleted.

The cleanup will be jointly overseen by the Site Superintendent, the Site Safety and Health Officer (for safety of personnel), and the Environmental Manager (for environmental protection).

Per Chapter 143 of Article 21A of the North Carolina Administrative Code (NCAC), notice must be provided to the North Carolina Department of Environment and Natural Resources (NCDENR) as follows:

A person who owns or has control over petroleum that is discharged into the environment shall immediately take measures to collect and remove the discharge, report the discharge to the NCDENR Regional Office within 24 hours of the discharge, and begin to restore the area affected by the discharge in accordance with the requirements of this Article:

- If the volume of the petroleum that is discharged is 25 gallons or more or if the petroleum causes a sheen on nearby surface water or if the petroleum is discharged at a distance of 100 feet or less from any surface water body.
- If the volume of petroleum that is discharged is less than 25 gallons, the petroleum does not cause a sheen on nearby surface water, and the petroleum is discharged at a distance of more than 100 feet from all surface water bodies, the person who owns or has control over the petroleum shall immediately take measures to collect and remove the discharge.
- If a discharge of less than 25 gallons of petroleum cannot be cleaned up within 24 hours of the discharge or if the discharge causes a sheen on nearby surface water, the person who owns or has control over the petroleum shall immediately notify the Department.

Spill reporting requirements for this project are as follows:

- All spills, no matter how small or insignificant will be reported as noted above to TtEC, Contracting Officer, and Facility contacts.
- Spills that will be reported to NCDENR Regional Office include:
  - Oil spills that reach surface water
  - Oil spills that do not reach surface water
  - Spills of hazardous substances if spill is a reportable quantity
- Spills that will be reported to the National Response Center include:
  - Oil spills that reach surface water
  - Spills of hazardous substances if spill is a reportable quantity

Table 5-1 includes a list of the personnel to be notified and is duplicated from portions of that in the APP.

**Table 5-1. Spill Reporting Contact List**

Navy COR, Zane Perry	(757) 322-4777
Remedial Project Manager/Navy Technical Representative, Bryan Revell	(757) 322-4636
TtEC Project Manager, Mark Pisarcik	(757) 518-8491 (office phone) (757) 544-2085 (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)
TtEC Site Superintendent, Gary Phelps	757) 328 7643 (cellular phone)
TtEC Site Safety and Health Officer, Gary Phelps	757) 328 7643 (cellular phone)
Facility Fire Department	911
Facility Environmental Management Division, Jenni Reed	(910) 451-9017
Officer in Charge of Construction-ET, Jeff Enos	(910) 451-4318
Officer in Charge of Construction-CM, Jason Manning	(910) 451-2581 x 5264
National Response Center	1-800-424-8802
NCDENR Regional Office (Wilmington)	(910) 796-7215 (business hours) (800) 858-0368 (outside business hours)

## 6.0 TRAINING

All TtEC employees and subcontractors will receive environmental training prior to commencing site activities. Training will be conducted by the Project Environmental Manager. All training will be documented by the Project Environmental Manager and employees will sign and date the training documentation. This training will include review the specific environmental requirements that apply to this project as follows:

- Review of the WMP and its requirements regarding waste management as referenced in this EPP;
- Review of this EPP and its requirements regarding hazardous material management and spill prevention; and
- Review of this EPP and its requirements for spill reporting and response.

In addition, workers assigned to specific tasks such as maintenance or repair of erosion and sediment controls, workers who conduct refueling operations, or who manage wastes onsite will have additional training, performed by the Project Environmental Manager to ensure the worker knows their environmental responsibilities and the procedures that must be followed (e.g., proper installation of silt fence).

Additional levels of training are required for specific tasks, which, if required for this project (currently not anticipated), will be obtained (if training is not documented already) through an outside professional training provider or a qualified TtEC in-house training provider as follows:

- USDOT HMR training. If a person performs a USDOT related task such as selection of packaging, marking, labeling, preparation of a shipping paper, or loading of a USDOT hazardous material, they must be trained (general awareness, function-specific, safety precautions, and security requirements. Training is required initially and then every three years.
- RCRA Hazardous Waste Generator training. Persons who are responsible for offering hazardous waste into transportation for purposes of disposal must be trained under the RCRA Generator training requirements. This includes persons who prepare or sign waste profile sheets, LDRs, and manifests. In addition, USDOT requirements also apply as all hazardous wastes are USDOT hazardous material.

## **7.0 WORKSITE INSPECTIONS**

The jobsite will be inspected informally on a daily basis by Environmental Manager to evaluate the following:

- Good housekeeping practices, including proper storage of material equipment in laydown areas and active work areas;
- Proper implementation of BMPs related to spill prevention and hazardous material use and handling.

These informal inspections, if they result in a finding, will be immediately corrected or reported to the Site Superintendent for correction. The Environmental Manager may document these informal inspections, findings, and corrective actions in their logbook.

Weekly formal inspections of the project will be performed by the Environmental Manager (may be done jointly with the Site Safety and Health Officer, Site Superintendent, or Project Quality Control (QC) Manager) in accordance with TtEC Corporate Environmental, Health, and Safety (EHS) Procedure 3-3 - Inspections. This procedure includes a form that will be used to document the inspection and a corrective actions form that will be used to inspect the site (a checklist) and a form to document any required corrective actions for deficiencies as noted during the inspection.

Copies of inspections and corrective actions will be maintained onsite by the Environmental Manager.

## **8.0 REGULATORY INSPECTIONS AND AUDITS**

If project personnel are contacted by a regulatory agency for an inspection of the site, the Site Superintendent and Environmental Manager will immediately be notified. The Site Superintendent will contact the Project Manager and Facility EMD representative. The Project

Manager will notify the Navy Remedial Project Manager (RPM). TtEC will follow the direction from the Navy and provide for safe access to the site for inspection at Navy direction.

TtEC Corporate Procedure EHS 1-10 – External Regulatory Inspections will be followed for internal reporting of any regulatory inspection that occurs on TtEC projects.

## **9.0 REFERENCES**

NAVFAC Mid-Atlantic. Scope of Work-Revised. Above Storage Tanks (ASTs), at. Marine Corps Base Camp Lejeune, NC. Prepared for Tetra Tech EC, Inc. May 28, 2014.

Tetra Tech EC, Inc. Basis of Estimate and Proposal-Revised. RRP XE21 – Above Ground Storage Tank Removals at. Marine Corps Base Camp Lejeune, Jacksonville, NC. Prepared for Naval Facilities Engineering Command Mid-Atlantic. June 11, 2014.

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## **APPENDIX G**

### **MCIEAST-MCBCAMLEJ WASTE MANAGEMENT PLAN**

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# **Investigation and Remediation Waste Management Plan**

## **Marine Corps Installations East - Marine Corps Base Camp Lejeune North Carolina**

**Updated September 2013**

Prepared for

**Department of the Navy  
Naval Facilities Engineering Command  
Mid-Atlantic**

Under the

**NAVFAC CLEAN 8012 Program  
Contract N62470-11-D-8012**

Prepared by



**Charlotte, North Carolina**

# Contents

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<b>Acronyms and Abbreviations.....</b>	<b>v</b>
<b>1 Introduction.....</b>	<b>1-1</b>
<b>2 Types of Waste .....</b>	<b>2-1</b>
2.1 Soil .....	2-1
2.2 Water .....	2-1
2.3 Solid Debris .....	2-2
<b>3 Waste Characterization.....</b>	<b>3-1</b>
<b>4 Waste Management .....</b>	<b>4-1</b>
4.1 Waste Storage Time Limit.....	4-1
4.2 Labels .....	4-1
4.3 Containers and Accumulation .....	4-2
4.3.1 Drums and Small Containers .....	4-3
4.3.2 Roll-off Boxes.....	4-3
4.3.3 Portable Tanks .....	4-4
4.3.4 Soil Stockpiles .....	4-4
<b>5 Shipping Documentation.....</b>	<b>5-1</b>
<b>6 Transportation for Off-Site Disposal.....</b>	<b>6-1</b>
<b>7 Disposal .....</b>	<b>7-1</b>
7.1 Onsite Disposal .....	7-1
7.2 Offsite Disposal.....	7-1
<b>8 Recordkeeping.....</b>	<b>8-1</b>

## Attachments

- 1 NCDENR Email – IDW/RDW Management for MCIEAST-MCB CAMLEJ
- 2 Transportation and Disposal Log

## Tables

- 3-1 Typical Analyte List

## Figures

- 2-1 Waste Disposal Flowchart
- 2-2 Site Locations Map
- 4-1 Drum Staging with Secondary Containment

# Acronyms and Abbreviations

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°F	degree Fahrenheit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CTO	Contract Task Order
DOT	Department of Transportation
DRO	diesel range organics
EMD	Environmental Management Division
GRO	gasoline range organics
GS	General Statutes
ID	identification
IDW	investigation-derived waste
IR	Installation Restoration
MCAS	Marine Corps Air Station
MCIEAST-MCB CAMLEJ	Marine Corps Installations East - Marine Corps Base Camp Lejeune
NCAC	North Carolina Administration Code
NC SSL	North Carolina Soil Screening Level
NFA	No Further Action
POL	petroleum, oils, and lubricants
PPE	personal protective equipment
RCRA	Resource Conservation and Recovery Act
RCRS	Resource Conservation and Recovery Section
RDW	remediation-derived waste
SVOC	semivolatile organic compound
TCLP	Toxicity Characteristic Leaching Procedure
TO	Task Order
TPH	total petroleum hydrocarbons
USEPA	United States Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound
WMP	Waste Management Plan
WWTP	wastewater treatment plant

## SECTION 1

# Introduction

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The scope of this Waste Management Plan (WMP) addresses the management and disposal requirements for wastes generated during investigation and remediation activities at Marine Corps Installations East - Marine Corps Base Camp Lejeune (MCIEAST-MCB CAMLEJ) (the Base). It is anticipated that the following wastes will be generated during these activities:

- Non-hazardous and hazardous soil from investigation and remedial activities
- Non-hazardous and hazardous water from investigation and remedial activities
- Solid debris, including disposable sampling equipment and personal protective equipment (PPE)

This investigation-derived waste (IDW) and remediation-derived waste (RDW) will require management and disposal in a manner that is consistent with state and federal law and minimizes potential hazards to the public. IDW is defined as waste that is generated while performing an investigation action. Investigations include all phases of work that take place before finalizing the remedial design, excluding any removal actions. Pilot studies are considered investigations. RDW is defined as waste that is generated during any remedial, removal, or corrective action. The Environmental Management Division (EMD) has the primary responsibility for wastes generated at the Base. This plan describes methodologies and procedures that responsible contractors will implement to handle, manage, and dispose of waste at the Base. Procedures for managing, handling, and disposing of project-specific waste will be addressed in the project-specific plan. This plan is prepared for the overall management of waste generated during environmental investigation and remediation work at MCIEAST-MCB CAMLEJ under the following remediation frameworks:

- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- Resource Conservation and Recovery Act (RCRA)
- Underground Storage Tank (UST) Program
- Non-UST with petroleum, oils, or lubricants (POL)

Wastes generated while performing activities in each framework may have different requirements that are addressed in the following sections. In order to use this document you must know which framework the work will be operating under so that the proper requirements are met. It should be noted that CERCLA actions are subject to the Applicable or Relevant and Appropriate Requirements that are established for them and these requirements may differ from the requirements of this plan. This WMP does not address hazardous wastes generated as part of operational processes. Refer to the Installation's Hazardous Waste Management Plan maintained by EMD/Resource Conservation and Recovery Section (RCRS).

# Types of Waste

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## 2.1 Soil

Soil may be generated from either investigation or remediation activities and may consist of soil cuttings generated during drilling activities, soils that accumulate in the decontamination pad from washing equipment, and soils generated during remedial activities. Soil that is IDW and is not from a known source area or area of suspected soil contamination may be returned to the borehole or spread on the ground surface near the boring from which it was removed. All cuttings will be screened with an organic vapor analyzer and flame ionization detector before spreading. If a large volume of soil will be generated that will require grading, seeding, and/or erosion control measures, other disposal options should be considered. If it cannot be presumed that the soil can be spread around the borehole during fieldwork, the soil should be properly accumulated in containers, as described in **Section 4**. If subsequent analytical results show that the soil is not contaminated and the soils from multiple boreholes have not been aggregated or have only been aggregated with other boreholes in close proximity (such as a well cluster), the soil may be returned to the site and spread around the original borehole.

IDW soil that cannot be spread around the borehole and RDW soil will be used as soil cover at the Base landfill if it is non-hazardous and contains no petroleum, oils, or lubricants (POL). If the soil cannot be used at the Base landfill, offsite disposal will be arranged at an appropriate facility, as described in **Section 7.2**. Soil will be accumulated in drums, bulk containers, or stockpiles in accordance with the procedures discussed in **Section 4**. If waste containers cannot be stored in a fenced, secured area or if hazardous waste is generated, the waste must be transported to a less-than-90-day storage facility on the Base. This location will be identified in a project-specific plan (such as a Work Plan or Sampling and Analysis Plan). All containers used to accumulate waste will be kept closed and secured when waste is not being added or removed. Roll-offs will be lined and covered while awaiting transportation and disposal.

Soil should be assumed to be non-hazardous unless there is evidence otherwise. Hazardous waste is defined as waste that is listed in Title 40 Code of Federal Regulations (CFR) 261, Subpart D, or that is characteristically hazardous as defined by 40 CFR 261, Subpart C. No site currently identified at MCIEAST-MCB CAMLEJ contains waste listed in 40 CFR 261, Subpart D. Any newly identified site would need to be assessed. Characteristically hazardous waste exhibits at least one of the following characteristics:

- **Ignitability** - Flashpoint that is less than 140 degrees Fahrenheit (°F)
- **Corrosivity** - pH of 2 or lower or a pH of 12.5 or higher
- **Reactivity** – The waste is normally unstable and undergoes violent change without detonating, is explosive, or reacts violently or produces toxic gas when exposed to water, air, or heat.
- **Toxicity** – The waste contains constituents that exceed the toxicity limits listed in 40 CFR 261.24.

Soil to be disposed of will be characterized, and a formal waste characterization will be made using analytical results and generator knowledge, as described in **Section 3**. All wastes should be disposed of within 90 days of the accumulation start date. All containers should be labeled in accordance with the instructions in **Section 4.2**. The soil disposal process is shown on **Figure 2-1**.

## 2.2 Water

Wastewater will be produced during monitoring well development, groundwater purging and sampling, and possibly during remedial operations. Wastewaters that are from the same site may be aggregated as long as they are the same type of waste. Different types of hazardous wastewater will never be aggregated.

The wastewater treatment plant (WWTP) at Lot 203 can be used to dispose of wastewater that is generated during CERCLA work at the approved Installation Restoration (IR) Sites 3, 6, 78, 82, 88, and 96. **Figure 2-2** shows the locations of these sites. Prior notification and approval from the WWTP operator is required for disposal, and any paperwork requested by the operator must be completed. At a minimum, the IDW Management Form supplied by the operator must be completed at least 3 days before any planned IDW water disposal at Lot 203. All wastewater that can be disposed of in this manner will be discharged before demobilization from the site. Based on the design limitations of the plant, the following practices will be adhered to when disposing of wastewater at the WWTP:

- Water containing sediment will be allowed to settle for at least 8 hours and filtered before dumping to the wet well
- No free product will be disposed of at the WWTP
- Working with the WWTP operator, the responsible contractor's personnel will supervise all subcontractors that dispose of wastewater at the WWTP

The use of an oil water separator (OWS) may be required by some POL sites in situations that require the holding of petroleum contaminants until they can be recovered and properly disposed. In the event the use of an OWS will be used, RCRS (910-451-5306) or the Pollution Abatement Section (910-451-5264) will be contacted for further instruction.

Wastewater that cannot be disposed of at the WWTP or the OWS will be accumulated in containers, as described in **Section 4**, and containers will be staged at a fenced and secured location or at a less-than-90-day storage area. All containers used to accumulate wastewater will be kept closed and secured when waste is not being added or removed. Wastewater should be assumed to be non-hazardous unless otherwise indicated. Hazardous wastewater is defined as wastewater that is listed in 40 CFR 261, Subpart D, or that is characteristically hazardous as defined by 40 CFR 261, Subpart C. No site currently identified at MCIEAST-MCB CAMLEJ contains the type of wastewater listed in 40 CFR, Subpart D. Any newly identified site would need to be assessed. Characteristically hazardous wastewater exhibits at least one of the following characteristics:

- **Ignitability** - Flashpoint that is less than 140°F
- **Corrosivity** - pH of 2 or lower or a pH of 12.5 or higher
- **Reactivity** – The wastewater is normally unstable and undergoes violent change without detonating, is explosive, or reacts violently or produces toxic gas when exposed to water, air, or heat
- **Toxicity** – The wastewater contains constituents in concentrations that exceed the toxicity limits listed in 40 CFR 261.24

Wastewater will be analyzed before offsite disposal, and a formal waste characterization will be made using the results, as described in **Section 2**. All wastewater disposed of offsite should be disposed of within 90 days of the accumulation start date. The procedure for disposing of IR site-related wastewater is shown on **Figure 2-1**. For underground storage tank (UST) site-related wastewater, refer to Figure 5 within Section 6.0 of *Guidelines for Assessment and Corrective Action for UST Releases, UST Section North Carolina Department of Environmental and Natural Resources, Division of Waste Management, July 15, 2008, Version Change 1, Effective December 1, 2008* (the UST Guidance).

## 2.3 Solid Debris

Other debris that may be generated at the site includes plastic sheeting, PPE, and disposable sampling equipment. These items will be characterized according to the waste that they are associated with. Debris associated with non-hazardous waste should be accumulated in black, non-translucent trash bags. The bags should be secured and disposed of in a dumpster on the Base. Debris associated with hazardous waste will be accumulated in drums or bulk containers as hazardous waste. These items will be disposed of offsite in accordance with the procedures described in **Section 7** of this WMP. The steps for disposing of solid debris are shown on **Figure 2-1**.

# Things to Consider

- Determine what types of contaminants are at the site (e.g., petroleum/non-petroleum, metals, cVOCs). Determine where you anticipate disposal and begin coordination with that facility. Always have an alternate plan; disposal facilities can refuse any waste for any reason.
- Is significant contamination expected? If so, engage compliance. May need to manage as hazardous waste until analytical proves otherwise.
- Could generator knowledge be used to classify the waste? (LTM or engage compliance)?
- Is the site a high traffic area or remote? In high traffic areas additional security for containers/ stockpiles is needed.
- What types of containers will be used? Consider the volume and properties of the waste. Determine how containers will be procured and transported to the site.
- Where/how will waste be secured? All waste must be secured (i.e. inside of a fence). Do not demobilize from the site until waste is properly secured. Ensure that the location has adequate capacity. Ensure that bulk containers can be maneuvered into the space. For non-hazardous wastes use the storage bays at Building S-960, or within a locked, fenced in area on site. For hazardous waste use the <90 day storage areas on Mainside.
- How will the waste be moved?

**Non-hazardous:** The preferred method of waste transportation is to use a subcontractor. Contractor personnel can move small quantities of non-hazardous waste only if it can be done SAFELY.

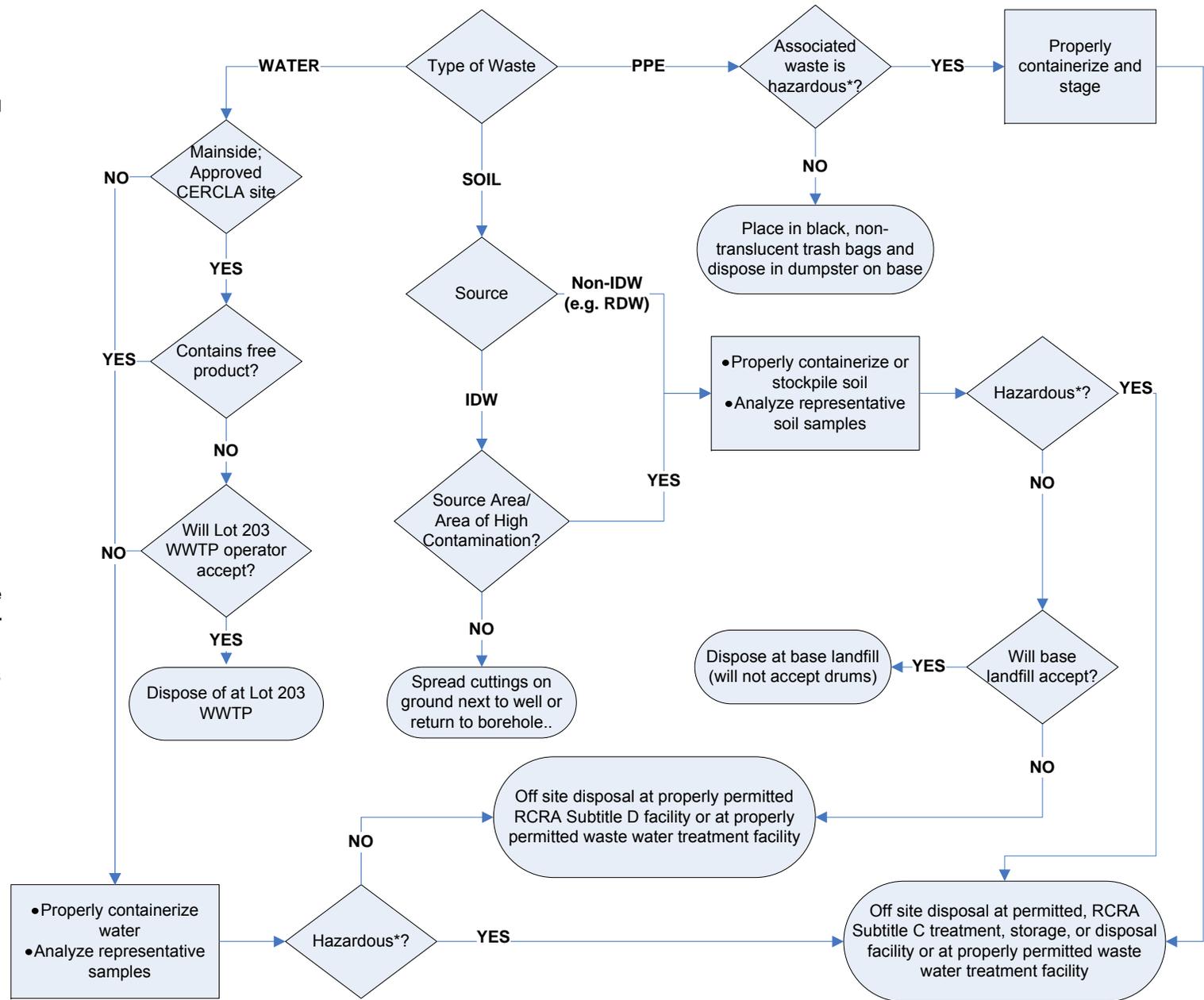
**Hazardous:** Hazardous wastes will only be transported by a certified waste hauler.

RDW – Remediation-Derived Waste  
IDW – Investigation-Derived Waste

WWTP – Wastewater Treatment Plant  
LTM – Long-Term Monitoring

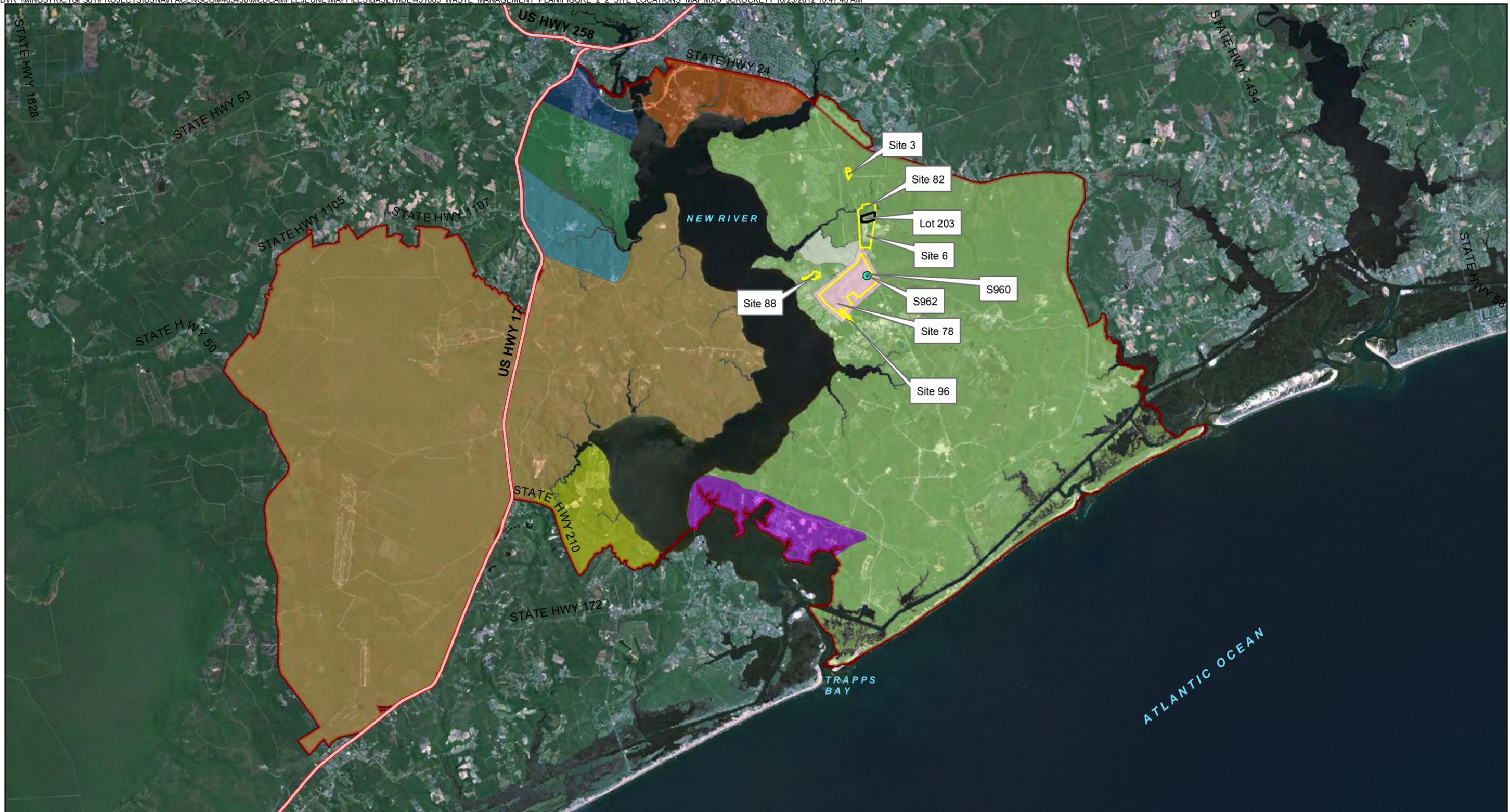
\*As defined by 40 CFR 261

# START



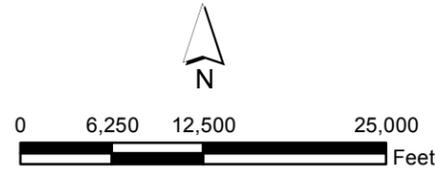
**Figure 2-1**  
Waste Disposal Flow Chart  
Waste Management Plan  
MCIEAST-MCB CAMLEJ, North Carolina

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- Legend**
- Less than 90 Day Storage Area
  - Highways
  - DRMO Area Lot 203
  - IR Sites
  - Installation Area
  - Hadnot Point Industrial Area
  - Wallace Creek Construction Area
  - Air Station
  - Camp Devil Dog
  - Camp Geiger
  - Courthouse Bay
  - Greater Sandy Run/K - Impact Area
  - Main Side
  - Montford Point/Tarawa Terrace
  - Rifle Range/Stone Bay

Notes:  
 IR Sites 3, 6, 78, 82, 88, and 96 are CERCLA sites approved for wastewater disposal at the WWTP at Lot 203.



1 inch = 12,500 feet

Figure 2-2  
 Site Locations Map  
 Waste Management Plan  
 MCIEAST-MCB CAMLEJ  
 North Carolina



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SECTION 3

# Waste Characterization

Historical documentation will be reviewed from each site to determine whether the waste from that site is hazardous as defined by 40 CFR 261, Subpart D. The Base, as the generator, will make the final determination concerning the existence of listed hazardous waste. A combination of analytical testing and generator knowledge may be used to determine if waste is characteristically hazardous as defined by 40 CFR 261, Subpart C. Where analytical testing is used, both site conditions and historical data will be taken into account to establish the sampling frequency and analyte list. At sites that have a single, roughly homogenous plume, and where wastes are collected in bulk containers, one sample per medium per site is required. In other cases where waste is collected in bulk containers, one sample per 500 tons of solid media and one sample per bulk liquid container are required. Where waste is collected in drums, one sample per 10 drums of each medium is required. The typical analyte list for CERCLA, RCRA, UST, and Non-UST POL sites is presented in **Table 3-1**. In the case of UST sites, the abbreviated analyte list in **Table 3-1** is typically appropriate based on the nature of contamination at those sites; but if non-petroleum contaminants are present, the analyte list should be reassessed. When planning to characterize waste with generator knowledge, the Base must approve of this practice and the disposal facility that will be used must also agree to accept the waste with only generator knowledge to support the waste profile. The use of generator knowledge may be appropriate for long-term monitoring sites, UST sites, or sites where remedial actions have been completed. Deviations from the sampling frequency and analyte lists in this WMP will be detailed in the site-specific work plan.

For wastes generated at CERCLA or RCRA sites where the use of generator knowledge is not adequate for characterization, the following analyses should be performed: Toxicity Characteristic Leaching Procedure (TCLP) for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, herbicides, and metals; ignitability; corrosivity; reactive cyanide; and reactive sulfide. In addition, for soil that will be used at the Base landfill, the following analyses must be added: total petroleum hydrocarbons (TPH) for gasoline range organics (GRO) and diesel range organics (DRO) and any analyte related to the contaminant of concern at that site. Waste generated from UST sites typically may be characterized using TPH-GRO, TPH-DRO, and RRCRA metals. In special cases, generator knowledge may be used to characterize waste.

TABLE 3-1  
Typical Analyte List

Analysis Required		CERCLA/RCRA Site Waste	Use at Base Landfill (Soil)	UST/Non-UST POL Site Waste
TCLP	VOCs Method SW846-8260B	X	X	
	SVOCs Method SW846-1311/8270C	X	X	
	Pesticides Method SW846-8081A	X	X	
	Herbicides Method SW846-8151A	X	X	
	Metals Method SW846-6010B	X	X	
Ignitability Method SW846-1010A		X	X	
Corrosivity Method SW846-9040B		X	X	
Reactive Cyanide Method SW846-9012A		X	X	

TABLE 3-1  
Typical Analyte List

Analysis Required	CERCLA/RCRA Site Waste	Use at Base Landfill (Soil)	UST/Non-UST POL Site Waste
Reactive Sulfide Method SW846-9034R	X	X	
TPH-GRO EPA Method 8015C		X	X
TPH-DRO EPA Method 8015C		X	X
RCRA 9 Metals Method SW846-6010B/7000			X

Waste characterization information will be documented on a waste profile form provided by the treatment and/or disposal facility as part of the waste acceptance process. For offsite disposal, the responsible contractor will provide a profile package to the Base that includes a draft profile for review and signature, a data summary table, analytical data package, and documentation of any relevant generator knowledge. A unique profile tracking number will be assigned to the analytical package and the profile. In addition, this profile number will be incorporated into waste container numbers to allow personnel to easily match waste streams with containers. Profile tracking numbers will be assigned using the following format:

*CTO/TO Number -Site#- Media/count number*

An explanation of each of these identifiers is given as follows.

- Contract Task Order (CTO)/  
Task Order (TO) Number**      Number identifying which project generated the waste
- Site Number**      Identifies the location where the waste was generated
- Media**      Describes the waste :  
  - W-water
  - S – soil
  - SL – sludge (or mud)
  - D-debris
- Count number**      The running count of the waste streams of this medium generated by this project.

Under this format, “CTO040-IR78-S02” would mean the following:

- CTO040**-IR78-S02      The waste was generated for work conducted under CTO 040.
- CTO040-**IR78**-S02      The waste was generated at Site IR78.
- CTO040-IR78-**S02**      The waste is soil.
- CTO040-IR78-**S02**      This is the second soil profile generated by this project.

Base personnel will provide any required generator certification and/or signatures. Signed profile(s) will then be submitted to the appropriate offsite disposal facility (see **Section 7**) for approval.

The profile for offsite disposal typically requires the following information but may have additional requirements:

- Generator information including United States Environmental Protection Agency (USEPA) Generator Identification (ID) Number (see **Section 4.2** for generator number), name, mailing address, contact, and phone number
- Site name and street address

- Process generating waste (such as soil removal or well installation)
- Source of contamination
- Historical use for area
- Waste composition
- Physical state of waste
- Applicable hazardous waste codes

The offsite disposal facility will be approved by the regional environmental manager before a contract for disposal is awarded. The facility will have the certifications and permits listed in **Section 7**. A copy of the waste profile or approval letter will be received from the disposal facility before scheduling offsite transportation of the waste.

# Waste Management

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## 4.1 Waste Storage Time Limit

Based on historical waste characterization results, hazardous wastes are not expected to be generated. Even though all generated soil, debris, and liquids are assumed to be non-hazardous for management purposes (unless there are indications otherwise), samples will be collected and wastes will be characterized according to the results of sample analyses. All CERCLA or RCRA site-related waste should be disposed of within 90 days of the accumulation start date. Soils generated under the UST Guidance must be disposed within 45 days of when the drums and containers are full. Unauthorized storage of soil or storage in excess of 45 days may be considered a violation of General Statutes (GS) 143-215.1.

To facilitate tracking, each container will be assigned a unique number using the following format:

*Profile Tracking Number-Event Number-Count Number/Total Count*

An explanation of each of these identifiers is given below.

<b>Profile Tracking Number</b>	Number identifying the waste stream associated with the container. <b>Section 3</b> of this WMP provides more information.
<b>Event Number</b>	The running count of events where this profile has been used.
<b>Count Number</b>	The running count of drums related to this waste profile number generated during this event.
<b>Total Count</b>	The total number of drums generated during this event.

Under this format, “CTO040-IR78-S02-02-05/10” would mean the following:

<b><u>CTO040-IR78-S02</u></b> -02-05-10	This waste stream is associated with this profile number
CTO040-IR78-S02- <b><u>02</u></b> -05-10	This is the second field event that will utilize this profile
CTO040-IR78-S02-02- <b><u>05</u></b> /10	This is the fifth container related to this profile that was generated during this event
CTO040-IR78-S02-02-05/ <b><u>10</u></b>	Ten containers that are related to this profile were generated during this event

## 4.2 Labels

Waste containers will be labeled in accordance with 49 CFR 172, 173, and 178. Labels will include the container ID number, type of waste, location from which the waste was generated, and accumulation start date (the date that waste first enters the container). Containers and portable tanks used to store/accumulate waste (including soil and groundwater) will be clearly marked with and include one of the following labels:

### “Analysis Pending”

Temporary or handwritten label used until analytical results are received and reviewed. This label will include the container ID number, generator information, site, and accumulation start date. If the waste is produced from CERCLA or CERCLA-like work, the words, “CERCLA derived” must also be on the label. If the label is handwritten, a paint pen should be used.

## “Hazardous Waste”

Pre-printed hazardous waste labels with the following information:

- Accumulation start date
- Generator name
- USEPA ID number:
  - For IDW and RDW generated aboard MCIEAST-MCB CAMLEJ (Mainside, Courthouse Bay, Greater Sandy Run Area, Camp Geiger, and Air Station [**Attachment 1**]) (**Figure 2-2**): NC6170022580
- Waste codes
- Container ID (see **Section 4.1**)
- Prior to transport, the manifest number must be added (for containers of less than 110-gallon capacity)

## “Non-Hazardous Waste”

Preprinted labels with the following information:

- Accumulation start date
- Generator name and telephone number
- Waste-specific information (for example, contaminated soil)
- Container ID
- Where applicable, the major hazards (such as flammable, oxidizer, or carcinogen) will be included on the label
- Large containers such as roll-off boxes may require more than one label

## 4.3 Containers and Accumulation

Waste materials will be collected in drums, bulk containers, or stockpiles. Containers will be staged in a fenced and secured area pending characterization and disposal. Roll-off containers used to accumulate waste will be lined and covered to await transportation and disposal. Hazardous wastes will be segregated from non-hazardous wastes. Incompatible wastes such as flammable and corrosive wastes also will be segregated. Wastes of the same matrix, contamination, and source may be aggregated to facilitate storage and disposal.

Generally, waste containers will be moved to secure locations approved by EMD (such as the S-960 facility bays on Michael Road [**Figure 2-2**] or a secure area onsite) as part of demobilization. The location of Building S-960 is shown on **Figure 2-2**. Site conditions may warrant the movement of containers to secure locations more frequently, as determined by EMD.

Some staging locations may require secondary containment. The design requirements for secondary containment will be included in site or project-specific work plans. The responsible contractor will coordinate with EMD to ensure that any inspections required by Clean Water Act regulations or permits prior to discharging stormwater from the containment area are conducted and properly documented.

If secondary containment is not used, the following considerations must be taken into account:

- The waste staging area will have the appropriate equipment and PPE required to contain and clean-up a spill to the ground surface.
- In the event that a leak occurs, the affected ground surface will need to be removed and disposed of, or calculations must be made in a memo-to-file for the Base showing that the leak could not have caused the impacted soil to have concentrations of contaminants exceeding North Carolina Soil Screening Levels (NC SSLs).
- If the drum staging area will be in the path of sheet flow from rain events, basic diversions will need to be constructed to protect the drums and containers.

Waste will be staged in the storage bays at Building S-960 on Michael Road unless another secure location is approved by EMD. Operating hours for this facility are from 0700 – 1630 Monday through Friday ([910] 451-1482). If hazardous waste is generated, it will be stored at the less-than-90-day storage facility in Building S-962

on Michael Road ([910] 451-5306). This less-than-90-day storage area contains appropriate emergency response equipment. This equipment includes a fire extinguisher, spill response equipment, and appropriate PPE. Arrangements will be made with the Base for hazardous wastes to be stored at this location until disposal. Transportation of waste from its originating site to its temporary storage location, whether it be the 90-day storage facility on Michael Road (Building S-960) or an approved secure location, is exempt of the transportation requirements outlined in **Section 6** so long as travel is only conducted within MCIEAST-MCB CAMLEJ boundaries or roads adjacent to Base property, as outlined in 40 CFR 262.20(f). A certified waste transportation contractor must be hired to move hazardous waste on an off-Base road that is not adjacent to the property line.

All containers will be inspected upon arrival at the site for disrepair and for any contamination or contents left from previous customers. If a container contains waste upon arrival or is in disrepair, it will be rejected and documented.

The decision as to whether to use small or bulk containers is a management decision that depends on several criteria. The following will be considered when selecting containers:

- Compatibility with waste
- Storage location capacity
- Anticipated method of disposal and the containers that the disposal facility will accept
- Method of transportation
- Number of characterization samples required
- The effect of aggregating waste in bulk containers on the overall management of waste

#### 4.3.1 Drums and Small Containers

- Drums will be inspected and inventoried upon arrival onsite for signs of contamination and/or deterioration.
- Adequate aisle space (at least 30 inches) will be provided for containers such as 55-gallon drums to allow the unobstructed movement of personnel and equipment. Drums will be arranged in rows that are not more than two drums wide (**Figure 4-1**).
- Each drum will be provided with its own label, and labels will be visible and clearly marked.
- Drums will remain closed, with all locking mechanisms engaged, except when removing or adding waste to the drum.
- Drums will be disposed of with the contents. If the contents are removed from the drums for offsite transportation and treatment or disposal, the drums will be decontaminated before re-use or before leaving the site.
- Drums containing liquids or hazardous waste will be provided with secondary containment.
- Drums will be filled no more than three-quarters full.

#### 4.3.2 Roll-off Boxes

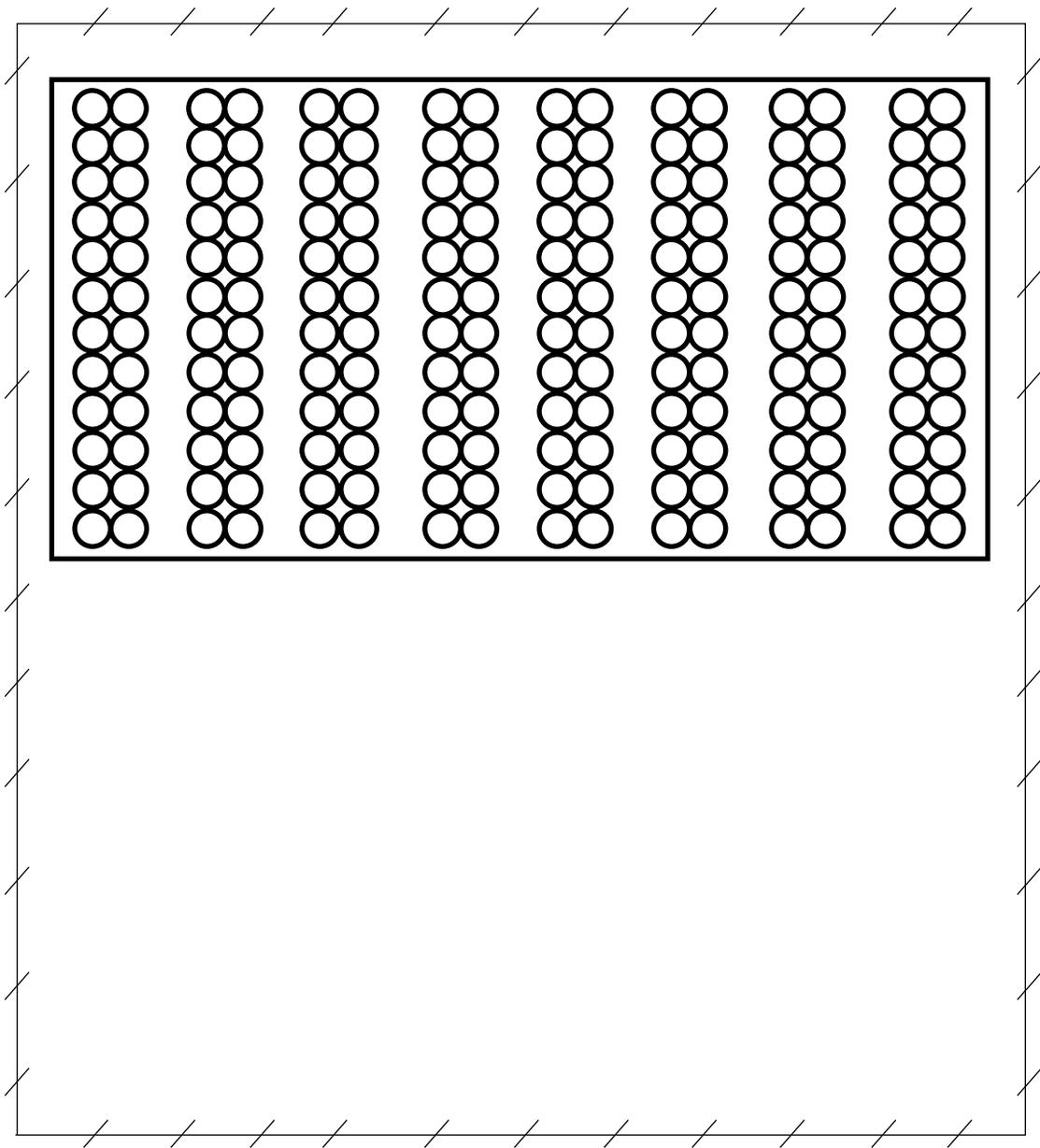
- Roll-off boxes will be inspected upon arrival onsite. Any roll-off container arriving with contents or in poor condition will be rejected.
- Roll-off boxes will be provided with covers and disposable liners. Liners will be disposed of as contaminated debris along with the soil.
- When not in use, securely fastened covers will be installed on all roll-off boxes.
- Old labels will be removed or completely obliterated, and a new, appropriate label will be applied, as discussed in **Section 4.2**.
- Roll-off containers will be inspected by the transporter after removal of the liner and decontaminated in the event of evidence of liner failure.

### 4.3.3 Portable Tanks

- Portable tanks will be inspected upon arrival onsite for signs of deterioration and contamination. Any tank arriving onsite with contents or in poor condition will be rejected.
- Portable tanks will be provided with covers and secondary containment.
- Only non-stationary tanks (such as a cargo tank or other wheeled tank) will be used to accumulate hazardous waste.
- Each tank will be labeled as discussed in **Section 4.2**.

### 4.3.4 Soil Stockpiles

- Stockpiles of contaminated soil will be located near the excavation areas and within an area of existing contamination.
- Stockpiles will be provided with liners, covers, and perimeter berms to prevent release or infiltration of liquids.
  - A minimum of 10- and 6-millimeter polyethylene sheeting will be used for liners and covers, respectively.
  - A perimeter berm will be constructed of clean materials (such as hay bales under the liner) and will allow for collection of any free liquids draining from the stockpile.
  - Accumulated free liquids will be pumped to a container or tank.
- Covers and perimeter berms will be secured in-place when not in use and at the end of each work day, or as necessary to prevent wind dispersion or run-off from major precipitation events.
- Construction materials for the stockpiles that contact contaminated soil will be disposed of as contaminated debris.
- Accumulation start dates will be recorded on a log or a sign located at the stockpile.



LEGEND

○ DOT 55-gallon drum

—/— Fence

▭ Secondary Containment



FIGURE 4-1  
Drum Staging with Secondary Containment  
Waste Management Plan  
MCIEAST-MCB CAMLEJ, North Carolina

## SECTION 5

# Shipping Documentation

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Before offsite disposal of any waste, the responsible contractor will provide the Base with a profile package for each waste stream. This package will include a waste profile naming MCIEAST-MCB CAMLEJ as the generator of the waste, analytical summary table(s) applicable to the waste, a completed waste manifest, and any other applicable information necessary for the Base Resource Conservation and Recovery Section to complete its review of the disposal package and sign as the generator. **The waste profile and waste manifest can be signed by designated EMD personnel only.** The points of contact for EMD/RCRS are Gene Jones (910-451-3496) and Tony Recob (910-451-5306).

The signed profile will be submitted to the disposal facility for acceptance and approval. Once the approved profile or approval letter is received from the disposal facility, transportation can be scheduled.

Each load of waste material will be manifested before leaving the site. At a minimum, the manifest form will include the following information:

- Generator information including name, address, contact, phone number, and USEPA ID number
- Transporter information including name, address, contact, phone number, and USEPA ID number
- Facility information including name, address, phone number, and USEPA ID number
- Site name including street and mailing address
- United States Department of Transportation (DOT) proper shipping name
- Types and numbers of containers
- Quantity of waste (volumetric estimate)
- Disposal facility profile number and/or approval code
- Twenty-four-hour emergency response phone number
- MCIEAST-MCB CAMLEJ profile tracking number

Additionally, each shipment of bulk waste will also have a weight ticket.

The generator and the transporter must sign the manifest prior to the load of waste leaving the site. A copy of this manifest will be retained by Base personnel. The original signed manifest will be returned to the address of the generator. The disposal facility will provide a copy of the facility-signed manifest to the Base.

If the signed hazardous waste manifest has not been received by EMD within 45 days, the responsible contractor will prepare an Exception Report for the Base to submit to the State of North Carolina, as required under 40 CFR 262.42 and as referenced by 15 North Carolina Administration Code (NCAC) 13A .0107(b).

While Marine Corps Air Station (MCAS) New River maintains a separate EPA ID number (NC8170022570) as a hazardous waste generator, the MCIEAST – MCB CAMLEJ EPA ID number (NC6170022580) listed in **Section 4.2** should be used for all IDW or RDW generated from CERCLA, RCRA, UST, and non-UST POL investigation and remediation sites. Refer to **Attachment 1** for further guidance.

## SECTION 6

# Transportation for Off-Site Disposal

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Each transportation vehicle will be inspected before waste is loaded by the responsible contractor. This inspection will be documented. The quantities of waste being transported and its final destination will be recorded in the field notes for the day. A contractor licensed for commercial transportation will transport non-hazardous wastes. If the wastes are hazardous, the transporter must have a USEPA ID number and must comply with transportation requirements outlined in 49 CFR 171-179 (DOT) and 40 CFR 263.11 and 263.31 (Hazardous Waste Transportation). A copy of the documentation indicating that the selected transporter has appropriate licenses will be received and approved by the responsible contractor before any waste is transported.

The transporter will be responsible for weighing loads at a certified scale. For each load of material, weight measurements will be obtained for each full and empty container, dump truck, or tanker truck. Disposal quantities will be based on the difference of weight measurements between the full and empty container and dump truck. Weights will be recorded on the waste manifest. The transporter will provide copies of weight tickets to the responsible contractor.

The transporter will observe the following practices when hauling and transporting wastes offsite:

- Minimize impacts to general public traffic
- Repair road damage caused by construction and/or hauling traffic
- Clean-up waste spilled in transit
- Line and cover trucks and trailers used for hauling contaminated waste to prevent releases and contamination
- Decontaminate vehicles before re-use
- Seal trucks transporting liquids
- All personnel involved in offsite disposal activities will follow safety and spill response procedures outlined in the site-specific Health and Safety Plan

# Disposal

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The responsible contractor will assess the potential hazards posed by wastes and submit waste management recommendations to the Base. If test results indicate that a waste is not hazardous, the responsible contractor will recommend that soil waste be disposed at a non-hazardous landfill, that wastewater be disposed of at an industrial WWTP, and that PPE and expendable sampling items be disposed of in a trash dumpster with other non-hazardous trash generated at the Base.

## 7.1 Onsite Disposal

The Base manages a landfill onsite where soil that is non-hazardous and contains no POL can be disposed of. Analytical results will be submitted to the Base to determine if waste solids can be disposed of there. If the waste is approved for onsite disposal, the Base will generate a waste profile form and provide instructions for disposal. Transportation will need to be provided by a waste hauler with the appropriate qualifications, as described in **Section 6**. Waste characterization documentation should accompany waste to the Base landfill. If landfill personnel are unable to verify the disposal authorization, the Base IR or UST manager should be contacted as is appropriate.

PPE and other debris associated with the generation of non-hazardous waste will be collected and secured in black, non-translucent trash bags and disposed of at the Base.

## 7.2 Offsite Disposal

For offsite disposal of wastes, disposal facilities with proper permits and in good standing with the state and federal agencies will be used. Permits and standing information will be received and approved by the responsible contractor prior to the profiling of any waste.

Offsite disposal of waste generated during UST corrective action must adhere to the disposal requirements as outlined in Section 6.0 of the UST Guidance. Offsite disposal of waste generated during non-UST petroleum releases must adhere to the disposal requirements as outlined in Section 14.0 of the Non-UST Petroleum Release Guidance.

Wastes generated during CERCLA or CERCLA-like work that is shipped offsite may only be transferred to a facility that has been reviewed by the USEPA Region under the CERCLA Offsite Rule (40 CFR 300.440) and found to be acceptable. This approval is in addition to the facility's USEPA or state permit, and the disposal facility must show proof of its approval in addition to its RCRA facility or wastewater treatment permit.

Offsite treatment and disposal facilities will use their waste profile and supporting documentation (analytical data) to determine whether they will accept a waste:

- Non-hazardous wastes will be disposed at an offsite RCRA Subtitle D facility permitted to receive such wastes or at an offsite wastewater treatment facility permitted to receive such wastes.
- Construction debris that has not come in contact with contaminated media or is generated from a CERCLA site that has reached No Further Action (NFA) may be sent to municipal landfills, or landfills designated for construction and demolition debris.
- Hazardous wastes will be disposed of at an offsite, permitted, RCRA Subtitle C treatment, storage, or disposal facility.
- PPE associated with the generation of hazardous waste will be properly contained and disposed of at an offsite, permitted, RCRA Subtitle C treatment, storage, or disposal facility.

The treatment and disposal facility will be responsible for providing a copy of the final facility-signed waste manifest and a certificate of treatment or disposal for each load of waste received.

## SECTION 8

# Recordkeeping

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Records concerning waste management will be maintained. The responsible contractor will track wastes from generation to transportation offsite either in field notes or a form similar to the transportation and disposal log provided in **Attachment 2**. A specific inventory of each container and stockpile will be maintained, and all waste will be logged the day that it is generated and inventoried the day of transportation. The responsible contractor will maintain copies of the following records:

- Waste analytical results
- Waste profiles (and any required supporting documentation)
- Manifests, land disposal restriction notifications (only for hazardous waste), certificates of disposal, destruction, and recycle (as needed for site/project specific reporting)
- Field notes documenting waste tracking
- Field notes documenting waste management, including the volumes and methods of disposal, if applicable

The Base, as the generator, will maintain waste management documents as part of its operating records in accordance with its policies. The Base maintains the following:

- Waste analytical results
- Waste profiles (and any required supporting documentation)
- Manifests, land disposal restriction notifications (only for hazardous waste), certificates of disposal, destruction, and recycle

**Attachment 1**  
**NCDENR Email - IDW/RDW Management for**  
**MCIEAST-MCB CAMLEJ**

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## Twamley, Erin/RDU

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**From:** Patterson, Jenny [<mailto:jenny.patterson@ncdenr.gov>]

**Sent:** Monday, June 24, 2013 10:52 PM

**To:** Rychak CIV Charity M

**Cc:** Hartzell, Beth; Recob CIV Anthony L; Kropinack CIV Kirk R; Reid CIV Merrick C; Oneal, Katherine; Nelms, Robert

**Subject:** RE: IDW at Camp Lejeune

Good Morning,

Thank you for sending the detailed summary. The Hazardous Waste Section will allow your request as stated below.

Please let me know if you have any questions or need additional information as it pertains to this request.

Thank you,

Jenny

Jenny Patterson, CHMM  
Eastern Region Compliance Supervisor  
Hazardous Waste Section -Division of Waste Management  
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**From:** Rychak CIV Charity M [<mailto:charity.rychak@usmc.mil>]

**Sent:** Thursday, June 13, 2013 10:27 AM

**To:** Patterson, Jenny

**Cc:** Hartzell, Beth; Recob CIV Anthony L; Kropinack CIV Kirk R; Reid CIV Merrick C

**Subject:** RE: IDW at Camp Lejeune

Good morning Ms. Patterson,

As requested I'm sending you a follow-up email per our discussion on Monday, June 10, 2013, to clarify our request with regards to management of hazardous and non-hazardous waste generated aboard our property.

We respectfully request clarification on the management of waste (both hazardous and non-hazardous) generated aboard Marine Corps Air Station (MCAS) New River property as part of investigation and remediation activities. As you are aware, there are two EPA Generator ID numbers for Camp Lejeune: one for MCAS New River (EPA ID # NC8170022570) and one for the rest of Camp Lejeune (EPA ID # NC6170022580). Our Hazardous and Solid Waste Amendments Permit (NC6170022580 R2), however, covers both Camp Lejeune and MCAS New River.

We would like to be able to handle all investigation and remediation waste for sites listed in the HSWA permit under the Camp Lejeune EPA ID number. This would include all wastes generated during investigation and remedial activities at

Camp Lejeune Environmental Restoration Program sites (CERCLA), Resource Conservation and Recovery Act (RCRA) solid waste management units (SWMUs), and underground storage tank (UST) remediation sites only. We request this to simplify requirements for handling waste from remediation/corrective action sites, as our remediation sites can sometimes be co-located on MCAS property and Camp Lejeune property. In addition, Camp Lejeune is responsible for management and implementation of all CERCLA and RCRA remedial activities aboard Camp Lejeune and MCAS New River. Utilizing the Camp Lejeune EPA ID for all CERCLA and RCRA remedial activities will maintain consistency in personnel and minimize the possibility of error in documentation.

The 90-day facility on Camp Lejeune (Bldg S-962) will be used for temporary storage of all IDW (unless a location can be secured at the originating site) and hazardous waste generated from these sites. Transportation to the Mainside 90-day storage facility from MCAS New River and other locations aboard Camp Lejeune will be conducted under the provisions of 40 CFR 262.20(f) (as adopted by 15A NCAC 13A.0107).

Hazardous wastes generated aboard MCAS New River as part of their operational processes will continue to be managed under the MCAS New River EPA ID and will be stored in the 90-day facility on MCAS New River (Bldg AS-4225). This would include any spills that might occur as part of current MCAS New River operations (i.e., within a maintenance bay at MCAS New River).

If you are agreeable to this, we will update our Investigation and Remediation Waste Management Plan, which is provided to NCDENR and the EPA for concurrence under the CERCLA Partnering Process.

Thanks much,

Charity M. Rychak, P.E.  
Environmental Engineer  
G-F/EMD/EQB  
12 Post Lane  
Camp Lejeune, NC 28547

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**Attachment 2**  
**Transportation and Disposal Log**

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# Transportation and Disposal Log

Location  
Site

Task Description  
Staging Location(s)

Project Number  
(Sub)Contractor

<b>Container ID</b>				
<b>Boring/Well Number</b>				
<b>Container Type</b>				
<b>Waste Profile No</b>				
<b>Accumulation Start Date</b>				
<b>Date Transported to Staging Location</b>				
<b>Comments/Notes</b>				

**Note:** All waste should be included on the Waste Tracking Log from the moment of generation.

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