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ACCIDENT PREVENTION PLAN FOR VAPOR INTRUSION SAMPLING AND INTERIM  
MEASURES SUPPORT SOLID WASTE MANAGEMENT UNIT 16 (SWMU 16) CAST HIGH  
EXPLOSIVES FILL/B-146 INCINERATOR BUILDING 146 NSA CRANE IN  
8/1/2013  
TETRA TECH

**Accident Prevention Plan  
for  
Vapor Intrusion Sampling  
And Interim Measures Support  
for  
SWMU 16 Cast High Explosive Fill/B-146  
Incinerator - Building 146  
  
Naval Support Activity (NSA) Crane  
Crane, Indiana**



**Naval Facilities Engineering Command**

**Contract No. N62470-08-D-1001  
Contract Task Order F276**

**August 2013**

**ACCIDENT PREVENTION PLAN  
FOR  
VAPOR INTRUSION SAMPLING  
AND INTERIM MEASURES SUPPORT  
FOR  
SWMU 16 CAST HIGH EXPLOSIVE FILL/B-146  
INCINERATOR - BUILDING 146**

**NAVAL SUPPORT ACTIVITY (NSA) CRANE  
CRANE, INDIANA**

**Prepared for:**

**Naval Facilities Engineering Command Midwest  
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Great Lakes, Illinois 60088**

**Submitted by:**

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**Prepared under:**

**Contract No. N62470-08-D-1001  
Contract Task Order F276**

**Revision 0  
August 2013**

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### ATTACHMENTS

- I Site-Specific Training Documentation Form and Employee Training/Qualifications/Medical Clearance
- II OSHA Poster

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## ACRONYMS

§	Section
ACGIH	American Conference of Governmental Industrial Hygienists
AHA	Activity Hazard Analysis
APP	Accident Prevention Plan
BBP	Bloodborne Pathogen
BG	Background
BLS	Bureau of Labor Statistics
C	Centigrade or Celsius
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CLEAN	Comprehensive Long - Term Environmental Action Navy
CPR	Cardiopulmonary Resuscitation
CRZ	Contamination Reduction Zone
CSP	Certified Safety Professional
TO	Task Order
DART	Days Away/Restricted Duty/Transfer
dB	decibels
DEET	n,n-diethyl-meta-toluamide
DOD	Department of Defense
DOT	Department of Transportation
EM	Engineer Manual
EPA	Environmental Protection Agency
F	Fahrenheit
FOL/SSO	Field Operations Leader/Site Safety Officer
FSP	Field Sampling Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSM	Health and Safety Manager
IDW	Investigative Derived Waste
IM	Interim Measures
lbs	pounds
mg/kg	milligrams per kilogram
mg/m <sup>3</sup>	milligrams per cubic meter
mm	millimeter
NAICS	North American Industry Classification System
NRR	Noise Reduction Rating

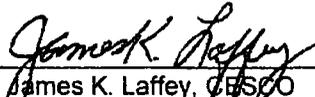
NSA	Naval Support Activity
OEL	Occupational Exposure Limit
OSHA	Occupational Safety and Health Administration (U.S. Department of Labor)
PHSO	Project Health and Safety Officer
PM	Project Manager
POC	Point of Contact
PPE	Personal Protective Equipment
RAC	Risk Assessment Code
RCIR	Recordable Case Incident Rate
RPM	Remedial Project Manager
SOP	Standard Operating Procedure
SSHP	Site Safety and Health Plan
TSS	Technical Support Services
TP	Technical Paper
TWA	Time-Weighted Average
USACE	United States Army Corps of Engineers

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## 1.0 SIGNATURE SHEET

By their signature, the undersigned hereby certify that this Accident Prevention Plan (APP) has been prepared in accordance with the United States Army Corps of Engineers (USACE) Engineering Manual (EM) 385-1-1, and has been reviewed and approved for use during field operations at Naval Support Activity (NSA) Crane, Indiana.

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James K. Laffey, CFSO  
Senior Health and Safety Specialist-Plan Preparer (412) 921-8678

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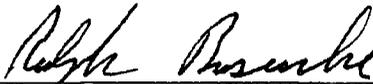
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Vice President and Program Health and Safety Manager – Plan Concurrence (412) 921-8912

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Ralph Basinski  
Project Manager - Plan Concurrence (412) 921-1173

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## **2.0 BACKGROUND INFORMATION**

### **2.1 CONTRACTOR**

Tetra Tech, Inc. (Tetra Tech) will conduct the field activities identified in this Accident Prevention Plan (APP).

### **2.2 CONTRACT NUMBER**

This work is authorized under the Comprehensive Long - Term Environmental Action Navy (CLEAN) contract, administered through the U.S. Navy Southeast, Naval Facilities Engineering Command (NAVFAC), as defined under Contract No. N62470-08-D-0001; Contract Task Order (CTO) F276.

### **2.3 PROJECT NAME**

Vapor Intrusion (VI) Sampling for Solid Waste Management Unit (SWMU) 16 - Cast High Explosives Fill/Building 146 (B-146) Incinerator at the Naval Support Activity (NSA) Crane, Indiana.

### **2.4 PROJECT DESCRIPTION**

The objective of this CTO is to collect information by collecting sub-slab and indoor air samples to determine if chlorinated solvent and degradation product vapors are entering the B-146 air space at concentrations that present significant risk to human health.

Tetra Tech is also assisting the Navy by providing excavation oversight and confirmatory sampling at SWMU 16 for an Interim Measures (IM) Contractor. The IM work plan (prepared by Tetra Tech) includes the excavation and off-site disposal of accessible contaminated soils within SWMU 16. The contaminated soils to be removed have been identified as soil source areas containing concentrations of contaminants in excess of the media cleanup standard (MCS). At the completion of the IM and following removal of the support facilities (e.g., dewatering pad, decontamination pad, and material storage area, etc.), Tetra Tech will collect verification samples to confirm that lining systems of the support facilities did not fail during implementation of the IM.

### **2.5 LOCATION**

NSA Crane is located in a rural, sparsely populated region of south-central Indiana, approximately 75 miles southwest of Indianapolis and 71 miles northwest of Louisville, Kentucky immediately east of NSA

Crane Village and Burns City. SWMU 16 is located in the north-central portion of NSA Crane. See Figure 2-1.

## **2.6 PHASES OF WORK REQUIRING ACTIVITY HAZARD ANALYSIS (AHA)**

The specific tasks anticipated to be involved with this effort are listed below:

- Mobilization/demobilization
- Sub Slab Vapor Sampling and Indoor Air Monitoring Sampling
- Excavation Oversight and Soil Sampling

### 3.0 STATEMENT OF SAFETY AND HEALTH POLICY

Tetra Tech is committed to providing our employees with a safe and healthful workplace. It is the goal of Tetra Tech to continue excellent safety performance on NAVFAC contracts to support the Navy in their safety efforts. Specifically, Tetra Tech will perform work in a manner that is consistent with the Zero Incident Philosophy. It is our goal to plan and perform the work in a manner that integrates safety and health considerations so that worker injuries or illnesses, environmental releases/impacts, or property damage are eliminated. In addition to the line and staff management functions described in this APP, each individual performing work under this contract has the responsibility for his/her own personal health and safety, as well as for assisting in assuring the health and safety of co-workers. This element is also the first one listed in our corporate Health and Safety Policy Statement, which requires that employees "recognize a *personal* responsibility for their own health and safety and for actions that affect the health and safety of fellow employees." This employee responsibility includes observing specified health and safety requirements and communicating with the designated Field Operations Leader 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, 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 is communicated to employees through meetings, postings, written communications, and reporting of hazards.

This APP establishes the requirements that the Site Safety and Health Officer (SSHO) must follow to respond to changing conditions by knowing when to stop work and call for additional guidance from a Certified Industrial Hygienist (CIH)/Certified Safety Professional (CSP). The Project Health and Safety Manager (PHSM) will provide the SSHO with additional information, or request additional information, in order to fully evaluate the situation. This type of communication provides the SSHO with the necessary support and knowledge to equip the workers with the required protection either through adjustment to the work procedures, or through additional techniques, tools, or equipment. Personal protective equipment (PPE) may be altered to provide additional protection to the workers, based on the information provided by the SSHO to the PHSM. This APP also delineates health and safety responsibilities and assigns those responsibilities to project and office personnel.

**3.1 TETRA TECH SAFETY STATISTICS**

Table 3-1 presents safety statistics for Tetra Tech (NUS Division) for the last 3 calendar years compared to the national averages for our industry. This comparison uses data collected by the United States 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 TETRA TECH AND 2011 BLS DATA FOR  
NAICS CODE 541 (RCIR AND DART CASE RATES)**

	<b>NAICS 541 Professional Scientific and Technical Services 2011</b>	<b>Tetra Tech 2010</b>	<b>Tetra Tech 2011</b>	<b>Tetra Tech 2012</b>
<b>Total Recordable Case Incident Rate (RCIR)</b>	1.0	0.6	0	1.0
<b>Days Away/Restricted Duty/Transfer Case Rate (DART)</b>	0.3	0.2	0	0.2

The data comparison illustrates that Tetra Tech's performance compares favorably with the most-recent national averages for the environmental engineering and hazardous waste services industries. Raw data for these statistics can be found in the OSHA Form 300 and 300A attached (see Figure 3-1).

**Tetra Tech Man Hours Worked**

2010	900,132
2011	872,801
2012	994,740

**Tetra Tech Experience Modification Rates  
(Policy Year October 1 - September 30):**

2009-2010:	0.74
2010-2011:	0.76
2011-2012:	0.76

## **4.0 RESPONSIBILITIES AND LINES OF AUTHORITY**

### **4.1 STATEMENT OF RESPONSIBILITY**

Tetra Tech, as the employer for staff that will be engaged in performing the work presented in this APP, fully recognizes and accepts ultimate responsibility for protecting the safety and health of our employees, and for the implementation of an effective Safety and Occupational Health program. No person shall 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 defines responsibility for safety and health for Tetra Tech employees engaged in onsite activities. Personnel assigned to these positions will exercise the primary responsibility for onsite health and safety. These persons will be the primary point of contact for any questions regarding the safety and health procedures and the selected control measures that are to be implemented for onsite activities.

#### **4.2.1 Navy Personnel**

The Navy personnel primarily responsible for this project are Mr. Howard Hickey who is the Remedial Project Manager (RPM) and Mr. Thomas Brent who is the Facility Point of Contact (POC).

#### **4.2.2 Tetra Tech Personnel**

##### **4.2.2.1 Project Manager– *Ralph Basinski***

The Tetra Tech PM is responsible for the overall direction and implementation of health and safety for this work. The PM coordinates closely with the RPM who is responsible to oversee the project implementation, including scoping, data review, and evaluation for the USACE. This includes the responsibility for ensuring that:

- Work is appropriately planned and executed in accordance with contractual, regulatory, and internal requirements
- Adequate resources (including personnel, equipment, and supplies) are assembled, and made available to the FOL/SSO to safely and effectively accomplish the work.
- Ensure implementation of this APP through coordination with the HSM, and the PHSM, as applicable.

- Conduct periodic inspections.
- Participate in the incident investigations.
- Ensure APP has the required approvals before any site work is conducted.
- Ensure that the PHSM and HSM are informed of project scope changes that require modifications of the APP.
- Assume overall project responsibility for health and safety.
- Ensure that adequate resources are provided to the field staff to carry out their responsibilities as outlined below.

Mr. Basinski has a total of over 30 years of professional environmental experience. Currently he acts as the Department Manager of the Munitions Response Program Department and project manager and/or project technical expert for DoD clients on munitions response program (MRP) and open burning (OB) / open detonation (OD) Resource Conservation Recovery Act (RCRA) permitting projects. He serves as the coordinator of MRP support and project manager on MRP sites. He completes regulatory compliance assessments, prepares contents of permit applications, develops planning documents for environmental investigations, and provides regulatory interpretations and guidance for environmental permitting, environmental investigation, and engineering design and remediation projects including corrective measures studies. His training certifications include:

- 40-hour U.S. DOE Radiation Principles, 1986
- 40-hour DOE Environmental Assessment, 1986
- 40-Hour HAZWOPER Training, 29 CFR 1910.120 OSHA, 1988
- 8 Hour Refresher 29 CFR 1910.120 OSHA Refresher, annually, 2012

#### **4.2.2.2 Health and Safety Manager – Matthew Soltis, CIH, CSP**

The HSM is responsible for the development and administration of the company health and safety program. The HSM will act in an advisory capacity to PM and site personnel for project-specific health and safety issues. The Tetra Tech PM will establish a liaison between the RPM and the HSM on matters relating to health and safety. In the fulfillment of the duties of this position, the HSM will enlist the support of safety and occupational health professionals, as appropriate. The HSM is responsible for the following actions:

- Developing, maintaining, and overseeing implementation of this APP
- Visiting project sites as needed to audit the effectiveness of the APP
- Remaining available to respond to project emergencies
- Developing modifications to the APP, as needed

- Evaluating occupational exposure monitoring/air sampling data and adjusting APP as necessary
- Serving as a Quality Control staff member
- Approving the APP by signature

Mr. Soltis is an occupational safety, health and security professional with over 30 years of professional experience. He is dual-certified in comprehensive practice for both occupational safety and industrial hygiene (CSP and CIH) and he has achieved national recognition in his areas of expertise by the American Industrial Hygiene Association, and has been elected as a Fellow of that organization. He has provided technical and management services to a wide diversity of clients both in the United States and overseas. This experience has involved numerous industries including manufacturing, construction, chemical processing, energy generation/transmission, R&D, and environmental sectors. Mr. Soltis has also served as Adjunct Professor for the Indiana University of Pennsylvania Safety Sciences Department, teaching course work in the fields of safety engineering and industrial hygiene.

The work under this contract, including this field effort, is subject to a comprehensive health and safety program developed, designed, and implemented by Mr. Soltis. Mr. Soltis serves as Corporate Manager of Health and Safety for Tetra Tech Technical Support Services (TSS) and as the HSM for the planned work addressed in this APP. His training experience includes:

- 40-Hour HAZWOPER Training, 29 CFR 1910.120 OSHA, 1988
- 8 Hour Refresher 29 CFR 1910.120 OSHA Refresher, annually, 2012
- 8-Hour Supervisory Training, 29 CFR 1910.120 OSHA, 1990
- OSHA 10-hour Construction Safety Training #31-003300669
- FEMA IS-200 ICS for Single Resources and Initial Action Incidents. June, 2009

#### **4.2.2.3 Project Health and Safety Officer – James K. Laffey, CESCO**

The PHSO is responsible for developing this APP in accordance with applicable OSHA and USACE EM 385 1-1 regulations. Specific responsibilities include:

- Providing information regarding site contaminants and physical hazards associated with the site
- Establishing air monitoring and decontamination procedures
- Assigning personal protective equipment based on task and potential hazards
- Determining emergency response procedures and emergency contacts
- Stipulating training requirements and reviewing training and medical surveillance certificates
- Providing standard work practices to minimize potential injuries and exposures
- Modifying this APP, as necessary

Mr. Laffey has served as a PHSO for a wide variety of Environmental Investigation/Remediation Projects for USACE since 1993. He is a certified Environmental and Safety Compliance Officer (CESCO) #464375803 by the National Registry of Environmental Professionals. His experience involves CERCLA investigations, remedial action projects, and baseline characterization studies (estimated at over 100 different projects). In this capacity, he is responsible for identifying site chemical and physical hazards and developing the site-specific HASP, providing technical guidance to field personnel to control or minimize site hazards. He is a certified instructor for all the OSHA HAZWOPER training programs including the 40-hour initial training, 8-hour supervisory training, and 8-hour annual refresher training. He is certified by the FEMA and the USEPA as an Incident Command System Instructor for IS 100 through 400.

His training experience includes:

- OSHA Construction Safety and Health 30-hour Training #36-60070909, 2010
- OSHA 29 CFR 1910.120 40-hour HAZWOPER Training, 1990
- OSHA 29 CFR 1910.120 8-hour Annual Refresher Training 1991 - 2012
- OSHA 29 CFR 1910.120 Supervisory 1991 and Refresher Training 1992- 2012
- Safety in Excavation Training Course, 2002
- American Red Cross, First Aid and CPR/AED 2010

#### **4.2.2.4 Field Operations Leader/Site Safety Officer (FOL/SSO) – Chris Rumer**

The FOL/SSO is responsible for implementation of the project work plans in accordance with the APP, with the assistance of the FOL/SSO. The FOL manages field activities, executes the SAP, and enforces safety procedures as applicable to the SAP. Other duties include:

- Ensuring that the proper notifications are made prior to beginning work
- Verifying training and medical clearance of onsite personnel status in relation to site activities
- Selecting, applying, inspecting, and maintaining personal protective equipment
- Implementing Hazard Communication, Respiratory Protection Programs, and other health and safety programs as needed
- Providing site-specific training for onsite personnel
- Investigating accidents and injuries

Mr. Rumer is an Air Quality Specialist/Munitions Response Scientist and provides technical support relative to projects requiring air quality assessment, air dispersion modeling, environmental permitting, and meteorology. He has performed air dispersion modeling assessments for industrial facilities and

provided office and field support for the Munitions Response Program (MRP). He is familiar with air dispersion models such as: AERSCREEN, AERMOD View, CALPUFF View, and OBODM. Additionally, he calculates emission inventories using EPA AP-42 for a variety of industrial facilities that include natural gas production and aggregate processing. He also performs consequence analyses using RMP Comp and ALOHA. Mr. Rumer's training and certifications include:

- OSHA 1910.120 40-Hour HAZWOPER Training; December 2008
- OSHA 1910.120 8-Hour HAZWOPER Refresher; July 2012
- Data Quality Objective Training – QE3C, Inc.; September 2009
- CPR/First Aid Training – American Red Cross; September 2011
- Project Management I; September-October 2012
- AERMOD View – Air Dispersion Modeling Workshop; October 2012
- CALPUFF View – Air Dispersion Modeling Workshop; February 2013

As the Site Safety Officer the FOL/SSO is also responsible for ensuring that corrective measures have been implemented, appropriate internal and NSA Crane authorities have been notified, and follow-up reports have been completed. These duties may include the following:

- Select, inspect, implement, and maintain personal protective equipment
- Establish work zones and control points
- Implements air-monitoring program for onsite activities
- Verify training and medical status of onsite personnel status in relation to site activities
- Coordinate emergency services
- Provide site specific training for onsite personnel
- Investigate accidents and injuries
- Developing and maintaining current chemical inventories and Material Safety Data Sheets (MSDS)/Safety Data Sheets (SDS) files for hazardous chemicals that will be used/stored at that workplace
- Ensuring that onsite personnel who may use hazardous chemicals have access to and review pertinent MSDS/SDSs prior to using or dispensing such chemicals
- Ensuring compliance with container labeling requirements
- Providing input to the PHSO regarding the need to modify this APP or other health and safety documents as per site-specific requirements

Compliance with the requirements stipulated in this APP is monitored by the FOL/SSO and coordinated through the PHSO and HSM. The FOL/SSO must be notified of any on-site emergencies and is responsible for ensuring that the appropriate emergency procedures described in this section are

followed. The FOL/SSO is also responsible for informing the RPM of major incidents and associated corrective actions.

#### **4.2.2.6 Excavation Oversight/Sampling Personnel**

Individuals performing this work must coordinate with the IM contractor when working in and around the excavation sites.

Many of the requirements presented in this APP pertain only to Tetra Tech personnel. This individual has the responsibility to follow the IM contractor APP/SSHP and to supplement that information with Tetra Tech specific information found in this APP.

This employee's responsibility includes observing specified health and safety requirements and communicating with the IM contractor's FOL/SSO on matters such as the effectiveness of specified control measures, identification of new potential hazards, and other related issues. This person is responsible to:

- Collect soil samples from excavated areas.
- Report any unsafe or potentially hazardous conditions to the IM contractor's FOL/SSO.
- Report injuries, illnesses, spills, fires, and property damage to the IM contractor's FOL/SSO.
- Maintain knowledge of the information, instructions, and emergency actions in coordination with the IM contractor.
- Comply with rules, regulations, and procedures and any revisions that are instituted.
- Initiate the Incident Report when involved in an incident/accident set forth in this APP, if able to do so.
- Inspect the tools and equipment, including PPE, daily prior to use.
- Conduct daily operations check of electronic equipment and annotate in the logbook.

#### **4.2.2.7 Subcontractors and Suppliers**

Tetra Tech will not use subcontractor and supplies during this CTO.

### **4.3 STOP WORK AUTHORIZATION**

ALL employees are empowered, authorized, and responsible to STOP WORK at any time when an imminent and uncontrolled safety or health hazard is perceived. In a Stop Work event (immediately after the involved task has been shut down and the work area has been secured in a safe manner) the employee shall contact the PM and the Corporate Health and Safety Manager. Through observations

and communication, all parties involved shall then develop, communicate, and implement corrective actions necessary and appropriate to modify the task and to resume work.

#### **4.4 COMPETENT AND QUALIFIED PERSON(S)**

The competent and qualified person for this project is Mr. Chris Rumer. His resume and qualifications are listed in Section 4.2.2.5. A competent person is an individual who is capable of identifying existing and predictable hazards or working conditions that are hazardous, unsanitary, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate or control these hazards and conditions. The FOL/SSO has five years of field experience in environmental sampling, and safety and has detailed knowledge of and experience in air sampling situations.

#### **4.5 REQUIREMENT OF DESIGNATED COMPETENT PERSON ON SITE**

Work tasks at SWMU 16 will only be performed when the designated competent person is physically on the job site.

#### **4.6 REQUIREMENTS OF PRE-TASK SAFETY AND HEALTH ANALYSIS**

The FOL/SSO will conduct daily pre-shift tailgate safety meetings discussing the planned site activities, the hazards associated with each task, and the training required of personnel involved in these tasks. The related personal protective equipment or related work equipment will be inspected by the competent/qualified person before any work is started.

Tetra Tech requires that an Activity Hazard Analysis (AHA) be prepared for each job task to be performed at this site to identify hazards before they occur and provide mitigation measures. The AHAs focus on the relationship between the worker, the task, the tools, and the work environment. The AHAs are reviewed at the tailgate safety meeting at the beginning of each work day. These sessions inform each person of the potential hazards for each task and provide steps to take to eliminate or reduce hazards to an acceptable risk level. The AHAs are presented in the Section 10.0.

Personnel will be encouraged to report to the FOL/SSO any conditions or practices that they consider detrimental to their health or safety, or those they believe violate applicable health and safety standards. Such reports may be made orally or in writing. Personnel who believe that an imminent danger threatens human health or the environment are encouraged to bring the matter to the immediate attention of the FOL/SSO for resolution. Job site activities presenting danger to life or limb should be stopped immediately and reported to the FOL/SSO for resolution. Near miss incidents are to be reported to the FOL/SSO who will record the information in the site logbook and in the Tetra Tech TOTAL System.

At least one copy of this APP will be available to site personnel. Each vehicle used on the job site will contain a copy of the APP to ensure quick and easy access by employees. In addition to a review of the AHAs, minor changes and any other relevant topics will be discussed by the FOL/SSO at the daily tailgate safety meeting. However, significant revisions must be discussed with the HSM and PM and approved prior to implementation.

It is the goal of Tetra Tech to continue its excellent safety performance on USACE contracts. Specifically, Tetra Tech will perform the work in a manner that is consistent with the Zero Incident Philosophy. In accordance with this philosophy, it is our stated goal to plan and perform the work in a manner that integrates safety and health considerations so that it is accomplished without experiencing any worker injuries or illnesses, environmental releases/impacts, or property damage events.

#### **4.7 LINES OF AUTHORITY**

Personnel who will be working on this project are covered by this APP. These documents shall be rigorously enforced during this field effort. Violators of the APP will be verbally notified upon first violation, and the violation will be noted by the FOL/SSO in the field logbook. Upon second violation, the violator will be notified in writing, and the Tetra Tech PM and the violator's supervisor will be notified. A third violation will result in a written notification and the violator's eviction from the site. The written notification will be sent to the human resources department and the HSM.

Any violations that are deemed to be serious, intentional, or otherwise egregious will be subject to immediate corrective action, up to and including removal from the site, and will not require adherence to this progressive, three-step disciplinary process.

In the Tetra Tech Health and Safety Program Summary, it is stated by the company Chief Executive Officer Mr. Daniel L. Batrack, "Management is responsible for ensuring that all aspects of the workplace, including offices and project locations, are safe and that any risks, hazards, and safety violations are brought to their attention, investigated, and corrected promptly. Tetra Tech's associates are responsible for complying with the H&S policy, programs and standards, and conducting their work safely and without detriment to themselves, other employees, other individuals or property.

Compliance with this policy is mandatory. Willful violation or negligent disregard of this policy will be considered cause for disciplinary action up to and including termination."

#### **4.7.1 Policies and Procedures Regarding Noncompliance**

An employee's failure to adhere to the requirements of this Accident Prevention Plan, the Project Specific Work and Safety Plans, 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.

#### **4.7.2 Manager and Supervisor Accountability**

The purpose of the Tetra Tech corporate Health and Safety Program is to define the health and safety standards required on a corporate wide basis. The corporate Health and Safety Program applies to all Tetra Tech employees and sets forth minimum requirements for subcontractors working under contract to Tetra Tech. The responsibilities, organizational structure, recordkeeping requirements, and evaluation of Tetra Tech's corporate Health and Safety Program are outlined in detail in the Program Administration and Organizational Structure document:

- Senior Vice President of Administration has overall responsibility for the Tetra Tech corporate Health and Safety Program.
- Corporate Health and Safety Director
- Operational Unit Health and Safety Managers individuals assigned to health and safety administration within each Tetra Tech operating unit
- Operations Managers individuals who manage an office(s) within an operating unit of Tetra Tech
- Office Health and Safety Representative who is assigned to health and safety program-related functions within an office or long-term project location
- Project Managers who are responsible for managing a particular project or job.
- Site Safety Coordinators who provide health and safety oversight for a particular project site.
- Field personnel who are required to participate in appropriate health and safety programs and maintain their field-ready status.
- Each and every employee of Tetra Tech is responsible for upholding the standards established by the company.

An organization chart depicting the lines of authority is included as Figure 4-1.

## **5.0 SUBCONTRACTORS AND SUPPLIERS**

Tetra Tech will not employ subcontractors in the performance of work covered by this APP.

## **6.0 TRAINING**

Personnel who may be exposed to hazardous conditions and who will participate in site activities are required to meet the training requirements outlined in 29 CFR §1910.120, HAZWOPER. Furthermore, site personnel must satisfy any specialized training requirements that are presented in the AHAs for tasks to be completed on this project. Health and safety-related information will be communicated to employees through meetings, postings, written communications, and reporting of hazards.

### **6.1 NEW HIRE HEALTH AND SAFETY ORIENTATION**

Tetra Tech requires all new employees to attend orientation training which includes a review and sign off on the Employee Handbook. This employee handbook is a general guide to various personnel policies including the Health and Safety Program and employee benefits of Tetra Tech. Each new hire is required to view a video that explains basic safety policies at Tetra Tech. Prior to working in the field on their own they are required to spend a minimum of three days actual field experience under the direct supervision of a trained experienced supervisor.

### **6.2 MANDATORY TRAINING AND CERTIFICATIONS**

Tetra Tech personnel qualification and training certification documentation will be obtained by the PM and included in Attachment I and maintained on-site. Mandatory training and certifications applicable to this project include the following:

- 40 hours of introductory hazardous waste site training prior to performing work at SWMU 16.
- 8 hours of refresher training within the past 12 months before being cleared for site work. (Field personnel who have had introductory training more than 12 months prior to site work must complete this training again).
- 8-hour supervisory training in accordance with 29 CFR 1910.120(e)(4) will be required for site personnel operating in a supervisory capacity.

Documentation of Tetra Tech introductory, supervisory, and refresher training as well as site-specific training, will be maintained at the site. Copies of certificates or other official documentation will be used to fulfill this requirement.

### 6.3 SITE-SPECIFIC SAFETY AND HEALTH TRAINING

The FOL/SSO will provide site-specific training to Tetra Tech employees who will perform work on this project. In addition, a brief meeting will be held at the beginning of each day to discuss operations planned for that day and to review the appropriate AHAs with the planned task participants. Based on field activities, a short meeting may also be held at the end of the day to discuss the operations completed and any problems encountered.

Prior to accessing active work areas of the sites or participating in any intrusive activities, site personnel and visitors will first be required to undergo a site-specific safety and health training session conducted by the FOL/SSO, which will include a review of the APP and signing of the Site-Specific Training Documentation form.

Before site activities begin, the Tetra Tech FOL/SSO will present a briefing for site personnel who will participate in on-site activities. The following topics will be addressed during the pre-work briefing:

- Names of the personnel listed in the organizational chart and designated alternates
- Site history
- Work tasks
- Hazardous chemicals that may be encountered
- Physical hazards that may be encountered
- PPE, including types of respiratory and hearing protection to be used for work tasks
- Mandatory training and certification requirements (e.g., HAZWOPER, first aid, etc.)
- Environmental surveillance (air monitoring) equipment use and maintenance
- Action levels and situations requiring an upgrade or downgrade of level of protection
- Site control measures including site communications and control zones
- Decontamination procedures
- Emergency communication signals and codes, including incident reporting procedures
- Environmental accident/emergency procedures
- Personnel exposure and accident emergency procedures
- Fire and explosion emergency procedures
- Emergency telephone numbers
- Emergency routes

Any other health and safety-related issues that may arise before site activities begin will be covered during the pre-work briefing.

#### **6.4 HAZARD COMMUNICATION TRAINING**

In accordance with the OSHA Hazard Communication Standard (29 CFR 1920.1200 and 29 CFR 1926.59), copies of MSDS/SDSs for hazardous chemical materials that are used during site operations or that may be present on site will be available on site from the SSHO. The SSHO will conduct hazard communication (HAZCOM) training in accordance with 29 CFR 1920.1200 and 29 CFR 1926.59, Engineer Manual (EM) 385-1-1 (current version), and the HAZCOM program. Training will include, but is not be limited to, the hazards or potential hazards associated with work activities, and any hazardous chemical materials brought to on the site.

#### **6.5 FIRST AID AND CARDIO PULMONARY RESUSCITATION TRAINING**

The FOL/SSO will identify those individuals who have current first aid and cardiopulmonary resuscitation (CPR) training. At a minimum two people including the SSHO will be current in CPR/first aid. The names of all CPR/first aid-qualified workers will be posted on the site bulletin board and will be added to this APP when the project starts.

#### **6.6 BLOODBORNE PATHOGENS TRAINING**

Individuals on site who have first aid and CPR certification and who may provide emergency medical treatment shall have completed training in accordance with the Tetra Tech Bloodborne Pathogens Program and OSHA Bloodborne Pathogen Standard, 29 CFR 1910.1030. The Hepatitis B Vaccine Declination (mandatory) (in the event of accidental needle stick or other exposure to blood during first aid, etc.) will be one of the topics covered in the site orientation training in accordance with 29 CFR 1910.1030.

#### **6.7 TRAINING DOCUMENTATION**

Attachment I (Site Specific Training Documentation) documents the provision and content of the project-specific and associated training. Site personnel will be required to sign this form prior to commencement of site activities. This training documentation identifies personnel who, through record review and attendance of the site-specific training, are cleared for participation in site activities. This document shall be maintained at the site to identify and maintain an active list of trained and cleared site personnel.

## **6.8 PERIODIC SAFETY AND HEALTH TRAINING**

Tetra Tech supervisors and employees are required to maintain their training and certifications and participation in the medical surveillance program required for field work. This is accomplished throughout the year by attending classroom sessions, taking on-line instruction, participating in webinars, attending professional conferences and obtaining annual or bi-annual physical examinations. In addition to other corporate training Tetra Tech requires all employees to review and sign off on the Employee Handbook bi-annually which contains the Corporate Health and Safety Program.

## **6.9 EMERGENCY RESPONSE TRAINING**

Tetra Tech personnel who are involved in emergency response activities are required to attend and maintain their certifications.

## **7.0 SAFETY AND HEALTH INSPECTIONS**

It is Tetra Tech's internal policy that the job sites involving work for NAVFAC are subject to audits by corporate safety staff.

### **7.1 SPECIFIC ASSIGNMENT OF RESPONSIBILITY FOR A MINIMUM DAILY JOB SITE SAFETY AND HEALTH INSPECTION DURING PERIODS OF WORK ACTIVITY**

The Tetra Tech FOL/SSO will conduct safety and health inspections during this field effort to ensure safe work areas and compliance with the APP.

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

See Section 4.2.2.4.

#### **7.1.2 Inspection Frequency**

Daily site safety inspections shall be conducted by the FOL/SSO

#### **7.1.3 Documentation Procedures**

The FOL/SSO will record any deficiencies in the Field Log Book that is maintained onsite for the site practices.

#### **7.1.4 Deficiency Tracking System and Follow-up Procedures**

The items noted during field audits will be communicated to the Tetra Tech HSM who maintains 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 throughout Tetra Tech through training and electronic means as a method of continuous program improvement. The FOL/SSO will follow up on deficiencies to ensure that they are resolved.

#### **7.1.5 External Inspections/Certifications**

The Tetra Tech HSM or a designated representative may conduct an unannounced inspection during this project.

## **8.0 ACCIDENT REPORTING**

When an incident occurs, the FOL/SSO will verbally notify the PM. If the incident is an injury requiring more than first aid or property damages exceeding \$2,000 the PM will immediately notify the RPM.

### **8.1 EXPOSURE DATA**

If required by the RPM, the FOL/SSO will calculate exposure data on a monthly basis. Man-hours worked are obtained from hours charged to a project for payroll purposes.

### **8.2 ACCIDENT INVESTIGATIONS, REPORTS, AND LOGS**

Accidents or incidents, as well as near-miss events, are to be reported within 24 hours by either completing the written event report form or using the Tetra Tech web-based incident reporting process. Within five working days, a complete investigation report must be submitted to the RPM.

Tetra Tech employees have been educated that prompt and accurate reporting of any incidents they encounter is one of their personal health and safety responsibilities. On this project, the FOL/SSO are responsible for assuring that the incidents and serious near miss events are reported via the Tetra Tech TOTAL incident reporting system. The HSM is responsible for assuring that the incidents and serious near-miss events are adequately investigated. The HSM is also responsible for collecting, tracking, and trending incident data (e.g., recordable cases, employee hours worked, etc.). Accidents involving near misses, injuries, or illnesses must be immediately reported to the PM and the HSM, and documented on the Tetra Tech Incident Report form provided at the end of this section.

Hazardous work conditions or unsafe work practices will be corrected in a timely manner, both in the field and in the office. Upon discovery of an unsafe condition at a field site, the degree of hazard must be assessed. Action may range from complete shutdown of the operation to phased correction.

The Tetra Tech employees working on this project have "Stop Work" authority in the event that a potentially serious action or condition is observed. Tetra Tech will shut down a project during which life threatening, severe environmental impact, or significant equipment or property damage conditions may exist. Employees shall follow specific information for emergency evacuation and PPE usage as described in this APP.

### **8.3 IMMEDIATE NOTIFICATION OF MAJOR INCIDENTS**

Any occupational incidents meeting the definitions presented below that occur on this project will be immediately reported to the RPM as soon as possible, but not later than 24 hours from the time of the event. Incidents that must be reported include those that result in any of the following:

- Fatalities
- Permanent total disability
- Permanent partial disability
- Hospitalization of 3 or more people resulting from a single occurrence
- Property damage of \$200,000 or more

With consultation with the PHSO, the FOL will coordinate with the Tetra Tech PM in making any such notifications to the RPM.

### **8.4 INCIDENT REPORTING PROCEDURES**

Following the prescribed incident reporting procedure is necessary for documenting the information obtained at the time of the incident.

#### **8.4.1 TOTAL Incident Reporting System**

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

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

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

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

- Tools falling from overhead work near workers below
- Unexpected contact without damage to aboveground or below ground utilities
- Discovery of an unknown and potentially hazardous material or anomaly

Incidents, including near-miss incidents, involving Tetra Tech personnel shall be reported and investigated.

TOTAL is an intuitive system that guides users through the necessary steps to report an incident within 24 hours of its occurrence. TOTAL is a tool to better track incidents, analyze root causes, implement corrective action plans, and share lessons learned. TOTAL is maintained on the secure Tetra Tech Intranet site at <https://my.tetrattech.com/>.

#### **8.4.2 How to Access TOTAL to Report an Incident**

Once on the "My Tetrattech" web site, TOTAL can be found under the "Health and Safety" tab, by clicking on "Incident Reporting." Select "Report an Incident (TOTAL)" then, near the bottom of the screen, click on "Launch TOTAL Application." This connects the user directly to TOTAL. Next, click on "Enter new incident", and follow the steps as presented. The system was designed to be "fail safe" in that the user will not be able to skip any required information. TOTAL can also be accessed directly from the internet using the following web address: <http://totalhs.tetrattech.com/>.

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

If any Tetra Tech personnel are injured or develop an illness as a result of working onsite, and they are at a remote location where they cannot establish reliable internet connection with TOTAL to report an incident, then the employee will complete a hard-copy Tetra Tech "Incident Report Form."

Tetra Tech's Incident Reporting and Investigation Program requires that employees report all incidents as soon as possible, but within 24 hours. An initial report must be completed on TOTAL within that time frame.

Figure 8-1 is a print out of the screens found online in the TOTAL system. It can be used as a reference during the incident information gathering phase and prior to completing the form on line.

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## **9.0 PLANS (PROGRAMS, PROCEDURES) REQUIRED BY THE SAFETY MANUAL**

The follow sections further describe the plans and/or identify the location of the information.

### **9.1 LAYOUT PLANS**

This project will not erect any temporary facilities. The primary activities of the project will occur outside on or near the site. The sampling supplies and recordkeeping activity will supported using site vehicles. The layout of the Site is identified in the Facility Location Map included as Figure 2-1.

### **9.2 EMERGENCY RESPONSE PLANS**

The emergency response agencies listed in the APP are capable of providing the most effective response, and as such, are designated as the primary responders. These agencies are located within a reasonable distance from the area of site operations, which ensures adequate emergency response time. The RPM and the POC will be notified if these response agencies are contacted.

#### **9.2.1 Procedures and Tests**

In the event of an emergency situation such as fire or explosion, the FOL/SSO will activate an air or vehicle horn for approximately 15 seconds, indicating the initiation of evacuation procedures. The personnel in both restricted and non-restricted areas will evacuate and assemble near the support zone, or other safe area, as identified by the FOL/SSO.

Prior to start of work at any project site, the FOL/SSO will identify and mark the location of an evacuation assembly area for that project site. The location should be upwind of the site as determined by the wind direction. For efficient and safe site evacuation and assessment of the emergency situation, the FOL/SSO will have the authority to initiate proper action if outside services are required. Under no circumstances will incoming personnel or visitors be allowed to proceed into the area once the emergency signal has been given.

The FOL/SSO must establish that access for emergency equipment is provided and that the equipment that may cause combustion has been shut down once the alarm has been sounded. As soon as possible, and while the safety of the personnel is being confirmed, emergency agency notification will commence. The FOL/SSO will brief site personnel each day as to the location of the evacuation assembly area. Prior to the start of activities at the site, the FOL/SSO will establish safe egress routes from the site to the

evacuation assembly area. The FOL/SSO will prepare a drawing, or map, that diagrams these safe egress routes.

### **9.2.2 Spill Plans**

It is not anticipated that bulk quantities of potentially hazardous materials (greater than 55-gallons) may be handled during the site activities. However, if Tetra Tech field crewmembers discover a spill or leak they will employ the following measures.

- Take immediate actions to stop the leak or to control the spill.
- Notify the FOL/SSO immediately.
- Avoid contacting container contents.
- The potential hazards will be evaluated to determine the proper personal protection levels, methods, and equipment necessary for the cleanup.
- Spread the absorbent material in the area of the spill covering completely.
- If necessary, the spill area will be evacuated, isolated, and secured.

It is not anticipated that a spill will occur of such magnitude that the field crew cannot handle it. Should this occur, however, the FOL/SSO will notify appropriate emergency response agencies and the POC immediately.

### **9.2.3 Firefighting Plan**

Workers will only fight incipient stage fires using fire extinguisher available at the work site. Fire extinguishers are intended to fight only fires that have recently occurred and can be reasonably extinguished immediately. Workers will only attempt to fight a fire that can be reasonably extinguished within 30 seconds to 1 minute.

### **9.2.4 Posting of Emergency Telephone Numbers**

The list of emergency telephone numbers will be maintained at the telephone communications points in the site vehicle. See Table 9-1.

**TABLE 9-1  
EMERGENCY CONTACTS  
CRANE, INDIANA**

CONTACT	TELEPHONE
Base Emergency Numbers* (Fire Department, Base Security, Ambulance) <ul style="list-style-type: none"> <li>• If dialing from an on-base phone:</li> <li>• If dialing from cell or off-base phone:</li> </ul>	9-1-1 (812) 854-3300 or (812) 854-1333
Base Environmental Office	(812) 854-3114
Bedford Ambulance	(812) 279-6545
Bloomington Hospital (Bloomington, Indiana)	(812) 336-9515
Bedford Medical Center (Bedford, Indiana)	(812) 275-1200
Indiana Utility One Call	811
Poison Control Center	(800) 222-1222
National Response Center	(800) 424-8802
Navy RPM, Howard Hickey	(847) 688-2600 x 243
Base Contact, Thomas Brent	(812) 854-6160
Tetra Tech Project Manager, Ralph Basinski	(412) 921-8308
FOL/SSO, Chris Rumer	(412) 921-7105-office (240) 315-5439-cell
Tetra Tech Office, Pittsburgh	(412) 921-7090
CLEAN HSM, Matthew M. Soltis	(412) 921- 8912-office (412) 260-6681-cell
PSHO, James K. Laffey	(412) 921-8904-office (412) 370-6668-cell

\*NOTE: On-base extensions 3300 and 1333 are the primary emergency phone numbers. From NSA Crane phones, on Base extensions must be preceded by "854". Off-base numbers can only be reached by dialing "991" first. Emergencies involving site activities should subsequently be reported to the Environmental Protection Department (x -3114/1132/6160).

**9.2.5 Man Overboard/Abandon Ship**

Not applicable.

**9.2.6 Medical Support (Onsite/Offsite)**

Tetra Tech will ensure that a minimum of two people 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. Emergency medical assistance will be acquired.

Life-threatening medical emergencies will be handled by the calling 9-1-1. Others will be referred to the local hospitals. Maps to these facilities are provided in Figure 9-1.

Tetra Tech personnel are instructed to perform a drive-by of the nearest hospital prior to commencing site activities to ensure that it is accessible and available and that the most efficient routes (primary and alternate) are well mapped. If emergency medical assistance is not required, Tetra Tech personnel may contact WorkCare (occupational medicine provider) as detailed in the APP.

#### **9.2.6.1 Medical Data Sheet**

Each field team member, including visitors, entering the exclusion zone(s) shall be required to complete and submit a copy of the Medical Data Sheet (see Figure 9-2). This shall 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. If an exposure to hazardous materials has occurred, provide information on the chemical, physical, and toxicological properties of the subject chemical(s) to medical service personnel.

### **9.3 SUBSTANCE ABUSE POLICY**

The Tetra Tech Substance Abuse policy prohibits the unlawful manufacture, distribution, dispensation, possession, or use of alcohol; illegal drugs or intoxicants on any Company-owned or leased space, client facility, or work site. Use of these substances, regardless of whether it is determined that such use occurred during the work hours or at a company work location, or whether such use actually affected an employee's ability to perform his or her job, is a violation of this policy.

In order to enforce this policy, the Company may investigate potential violations and require personnel to undergo drug/alcohol screening, including urinalysis, blood tests or other appropriate tests. The Company may also conduct searches of all areas of the Company premises, including, but not limited to work areas, rest rooms, break areas, personal articles, employee's clothes, desks, work stations, lockers, and personal and Company-owned vehicles.

Violation of this policy or any of its provisions may result in disciplinary action up to and including termination of employment. Employees may be subject to discipline up to and including termination for

refusing to cooperate with searches or investigations, refusing to submit to screening, or failing to execute consent forms when required by supervisors.

Employees who are convicted of any criminal drug statute for a violation occurring in the workplace are required to notify their Human Resources Representative no later than five days after the conviction. It shall also be the responsibility of each employee who observes or has knowledge of another employee in a condition which impairs the employee to perform his or her job duties or who presents a hazard to the safety and welfare of others to promptly report that fact to his or her immediate supervisor.

#### **9.4 SITE SANITATION PLAN**

Housekeeping is an important issue at each work site. The work sites shall be kept as clean as possible during task operation, taking into consideration the nature of the work. The FOL/SSO is responsible to ensure that housekeeping occurs on a continuous basis.

Drinking water is provided for each site worker. An adequate supply of cool potable water is provided at the sites for both drinking and personal cleansing.

Public accessible toilets will be utilized while on site. The work conducted under this task order will be by mobile crews at normally unattended locations. Transportation is readily available to nearby toilet and/or washing facilities.

Showers, changing rooms, clothes drying facilities and food service are available near the site. Heavy duty plastic trash bags will be used to collect waste. Waste receptacles will be provided on site as needed.

#### **9.5 ACCESS AND HAUL ROAD PLAN**

Not applicable.

#### **9.6 RESPIRATORY PROTECTION PLAN**

Not applicable.

#### **9.7 HEALTH HAZARD CONTROL PLAN**

The health hazards associated with this project are physical, chemical and natural (animals, poisonous plants, insects, and snakes) hazards associated with soil boring, temporary well installation and sample

collecting. The APP describes the mitigation measures to reduce these hazards. Detailed task-specific hazards and controls are provided in the AHAs in Section 10.0.

**9.7.1 Chemical Exposure Potential**

The contaminant of concern (COC) associated with SWMU 16 is TCE. It was present in soils underlying the northern portion of B-146 and exterior to the building, to the north and northwest. The locations where TEC was detected are consistent with the primary location of TCE contamination in surface and subsurface soil, which is in the north end of the building. However, a human health risk assessment was completed at B-146 which indicated no significant risk is present in the air.

Table 9-2 below shows the maximum concentration of the TCE previously detected in soil in one location on the site in comparison to worst-case scenario concentrations potentially reached and current (OELs).

**TABLE 9-2  
COMPARISON OF VOLATILE ORGANIC CONCENTRATIONS  
AND PARTICULATE CONCENTRATIONS  
WITH CURRENT OCCUPATIONAL EXPOSURE LIMITS**

<b>Volatile Organics</b>			
Contaminant of Concern	Highest Concentration Previously Detected in Soil (0-2 feet)	Worst-Case Air Concentration That Could Be Encountered	Current ACGIH TLV
TCE	234 mg/kg	8,133.47 ppm	10 ppm TWA <sub>8</sub> 25 ppm STEL

Table Notes:  
 µg/L: milligram per liter  
 ppm: parts per million  
 TWA8: Time Weighted Average air concentration over an 8-hour work period that is not to be exceeded  
 STEL: Short Term Exposure Limit is a 15 minute TWA exposure that should not be exceeded at any time during a work day.

**9.7.2 COCs Properties and Exposure Signs/Symptoms**

TCE is a colorless liquid which is used as a solvent for cleaning metal parts. Breathing small amounts may cause headaches, lung irritation, dizziness, poor coordination, and difficulty concentrating. Breathing large amounts of TCE may cause impaired heart function, unconsciousness, and death. Breathing it for long periods may cause nerve, kidney, and liver damage. Drinking large amounts of TCE may cause nausea, liver damage, unconsciousness, impaired heart function, or death. Drinking small amounts of TCE for long periods may cause liver and kidney damage, impaired immune system function, and impaired fetal development in pregnant women, although the extent of some of these effects is not yet clear. Skin contact with TCE for short periods may cause skin rashes.

### **9.7.2.1 Inhalation, Ingestion, and Direct Contact**

The principle route that a worker could be exposed to these COC is inhalation, however based on the historical data and previous investigations at this worksite, although worker exposure to airborne concentrations of these COCs that could represent a health concern is considered to be possible, it is not likely.

Secondary pathways include ingestion, and a possibility for exposure via direct skin contact. The likelihood of worker exposure concerns through these two routes are also considered unlikely, provided that workers follow good personal hygiene and standard good sample collection/sample handling practices, and wear appropriate PPE as specified in this HASP. Examples of onsite practices that are to be observed that will protect workers from exposure via ingestion or skin contact include the following:

- No hand-to-mouth activities on site (eating, drinking, smoking, etc.)
- Washing hands upon leaving the work area and prior to performing any hand to mouth activities
- Wearing appropriate gloves whenever handling potentially-contaminated media, including soils, water, hand tools, and sample containers.

### **9.7.3 Air Testing and Monitoring**

As a precautionary measure to assure that exposures to chemicals of concern (COC) are avoided and documented, continuous monitoring will be conducted during the intrusive site activities using either a photoionization detector (PID) or a flame ionization detector (FID). For the identified contaminants the use of personal protective equipment and the observance of the other control requirements have been selected to minimize potential for personnel exposures to hazardous concentrations (known or unknown) of site contaminants.

#### **9.7.3.1 Instruments and Use**

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

- The SSO shall stop work and move site personnel upwind to a safe, unaffected area, where they will remain until further directed by the SSO.

- The SSO shall allow at least 5 minutes to pass so that the work area can ventilate, and will then re-approach the work area while continuously monitoring the BZ areas.

Only when BG levels are regained in BZ areas will work be permitted to resume.

If BG levels are not regained, the SSO will contact the HSM for additional direction.

#### **9.7.3.2 Instrument Action Levels**

The use of a PID or a FID will be acceptable, provided that the following action levels are observed:

- PID - 4 exposures of 5 minutes each in any one work day up to 129 PPM.
- FID - 4 exposures of 5 minutes each in any one work day up to 168 PPM.

#### **9.7.3.3 Instrument Maintenance and Calibration**

Operational checks and field calibration will be performed on the instruments each day prior to their use. Field calibration will be performed on instruments according to manufacturer's recommendations. These operational checks and calibration efforts will be performed in a manner that complies with the employees' health and safety training, the manufacturer's recommendations, and with the applicable manufacturer standard operating procedure. The calibration efforts must be documented. Figure 9-3 is provided for documenting these calibration efforts. This information may instead be recorded in a field operations logbook, provided that the information specified in Figure 9-3 is recorded. This required information includes the following:

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

#### **9.7.3.4 Documenting Instrument Readings**

The SSO is responsible for ensuring that air monitoring instruments are used in accordance with the specifications of this HASP and with manufacturer's specifications/recommendations. In addition, the SSO is also responsible for ensuring that the instrument use is documented. This requirement can be satisfied either by recording instrument readings on pre-printed sampling log sheets or in a field log book.

**This includes the requirement for documenting instrument readings that indicate no elevated readings above noted daily background levels (i.e., no-exposure readings).** At a minimum, the SSO must document the following information for each use of an air monitoring device:

- Date, time, and duration of the reading
- Site location where the reading was obtained
- Instrument used
- Personnel present at the area where the reading was noted
- Other conditions that are considered relevant to the SSO (such as weather conditions, possible instrument interferences, etc.)

## **9.8 HAZARD COMMUNICATION PROGRAM**

Site operations will be compliant with the provisions of the OSHA Hazard Communication 29 CFR 1910.1200(f) Standard. OSHA recently revised its Hazard Communication Standard to align with the United Nations' Global Harmonized System of Classification and Labeling of Chemicals. Two significant changes contained in the revised standard require the use of new labeling elements and a standardized format for Safety Data Sheets (SDS) formerly known as MSDSs. To help companies comply with the revised standard OSHA is phasing in the specific requirements over several years ending June 1, 2016. Site personnel are aware of these changes and will process this information accordingly.

### **9.8.1 MSDS/SDS**

Tetra Tech will provide MSDS/SDSs for chemicals brought onsite. The contents of these documents will be reviewed by the FOL/SSO with the user(s) of the chemical substances prior to any actual use or application of the substances onsite. The MSDS/SDSs will then be maintained in a central location (i.e., temporary office) and will be available for anyone to review upon request.

### **9.8.2 Chemical Inventory**

The FOL/SSO is responsible to develop and maintain an accurate chemical inventory list for the chemicals that will be used and stored at that workplace.

### **9.8.3 Container Labeling**

When a chemical is brought onsite, the FOL/SSO is responsible for its receipt will verify that the container is properly labeled with the following information:

- Name of the chemical substance
- Appropriate hazard warning
- Name and address of the chemical manufacturer

New OSHA labeling regulations, coming into effect in 2015, will require the following information on labels:

- Name, Address and Telephone Number
- Product Identifier
- Signal Word
- Hazard Statement
- Precautionary Statement(s)
- Pictograms

While these regulations are not currently mandatory some companies have already started to implement these changes.

#### **9.8.4 Training**

Any new chemicals brought onsite that may present new hazards may require additional training. The FOL/SSO will ensure that the appropriate training is conducted for the site personnel required to use the chemical.

#### **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**

It is necessary for the field team to be aware of the signs and symptoms and the measures appropriate to prevent heat and cold stress. While it is unlikely, if such conditions are encountered use the following information on heat and cold stress recognition, prevention and control.

Ambient temperature extremes (hot or cold working environments) may occur during performance of hazardous waste work depending on the project schedule. Work performed when ambient air temperatures are below 50 degrees Fahrenheit (°F) may result in varying levels of cold stress (frost nip, frost bite, and/or hypothermia) depending on environmental factors such as temperature, wind speed, and humidity; physiological factors such as metabolic rate and moisture content of the skin; and other factors such as work load and the protective clothing being worn. Work performed when ambient temperatures exceed 70°F may result in varying levels of heat stress (heat rash, heat cramps, heat exhaustion, and/or heat stroke) depending on factors similar to those presented above for cold stress.

In either case, these conditions can be debilitating and, when extreme, they can be fatal. An understanding of the importance in preventing heat/cold stress, coupled with the worker's awareness of the signs and symptoms of overexposure, can significantly reduce the potential for adverse health effects. If this hazard is present during site operations, each worker will be provided with information necessary to protect themselves, and site management will be instructed to permit frequent breaks in mild temperature rest areas having hot/cold fluids available for consumption. When site personnel are required to wear semi-permeable (Saranex, Tyvek) or impermeable protective clothing to perform their assigned tasks and ambient temperatures are 70°F or higher, biological monitoring may be performed and data compared to the most recent recommendations of the American Conference of Governmental Industrial Hygienists (ACGIH).

#### **9.14.1 Heat Related Disorders**

There are four heat related disorders to monitor while performing work onsite.

##### **9.14.1.1 Heat Rash**

Also known as prickly heat, this condition affects the skin. It occurs in situations where the skin remains wet most of the time. The sweat ducts become plugged and a skin rash soon appears.

#### 9.14.1.1.1 Signs and Symptoms

- Skin rash will appear on affected areas of the body.
- Tingling or prickling sensation will be felt on the affected areas.

#### **9.14.1.2 Heat Cramps**

Heat cramps are muscle pains, usually in the lower extremities, the abdomen, or both, that occur after profuse sweating with accompanying salt depletion. Heat cramps most often afflict people in good physical condition, who overwork in conditions of high temperature and humidity. Untreated, heat cramps may progress to heat exhaustion.

#### 9.14.1.2.1 Signs and Symptoms

- Cramps in the extremities and abdomen that begin suddenly during vigorous activity. Heat cramps can be mild with only slight abdominal cramping and tingling in the extremities, but more commonly present intense and incapacitating pain in the abdomen and extremities.
- Respiration rate will increase, decreasing after the pain subsides.
- Pulse rate will increase.
- Skin will be pale and moist.
- Body temperature will be normal.
- Generalized weakness will be noted as the pain subsides.
- Loss of consciousness and airway maintenance are seldom problems with this condition.

Treatment for heat cramps is aimed at eliminating the exposure and restoring the loss of salt and water.

#### **9.14.1.3 Heat Exhaustion**

Heat exhaustion is a more severe response to salt and water loss, as well as an initial disturbance in the body's heat-regulations system. Like heat cramps, heat exhaustion tends to occur in people working in hot environments. Heat exhaustion may progress to heat stroke. Treatment for heat exhaustion is similar in principle to that for heat cramps.

#### 9.14.1.3.1 Signs and Symptoms

- Heat exhaustion may be accompanied present by a headache, fatigue, dizziness, or nausea with occasional abdominal cramping.

- More severe cases of heat exhaustion may result in partial or complete temporary loss of respiration and circulation due to cerebral ischemia.
- Sweating will be profuse.
- Pulse rate will be rapid and weak.
- Respiration rate will be rapid and shallow.
- The skin will be pale and clammy.
- The body temperature will be normal or decreased.
- The person could be irritable and restless.

#### **9.14.1.4 Heat Stroke**

Heat stroke is caused by a severe disturbance in the body's heat-regulating system and is a profound emergency. The mortality rate ranges from 25 to 50 percent. It can also occur from having too much exposure to the sun or prolonged confinement in a hot atmosphere. Heat stroke comes on suddenly. As the sweating mechanism fails, the body temperature begins to rise precipitously, reaching 106°F (41°C) or higher within 10 to 15 minutes. If the situation is not corrected rapidly, the body cells -- especially the very vulnerable cells in the brain -- are literally cooked, and the central nervous system is irreversibly damaged. The treatment for heat stroke is aimed at maintaining vital functions and causing as rapid a decrease of body temperature as possible.

##### **9.14.1.4.1 Signs and Symptoms**

- The person's pulse will be strong and bounding.
- The skin will be hot, dry, and flushed.
- The worker may experience headache, dizziness, and dryness of mouth
- Seizures and coma can occur.
- Loss of consciousness and airway maintenance problems can occur.

#### **9.14.1.5 Controlling Heat Stress**

The following control measures are only guidelines for heat related emergencies. Actual training in emergency medical care or basic first aid is recommended. Employees will monitor one another for signs of heat stress. If indications of heat stress occur, the following corrective measures will be performed:

- Inform affected workers of the signs and symptoms of heat stress and encourage co-worker observations.

- Schedule tasks that are physically-demanding in early morning and late afternoon timeframes when heavy loads would be less of an issue.
- Notify the FOL/SSO who may perform biological monitoring to determine the extent of the heat related condition.
- The FOL/SSO may alter the work regime that will provide adequate rest periods for cooling down. This may require additional shifts of workers.
- The FOL/SSO may also recommend cooling devices such as vortex tubes or cooling vests be worn beneath protective garments.
- When conditions where heat related disorders may be experienced, the FOL/SSO through site-specific training and safety briefing will inform site personnel of the importance of adequate rest, acclimation, and proper diet in the prevention of heat stress.
- Provide adequate liquids to replace lost body fluids.
- Personnel must replace water and salt lost from sweating.
- Personnel must be encouraged to drink more than the amount required to satisfy thirst.
- Thirst satisfaction is not an accurate indicator of adequate salt and fluid replacement.
- Approximately 1 cup of cool water every 20 minutes is recommended.
- Replacement fluids can be commercial mixes such as Gatorade®.
- Move affected persons into a shaded cool rest area (below 77°F is best).
- Personnel shall remove impermeable protective garments during rest periods.
- Personnel shall not be assigned other tasks during rest periods.
- One of the following biological monitoring procedures may be utilized by the FOL/SSO to monitor heat stress concerns.

- Heart rate (HR) shall be measured by the pulse for 30 seconds as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 110 beats/minute.
- If the HR is higher, the next work period should be shortened by 10 minutes (or 33%), while the length of rest period stays the same.
- If the pulse rate is 100 beats/minute at the beginning of the next rest period, the following work cycle should be shortened by 33%.
- The length of the initial work period will be determined by using the table below.

**TABLE 9-3  
PERMISSIBLE HEAT EXPOSURE THRESHOLD LIMIT VALUES**

Work-Rest Regimen	Work Load		
	Light	Moderate	Heavy
Continuous	80.0 F	80.0 F	77.0 F
75% Work - 25% Rest, Each Hour	87.0 F	82.4 F	78.6 F
50% Work - 50% Rest, Each Hour	88.5 F	85.0 F	82.2 F
25% Work - 75% Rest, Each Hour	90.0 F	88.0 F	86.0 F

Body temperature shall be measured orally with a digital thermometer with disposable probe covers or an aural/temporal temperature sensor as early as possible in the resting period. Oral temperature (OT) at the beginning of the rest period should not exceed 99°F. If it does, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest period stays the same. However, if the oral temperature exceeds 99.7°F at the beginning of the next rest period, the following work cycle shall be further shortened by 33%. OT should be measured at the end of the rest period to make sure that it has dropped below 99°F. At no time shall work begin with the oral temperature above 99°F.

**NOTE:** External temperatures in excess of those stated above shall be regarded as inclement weather.

9.14.1.5.1 Temperature Extremes – Heat Stress Indication

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

- Watch for signs of heat stress/exhaustion, see Table 9-4.
- Provide fluid replacement.
- Provide adequate number of breaks within a cooler environment.

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

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

**TABLE 9-4**  
**HEAT STRAIN SYMPTOMS**

Stop work if any worker demonstrates any of the following:

Heart Rate	Sustained (several minutes) heart rate minus worker's age > than 180 beats per minute (bpm) measured at any time.
Body Core Temperature	> 101.3°F (38.5° C)
Recovery Heart Rate	> 110 bpm (measured 1 minute after peak work effort)
Other symptoms	Sudden and sever fatigue, nausea, dizziness, or headache

Individuals may be at greater risk of heat stress when:

- Profuse sweating is sustained over hours
- Weight loss over a shift is > 1.5% of beginning body weight
- 24-hour urinary sodium excretion is less than 50 nmoles

9.14.1.5.2 First Aid for Heat Stroke

Take the following steps to treat a worker with heat stroke:

- Call NSA Crane Emergency Dispatch Center and notify FOL/SSO.
- Move the affected individual to a cool shaded area.
- Cool the worker using methods such as:
  - Soaking their clothes with water.

- Spraying, sponging, or showering them with water.
- Fanning their body.

#### 9.14.1.5.3 First Aid for Heat Exhaustion

Treat victim suffering from heat exhaustion with the following:

- Have them rest in a cool, shaded or air-conditioned area.
- Have them drink plenty of water or other cool, nonalcoholic beverages.
- Have them take a cool shower, bath, or sponge bath.

#### 9.14.1.5.4 First Aid for Heat Cramps

Individuals with heat cramps should:

- Stop all activity, and sit in a cool place.
- Drink clear water, juice or a sports beverage.
- Do not return to strenuous work for a few hours after the cramps subside because further exertion may lead to heat exhaustion or heat stroke.
- Seek medical attention if any of the following apply:
  - The person has heart problems.
  - The person is on a low-sodium diet.
  - The cramps do not subside within one hour.

#### 9.14.1.5.5 First Aid for Heat Rash

Workers experiencing heat rash should:

- Try to work in a cooler, less humid environment when possible.
- Keep the affected area dry.
- Dusting powder may be used to increase comfort.

### 9.14.2 Cold Stress Related Disorders

Just as heat can present a problem for on-site personnel during certain activities, so can cold temperatures. Just as the heat related disorders are magnified by environmental conditions and the tasks to be completed, so are the cold related disorders. As above, the focus is on recognizing conditions contributing to cold related disorders and selecting the most appropriate control measure.

The ACGIH cold stress Threshold Limit Values (TLVs) are recommended to protect workers from the severest effects of cold stress (hypothermia) and cold injury and to describe exposures to cold working conditions under which it is believed that nearly all workers can be repeatedly exposed without adverse health effects. The TLV objective is to prevent the deep body temperature from falling below 36°degrees centigrade (°C) or (96.8°F) and to prevent cold injury to body extremities (deep body temperature is the core temperature of the body determined by conventional methods for rectal temperature measurements). For a single, occasional exposure to a cold environment, a drop in core temperature to no lower than 35°C (95°F) should be permitted. In addition to provisions for total body protection, the TLV objective is to protect all parts of the body with emphasis on hands, feet, and head from cold injury.

Fatal exposures to cold among workers have almost always resulted from accidental exposures involving failure to escape from low environmental air temperatures or from immersion in low temperature water. The single most important aspect of life-threatening hypothermia is the fall in the deep core temperature of the body. The clinical presentations of victims of hypothermia are shown in Table 9-5. Workers should be protected from exposure to cold so that the deep core temperature does not fall below 36°C (96.8°F); lower body temperatures will very likely result in reduced mental alertness, reduction in rational decision making, or loss of consciousness with the threat of fatal consequences.

**TABLE 9-5**  
**PROGRESSIVE CLINICAL PRESENTATIONS OF HYPOTHERMIA\***

Core Temperature		Clinical Signs
°C	°F	
37.6	99.6	"Normal" rectal temperature
37	98.6	"Normal" oral temperature
36	96.8	Metabolic rate increases in an attempt to compensate for heat loss
35	95.0	Maximum shivering
34	93.2	Victim conscious and responsive, with normal blood pressure
33	91.4	Severe hypothermia below this temperature
32	89.6	Consciousness clouded; blood pressure becomes difficult to obtain; pupils dilated but react to light; shivering ceases
31	87.8	
30	86.0	Progressive loss of consciousness; muscular rigidity increases; pulse and blood pressure difficult to obtain; respiratory rate decreases
29	84.2	
28	82.4	Ventricular fibrillation possible with myocardial irritability
27	80.6	Voluntary motion ceases; pupils nonreactive to light; deep tendon and superficial reflexes absent
26	78.8	Victim seldom conscious
25	77.0	Ventricular fibrillation may occur spontaneously
24	75.2	Pulmonary edema
22	71.6	Maximum risk of ventricular fibrillation
21	69.8	
20	68.0	Cardiac standstill
18	64.4	Lowest accidental hypothermia victim to recover
17	62.6	Isoelectric electroencephalogram
9	48.2	Lowest artificially cooled hypothermia patient to recover

\* Presentations approximately related to core temperature. Reprinted from the American Family Physician, published by the American Academy of Family Physicians.

#### 9.14.2.1 Signs and Symptoms

Pain in the extremities may be the first early warning of danger to cold stress. During exposure to cold, maximum severe shivering occurs when the body temperature has fallen to 3°C (95°F). This must be taken as a sign of danger and exposure to cold should be immediately terminated when severe shivering becomes evident. Useful physical or mental work is limited when severe shivering occurs.

#### 9.14.2.2 Control Measures

Since prolonged exposure to cold air or to immersion in cold water, at temperatures well above freezing can lead to dangerous hypothermia, whole body protection must be provided.

- Adequate insulating dry clothing to maintain core temperatures above 36°C (96.8°F) must be provided to workers if work is performed in air temperatures below 4°C (40°F).

- Wind chill cooling rate and the cooling power of air are critical factors. [Wind chill cooling rate is defined as heat loss from a body expressed in watts per meter squared which is a function of the air temperature and wind velocity upon the exposed body.]
- The higher the wind speed and the lower the temperature in the work area, the greater the insulation value of the protective clothing required.
- An equivalent chill temperature chart relating the actual dry bulb air temperature and the wind velocity is presented in Table 9-6.
- The equivalent chill temperature should be used when estimating the combined cooling effect of wind and low air temperatures on exposed skin or when determining clothing insulation requirements to maintain the deep body core temperature.
- Unless there are unusual or extenuating circumstances, cold injury to other than hands, feet, and head is not likely to occur without the development of the initial signs of hypothermia.
- Older workers or workers with circulatory problems require special precautionary protection against cold injury.
  - The use of extra insulating clothing and/or a reduction in the duration of the exposure period are among the special precautions which should be considered.
  - The precautionary actions to be taken will depend upon the physical condition of the worker and should be determined with the advice of a physician with knowledge of the cold stress factors and the medical condition of the worker.
- Acclimatization – With exposure the body does undergo changes that will permit it to adjust to the cold weather better.

**TABLE 9-6**  
**COOLING POWER OF WIND ON EXPOSED FLESH EXPRESSED AS EQUIVALENT TEMPERATURE**  
**(under calm conditions)\***

Estimated Wind Speed (in mph)	Actual Temperature Reading (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
Equivalent Temperature (°F)												
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect)	<b>LITTLE DANGER</b> In < hr with dry skin. Maximum danger of false sense of security				<b>INCREASING DANGER</b> Danger from freezing of exposed flesh within one minute.				<b>GREAT DANGER</b> Flesh may freeze within 30 seconds.			

Trench foot and immersion foot may occur at any point on this chart.

- Dehydration – Water and salt loss magnifies conditions associated with hypothermia. Warm, sweet nonalcoholic fluids should be employed for fluid replacement. Soup, non-caffeinated drinks including decaffeinated teas, coffees, etc. are suitable for this purpose.
- Diet – A balanced diet can provide the body with the necessary nutrients to aid in combating cold stress. Restrictive diets avoiding salts, carbohydrates, etc. may rob you of certain elements that you need. Caffeine and alcoholic drinks may increase the effects of a cold environment through the loss of water and salts.
- Engineering Controls such as wind shields/barriers may be used to control the potential effects of cold stress.
- Administrative controls such as worker rotation; work/warm regimens; required fluid intake; scheduling the work for warmer weather; assigning more workers to the task to complete it quicker.
- Overall physical condition should always be considered when combating cold stress.
  - Older persons and those on certain medications (blood pressure control) are vulnerable to cold environment and cold stress disorders.
- Environmental monitoring results will tell you if the conditions are such that cold related disorders can occur.
  - Biological monitoring will provide real time information as to the progression of the cold related disorders within your field crew.

#### **9.14.2.3 Monitoring**

- Core temperature
  - Ensure that it does not drop below 96.8°F
- Weight Loss
  - Monitoring weight loss may be indicative of water and salt loss through dehydration.
  - >2% changes in body weight are indicative of water loss.
- Visual observation of signs and symptoms of overexposure.

#### **9.14.2.4 Special Conditions - Evaluation and Control**

For exposed skin, continuous exposure should not be permitted when the air speed and temperature results in an equivalent chill temperature of -32°C (-25.6°F). Superficial or deep local tissue freezing will occur only at temperatures below -1°C (30.2°F) regardless of wind speed.

At air temperatures of 2°C (35.6°F) or less, it is imperative that workers who become immersed in water or whose clothing becomes wet be immediately provided a change of clothing and be treated for hypothermia.

TLVs recommended for properly clothed workers for periods of work at temperatures below freezing are shown in Table 9-7.

Special protection of the hands is required to maintain manual dexterity for the prevention of accidents:

- If fine work is to be performed with bare hands for more than 10-20 minutes in an environment below 16°C (60.8°F), special provisions should be established for keeping the workers' hands warm.
- For this purpose, warm air jets, radiant heaters (fuel burner or electric radiator), or contact warm plates may be utilized.

Metal handles of tools and control bars should be covered by thermal insulating material at temperatures below -1°C (30.2°F).

- If the air temperature falls below 16°C (60.8°F) for sedentary, 4°C (39.2°F) for light, -7°C (19.4°F) for moderate work and fine manual dexterity is not required, then gloves should be used by the workers.
- To prevent contact frostbite, the workers should wear anti-contact gloves.
- When cold surfaces below -7°C (19.4°F) are within reach, a warning should be given to each worker by the supervisor to prevent inadvertent contact by bare skin.
- If the air temperature is -17.5°C (0°F) or less, the hands should be protected by mittens.
- Machine controls and tools for use in cold conditions should be designed so that they can be handled without removing the mittens.

**TABLE 9-7**  
**THRESHOLD LIMIT VALUES WORK/WARM-UP SCHEDULE FOR FOUR-HOUR SHIFT\***

Air Temperature: Sunny Sky		No Noticeable Wind		5 mph Wind		10 mph Wind		15 mph Wind		20 mph Wind	
°C (approx)	°F (approx)	Max. Work Period	No. of Breaks								
-26° to -28°	-15° to -19°	(Norm Breaks)	1	(Norm Breaks)	1	75 min	2	55 min	3	40 min	4
-29° to -31°	-20° to -24°	(Norm Breaks)	1	75 min	2	55 min	3	40 min	4	30 min	5
-32° to -34°	-25° to -29°	75 min	2	55 min	3	40 min	4	30 min	5	Non-emergency work should cease	
-35° to -37°	-30° to -34°	55 min	3	40 min	2	30 min	5	Non-emergency work should cease			
-38° to -39°	-35° to -39°	40 min	4	30 min	1	Non-emergency work should cease					
-40° to -42°	-40° to -44°	30 min	5	Non-emergency work should cease							
-43° & below	-45° & below	Non-emergency work should cease									

**NOTES:**

- Schedule applies to moderate to heavy work activity with warm-up breaks of 10 minutes in a warm location. For Light-to-Moderate Work (limited physical movement): apply the schedule one step lower. For example, at 35°C (-30°F) with no noticeable wind (Step 4), a worker at a job with little physical movement should have a maximum work period of 40 minutes with 4 breaks in a 4-hour period (Step 5).
- The following is suggested as a guide for estimating wind velocity if accurate information is not available: 5 mph: light flag moves; 10 mph: light flag fully extended; 15 mph: raises newspaper sheet; 20 mph: blowing and drifting snow.
- If only the wind chill cooling rate is available, a rough rule of thumb for applying it rather than the temperature and wind velocity factors given above would be: (1) special warm-up breaks should be initiated at a wind chill cooling rate of about 1750 W/M<sup>2</sup>; (2) all non-emergency work should have ceased at or before a wind chill of 2250 W/m<sup>2</sup>. In general, the warm-up schedule provided above slightly under-compensates for the wind at the warmer temperatures, assuming acclimatization and clothing appropriate for winter work. On the other hand, the chart slightly over-compensates for the actual temperatures in the colder ranges, since windy conditions rarely prevail at extremely low temperatures.
- TLVs apply only for workers in dry clothing.

\*Adapted from Occupational Health & Safety Division, Saskatchewan Department of Labor.

- Provisions for additional total body protection are required if work is performed in an environment at or below 4°C (39.2°F). The workers should wear cold protective clothing appropriate for the level of cold and physical activity:
- If the air velocity at the job site is increased by wind, draft, or artificial ventilating equipment, the cooling effect of the wind should be reduced by shielding the work area or by wearing an easily removable windbreak garment.
- If only light work is involved and if the clothing on the worker may become wet on the job site, the outer layer of the clothing in use may be of a type impermeable to water.
- With more severe work under such conditions, the outer layer should be water repellent, and the outerwear should be changed as it becomes wetted.
- The outer garments should include provisions for easy ventilation in order to prevent wetting of inner layers of sweat.
- If work is done at normal temperatures or in a hot environment before entering the cold area, the employee should make sure that clothing is not wet as a consequence of sweating.
- If clothing is wet, the employee should change into dry clothes before entering the cold area.
- The workers should change socks and any removable felt insoles at regular daily intervals or use vapor barrier boots.
- The optimal frequency of change should be determined empirically and will vary individually and according to the type of shoe worn and how much the individual's feet sweat.
- If exposed areas of the body cannot be protected sufficiently to prevent sensation of excessive cold or frostbite, protective items should be supplied in auxiliary heated versions.
- If the available clothing does not give adequate protection to prevent hypothermia or frostbite, work should be modified or suspended until adequate clothing is made available or until weather conditions improve.

#### **9.14.2.5 Work - Warming Regimen**

If work is performed continuously in the cold at an equivalent chill temperature (ECT) or below  $-7^{\circ}\text{C}$  ( $19.4^{\circ}\text{F}$ ), heated warming shelters (tents, cabins, rest rooms, etc.) should be made available nearby. The workers should be encouraged to use these shelters at regular intervals, the frequency depending on the severity of the environmental exposure. The onset of heavy shivering, frostnip, the feeling of excessive fatigue, drowsiness, irritability, or euphoria are indications for immediate return to the shelter. When entering the heated shelter, the outer layer of clothing should be removed and the remainder of the clothing loosened to permit sweat evaporation or a change of dry work clothing provided. A change of dry work clothing should be provided as necessary to prevent workers from returning to work with wet clothing. Dehydration, or the loss of body fluids, occurs insidiously in the cold environment and may increase the susceptibility of the worker to cold injury due to a significant change in blood flow to the extremities. Warm sweet drinks and soups should be provided at the work site to provide caloric intake and fluid volume. The intake of coffee should be limited because of the diuretic and circulatory effects.

For work practices at or below  $-12^{\circ}\text{C}$  ( $10.4^{\circ}\text{F}$ ) ECT, the following should apply:

- The worker should be under constant protective observation (buddy system or supervision).
- The work rate should not be so high as to cause heavy sweating that will result in wet clothing; if heavy work must be done, rest periods should be taken in heated shelters and opportunity for changing into dry clothing should be provided.
- New employees should not be required to work full time in the cold during the first days of employment until they become accustomed to the working conditions and required protective clothing.
- The weight and bulkiness of clothing should be included in estimating the required work performance and weights to be lifted by the worker.
- The work should be arranged in such a way that sitting still or standing still for long periods is minimized.
- Unprotected metal chair seats should not be used.
- The worker should be protected from drafts to the greatest extent possible.

- The workers should be instructed in safety and health procedures.
  
- The training program should include as a minimum instruction in:
  - Proper rewarming procedures and appropriate first aid treatment.
  - Proper clothing practices.
  - Proper eating and drinking habits.
  - Recognition of impending frostbite.
  - Recognition of signs and symptoms of impending hypothermia or excessive cooling of the body even when shivering does not occur.
  - Safe work practices.

**Note:** This information has been adopted from the 2010-1011 "Threshold Limit Values for Chemical Substances and Physical Agents and Biological Indices" by the American Conference of Governmental Industrial Hygienists (ACGIH).

As conditions may vary, it will be at the discretion of the Field Operations Leader and the Site Safety Officer to temporarily suspend or terminate activities as conditions dictate. All site activities will be terminated in the advent of electrical storms, tornadoes, and other hazardous weather conditions.

#### **9.15 CRYSTALLINE SILICA MONITORING PLAN**

Not applicable.

#### **9.16 NIGHT OPERATIONS LIGHTING PLAN**

Not applicable.

#### **9.17 FIRE PREVENTION PLAN**

Combustible materials will be protected from heat, flames, and sparks by moving or covering them. Flammables will be kept in closed containers. Safety cans will be used, when required. The site workers have training on the use of portable fire extinguishers. Each site vehicle has at least a 5-lb dry chemical, ABC fire extinguisher.

#### **9.18 WILD LAND FIRE MANAGEMENT PLAN**

Not applicable.

**9.19 HAZARDOUS ENERGY CONTROL PLAN**

Not applicable.

**9.20 CRITICAL LIFT PLAN**

Not applicable.

**9.21 CONTINGENCY PLAN FOR SEVERE WEATHER**

The FOL/SSO 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 will be closed. All tools and supplies will be stored in a designated secure location.

**9.22 FLOAT PLAN**

Not applicable.

**9.23 SITE-SPECIFIC FALL PROTECTION & PREVENTION PLAN DEMOLITION PLAN**

Not applicable.

**9.24 DEMOLITION PLAN**

Not applicable.

**9.25 EXCAVATION/TRENCHING PLAN**

Not applicable.

**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**

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 at SWMU 16. It was developed using historical site background information regarding known or suspected chemical contaminants, information obtained on previous site visits, and knowledge of potential physical hazards that may be associated with the proposed work at the site.

This SSHP will be modified, as necessary, if new information becomes available, and changes will be made with the approval of the Tetra Tech FOL/SSO and the HSM. Requests for modifications to the SSHP should be directed to the FOL/SSO. The FOL/SSO will notify the HSM, who will then notify affected personnel of the changes.

**9.33.1 Site Description and Contamination Characterization**

SWMU 16 is approximately 16 acres in size and located in the north-central portion of NSA Crane. B-146 was an explosive fill and washout facility with a trichloroethene (TCE) degreaser present in the northern portion of the building. Discharges from the degreaser entered floor drains and discharged through clay

vitreous pipes to sumps located exterior to B-146, to the north and northwest. In 1995 the floor drains were sealed to prevent any further discharges to the sumps.

TCE and other chlorinated solvents that are present in groundwater and soil underlying SWMU 16 at elevated concentrations present significant risk for potential future groundwater users. The Navy has determined that interim measures must be conducted to address sources of TCE in soils exterior to B-146 to reduce continuing releases to groundwater.

### **9.33.2 Hazard/Risk Analysis**

The potential hazards associated with the site activities also include physical hazards and biological hazards. The potential for encountering various hazards will depend on the work being conducted, the location of that work, and the time of year. Specific hazards are discussed below. There are also environmental hazards associated with the physical location of the site (such as vehicular traffic) and weather conditions such as heat, noise, and flora and fauna contact. An 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 safety and hazard awareness on the job. 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 should be better prepared to perform work safely. The FOL/SSO will discuss the risks and precautions associated with each task identified in the Work Plan. Daily tailgate safety meetings are held at the start of each shift. Prior to the day's activity, the safety meeting discusses the potential chemical, physical, and environmental hazards that could be encountered, along with preventive safety measures. During a work day, if there are any changes or new conditions to be addressed, the FOL/SSO will update the AHA and ensure the workers review the amended AHA. Attendance is mandatory for the employees involved in the specific work identified by the AHA. Amended AHAs must be reviewed by the PHSM. If a change must be implemented immediately and the PHSM cannot be contacted, the FOL/SSO may implement the change and forward a copy of the change to the PHSM as soon as possible, leaving a voicemail phone message for the PHSM. The AHAs for this project are located in Section 10.0 of the APP. The FOL/SSO 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 FOL/SSO will forward any modified or new AHAs to the PHSM for review and approval.

### **9.33.2.1 Classic Safety**

In the site hazard assessment, preliminary site-specific hazards will be identified through the AHAs generated during development of the SSHP to determine the appropriate safety and health procedures needed to protect workers from the identified physical, biological, chemical, and natural hazards. This section is intended to provide information on some of the most commonly encountered hazards associated with the tasks anticipated at SWMU 16. This section will also reference some of the common safe work practices, PPE, and administrative controls generally used to mitigate potential hazards. Some of these hazards can be regarded as most severe or as more commonly-encountered in remedial activities such as these, and are further addressed in the following subsections.

#### **9.33.2.1.1 Slips, Trips, and Falls**

Planned activities associated with hazardous waste operations/construction operations will bring field personnel into areas where potential slip, trip, and fall hazards. These hazards may include the following:

- Uneven terrain due to excavation
- Plastic protective covers (e.g., associated with temporary decontamination pads)
- Work place clutter (e.g., tangled hoses)

Hazards of this nature and the potential consequences of injury from a slip, trip or fall are magnified 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
- Where necessary, using rope ladders and associated mechanisms to aid in ascent and descent
- Applying traction grit such as sand over slippery surfaces
- Maintaining good housekeeping practices.

The FOL/SSO will evaluate all walking/working surfaces to ensure these comply with the objectives stipulated in 29 CFR 1926 Subparts C – General Safety and Health; G – Signs, Signals and Barricades; Subpart L – Scaffolds; Subpart M – Fall Protection; and Subpart X – Stairways and Ladders. Requisite strength, heights and widths, and fall protection will be evaluated.

#### 9.33.2.1.2 Head and Back Injuries

At a minimum, workers will don safety shoes/boots and safety glasses prior to performing any or investigation activities. Hard hats will be worn when overhead hazards are present or heavy machinery (e.g., direct-push rigs, drill rigs) is in use. 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.

#### 9.33.2.1.3 Falling Objects

The items raised will be slowly lowered to the ground using a grapple and/or skip bucket. No personnel will work under equipment at any time. Also, the supervisor will verify that an adequate area is clear of personnel while the equipment is in operation.

#### 9.33.2.1.4 Heavy or Awkward Lifting

Hazards associated with heavy or awkward lifting become more predominant 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.
- Use proper lifting techniques.
- Plan your lifts
  - Place heavy items on shelves between the waist and chest and lighter items on higher shelves.
  - 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, i.e., 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 unsure that you can complete the lift without hurting yourself, either get a lifting aid (such as a dolly or mechanical hoist), get help from others, or both.
- Move as close to the load as possible, and ensure that good hand holds are obtainable. Wear gloves where necessary to improve hand holds.
- Lift with your legs not your back, bend your knees 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.
- Assess the area available to maneuver the lift.
  - Rearrange the area, remove clutter, and minimize the necessity of twisting and turning.
- Evaluate area of the lift.
  - 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.
- Your overall physical condition
  - Report previous injuries on your Medical Data Sheet.
  - DO NOT attempt to lift items that will put you at risk.
  - Break loads that you must carry into smaller manageable loads, and get assistance whenever significant lifting tasks are involved.

By evaluating applicable contributing factors, planning your lifts, and incorporating feasible control measures, the potential for injury associated with lifting can be minimized.

#### 9.33.2.1.5 Noise

Site activities will not expose site personnel to equipment or conditions exceeding occupational noise exposure limit action levels. However, if abnormal conditions exist and site personnel are exposed to

noise equal to or exceeding the OSHA 8-hour Time-Weighted Average sound level [85 decibels adjusted (dBA)] the FOL/SSO will ensure the following measures are employed:

- Effective use of hearing protection will be implemented by personnel working near the excessive noise sources.
- Site workers will evacuate to a safe area until the noise subsides
- Engineering and/or administrative controls may be used to reduce employee exposures to noise.

Workers on site will be informed 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.

### **9.33.2.2 Biological Hazards**

Biological hazards may be encountered on site. Workers should anticipate the increased likelihood of encountering these hazards. 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 FOL/SSO 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 such as cats, rats, or ground squirrels due to the possibility of a bite or parasitic infestation. Animal and bird droppings often contain mold, fungus, or bacteria that represent a significant respiratory hazard, including lung diseases and allergies. Personnel will not touch visual droppings.

#### **9.33.2.2.1 Insects**

Insects, including bees, wasps, hornets, spiders and ticks, may be present at this site making the chance of a bite or sting very 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 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.

#### 9.33.2.2.1.1 Spiders

Various spiders may be encountered at the SWMU 16; however, two spiders are potentially in the area that are poisonous – the Black Widow and Brown Recluse. The Black Widow spider varies from dark brown to black in color. Its body is 1/4 inch wide and overall size is 1-1/2 inches with legs extended. Only the female is poisonous and can be determined by the red or yellow hourglass marking the underside of the abdomen. The Brown Recluse has a characteristic fiddle-shaped pattern on their head region. The spider is golden brown with the fiddle being dark brown or black. This spider is not hairy and the fiddle pattern is often shiny. They are about 1/4 to 3/4 inch long. The victim will experience the following if a Black Widow or Brown Recluse spider has bitten them:

- The spider's bite will feel like a sharp pinprick or may not even be noticed.
- In 15 minutes or less, the person will feel a dull numbing pain in the bitten area.
- A faint red bite mark appears.
- Black Widow bites in the lower part of the body or legs will cause the victim will have muscle stiffness or cramps in their abdomen.
  - If the bite is on the upper body or arms, the victim will have muscle stiffness or cramps affecting the shoulders, back, or chest.
  - Additionally, the victim may experience headache, chills, fever, heavy sweating, dizziness, nausea, vomiting, and severe abdominal pain.
- Brown Recluse bite severity may vary.
  - The symptoms may vary from no harm to a very severe reaction.
  - Often there is a systemic reaction within 24-36 hours characterized by restlessness, fever, chills, nausea, weakness, and joint pain.
  - Where the bite occurs there is often tissue death and skin is sloughed off. In some severe cases, a wound may develop that lasts several months.
- First aid procedures for a Black Widow, Wolf Spider and Brown Recluse bites are as follows:

- Clean the bitten area with soap and water or rubbing alcohol.
- Do not apply a constricting band because the black widow venom's action is swift; there is little to be gained by trying to slow absorption with a constriction band.
- To relieve pain, place an ice pack over the bite.
- Keep the victim quiet and monitor breathing.
- Seek immediate medical attention.
- If possible, catch the spider to confirm its identity, even if the body is crushed.

### **9.33.3 Staff Organization, Qualifications and Responsibilities**

See Section 4.0 of the APP.

### **9.33.4 Training**

See Section 6.0 of this APP.

### **9.33.5 Personal Protective Equipment**

The levels of personal protection to be used for work tasks at the SWMU 16 site have been selected based on the nature of the planned work activities and on the known or anticipated hazards; types and concentrations of contaminants that may be encountered onsite; and contaminant properties, toxicity, exposure routes, and matrixes.

PPE is selected by the PHSO when writing the SSHP, and is confirmed through a rigorous review process by the Tetra Tech HSM. To assure proper PPE has been selected, both the physical and chemical hazards present at the job site are taken into account in both developing and reviewing safety-related documents.

The anticipated levels of protection selected for use by field personnel during site activities is the U.S. Environmental Protection Agency (EPA) Level D. If site conditions performed during site activities warrant a higher level of protection, the field personnel will withdraw from the site, immediately notify the Tetra Tech PHSO, and obtain further instructions.

PPE levels can be upgraded or downgraded based on a change in site conditions or investigation findings. When a significant change in site conditions occurs, hazards will be reassessed.

PPE has been selected based on the results of task-specific hazard assessments. Through the completion of employee training (e.g., introductory 40-hour hazardous waste training, annual refresher

training, etc.), Tetra Tech employees have been informed of the proper selection, use, and care of PPE items provided to them. After PPE is provided to an employee, the responsibility for using and caring for it appropriately is the responsibility of that employee. The FOL/SSO is responsible for assuring that these responsibilities are fulfilled through daily observations and work area inspections at the sites. The FOL/SSO is also responsible for assuring that appropriate and adequate supplies of PPE are maintained such that they are readily available for issuance/replacement and in a clean and sanitary manner and location. The site personnel will use the procedures presented in the AHAs to obtain optimum performance from PPE.

The levels of personal protection to be used for work tasks have been selected based on the nature of the planned work activities and on the known or anticipated hazards. Specific PPE selected for this project is listed, by task, in the AHAs located in Section 10.0 of the APP. The PPE minimum is as follows:

- Safety glasses with side shields when there is a possibility of splashing liquids
- Hard hat if near overhead hazards
- Shirts and long pants
- Water resistant shoe/boots with slip-resistant soles
- Tyvek<sup>®</sup> coverall type suits if a chance of soiling clothing

#### **9.33.6 Medical Surveillance**

Personnel performing onsite work that will result in exposure to contaminant-related health and safety hazards shall be enrolled in a medical surveillance program that complies with OSHA standards 29 CFR 1910.120 (f) and 29 CFR 1926.65(f). Site personnel will have had a physical examination, conducted by a board certified occupational medicine physician, which meets the requirements of Tetra Tech's medical surveillance program. Certification of medical surveillance program participation is appended to the SSHP. The certification shall include:

- Employee name
- Date of last examination
- Name of examining physician(s).

The required written occupational physician's opinion shall be made available upon request to the USACE Contracting Officers Representative. The medical records shall be maintained in accordance with 29 CFR 1910.1020. Attachment I contains the certification of participation in a medical surveillance program.

### **9.33.7 Exposure Monitoring/Air Sampling Program**

A photo ionization detector (PID) will be utilized to monitor vapors if the need arises (see Section 9.7). The FOL/SSO will notify the PHSO immediately if this occurs.

### **9.33.8 Heat and Cold Stress**

See Section 9.14 of this APP.

### **9.33.9 Standard Operating Procedures, Engineering Controls and Work Practices**

In addition to the task-specific work practices and restrictions identified in the AHAs found in Section 10.0 of the APP, the following general safe work practices are to be followed when conducting work on-site.

- Personnel engaged in onsite activities will practice the "buddy system" to ensure the safety of personnel involved in this operation.
- Buddies should maintain visual contact with each other and with other on-site team members by remaining in close proximity to assist each other in case of emergency.
- Eating, drinking, chewing gum or tobacco, taking medication, or smoking in contaminated or potentially contaminated areas or where the possibility for the transfer of contamination exists is prohibited.
- Wash hands and face thoroughly upon leaving a contaminated or suspected contaminated area.
- The use of waterless hand cleaning products is acceptable if followed by actual hand-washing as soon as practicable upon exiting the site.
- Avoid contact with potentially contaminated substances including puddles, pools, mud, or other such areas.
- Avoid, kneeling on the ground or leaning or sitting on equipment.
- Plan and mark entrance, exit, and emergency evacuation routes.
- Rehearse unfamiliar operations prior to implementation.

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

#### **9.33.9.1 Material Handling Procedures**

Tetra Tech personnel should notify supervisors or designated safety representatives of pre-existing medical conditions that may be aggravated or re-injured by lifting activities, such that the Tetra Tech may evaluate safe operational procedures with regard to the required task.

- Proper lifting techniques (use of knees and not back) must be used when lifting any object:
- Plan storage and staging to minimize lifting or carrying distances.
- Split heavy loads into smaller loads.
- Use mechanical lifting aids whenever possible.
- Have someone assist with the lift especially for heavy (>40 lbs.) or awkward loads.
  - If site personnel are not capable of lifting 40 lbs., seek assistance from a team member to split the load.
- Make sure the path of travel is clear prior to the lift.

#### **9.33.9.2 Drum/Container/Tank Handling**

During the execution of the contract, the only type of generated waste materials will be in the form of used PPE.

#### **9.33.9.3 Comprehensive AHA of Treatment Technologies**

See Section 10.0 of the APP.

### **9.33.10 Site Control Measures**

This section outlines the means to delineate work zones and use these work zones in conjunction with decontamination procedures to prevent the spread of contaminants into previously unaffected areas.

#### **9.33.10.1 Control Zones**

It is anticipated that a three-zone approach will be used during work at this site. This approach will be comprised of an exclusion zone, a contamination reduction zone, and a support zone. It is also anticipated that this approach will control access to site work areas, restricting access by the general public, minimizing the potential for the spread of contaminants, and protecting individuals who are not cleared to enter work areas. Site personnel entering the exclusion zone and contamination reduction corridor will log-in and log-out with the FOL/SSO on a daily basis. This information will be kept in the FOL/SSO project log book.

#### **9.33.10.2 Exclusion Zone**

The exclusion zone will be considered those areas of active operations plus an established safety zone depending on the task. The following represent the exclusion zone boundaries for the following identified tasks:

- Sub slab sampling and air monitoring– 10 feet from point of sampling

Exclusion zones will be delineated using barrier tape, cones and/or drive poles, and postings to inform and direct facility site personnel and visitors, as necessary.

A pre-startup site visit will be conducted to identify proposed subsurface investigation locations, conduct utility clearances, and provide notices concerning scheduled activities.

#### **9.33.10.3 Contamination Reduction Zone**

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

#### **9.33.10.4 Support Zone**

The support zone for this project will include a staging area where site vehicles will be parked, equipment will be unloaded, and where food and drink containers will be maintained. The support zones will be established at areas of the site away from potential exposure to site contaminants during normal working conditions or foreseeable emergencies.

#### **9.33.10.5 Site Visitors**

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

- Personnel invited to observe or participate in operations by Tetra Tech
- Regulatory personnel (i.e., DoD, USEPA, OSHA)
- Authorized Navy Personnel
- Other authorized visitors

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

Site visitors will be escorted and restricted from approaching any work areas where they could potentially be exposed to hazardous chemicals. If a visitor has authorization from the client and from the Tetra Tech Project Manager to approach our work areas, the FOL must assure that the visitor first provides documentation indicating that he/she/they have successfully completed the necessary OSHA introductory training, receive site-specific training from the SSO, and that they have been physically cleared to work on hazardous waste sites.

#### **9.33.10.6 Site Security**

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

### **9.33.10.7 Communication**

As personnel will be working in proximity to one another during field activities, a supported means of communication between field crew members will not be necessary. External communication will be accomplished by using cellular telephones at approved locations. External communication will primarily be used for the purpose of resource and emergency resource communications. Prior to the commencement of activities at the site, it is strongly recommended that cell signal strength be checked in the work areas and the relevant project phone numbers are programmed on site worker cell phones. The FOL will determine and arrange for telephone communication procedures. Workers should enter the emergency and important phone numbers from Table 9-1 in Section 9.2.4 into their cell phones prior to beginning work.

### **9.33.11 Personal Hygiene and Decontamination**

This section provides decontamination procedures and guidelines for developing site and activity specific decontamination procedures.

#### **9.33.11.1 Responsibilities**

The PHSO shall ensure that decontamination measures are adequately addressed in the Site Specific Health and Safety Plan. The FOL/SSO is responsible for establishing a decontamination area. The FOL/SSO also ensures that adequate decontamination procedures are followed to prevent contamination of individuals or the environment beyond the exclusion zone. The PM will ensure that sufficient information has been provided to the PHSO to prepare adequate decontamination procedures for inclusion in the SSHP.

#### **9.33.11.2 Decontamination**

Decontamination involves physically removing contaminants and/or converting them chemically into harmless substances. Decontamination, proper PPE donning procedures, and safety zones minimize the chance of cross-contamination from protective clothing to wearer, equipment to personnel, and one area to another.

The decontamination will consist of a soap/water wash and rinse for outer protective equipment (e.g., boots, gloves, PVC splash suits, etc.). This function will take place at an area adjacent to the drilling operations bordering the support zone.

This decontamination procedure will consist of:

- Equipment drop
- Soap/water wash and rinse of outer gloves and outer boots, as applicable
- Soap/water wash and rinse of the outer splash suit, as applicable
- Wash hands and face, leave contamination reduction zone

The FOL/SSO will determine the organization and materials used. Factors that are considered include: the extent and type of hazard expected, meteorological conditions, topography, levels of protection selected, and availability of equipment and supplies.

#### **9.33.11.3 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 sit or lean against anything in a contaminated area.
- Waste containers should be checked for incompatible materials.
- Do not set sampling equipment directly on contaminated areas.
- Use the proper tools to safely conduct the job.

#### **9.33.11.4 Decontamination Guidance**

Personnel decontamination will consist of a soap/water wash and rinse for outer protective equipment (boots, gloves, splash suits, etc.). This function will take place at an area adjacent to the site activities.

Decontamination procedures will be reviewed with site personnel prior to entering the EZ. Each person will be given precise instructions and be acquainted with the procedure for moving through the decontamination line. Progress through the decontamination line will be deliberate, organized to minimize hazard contamination for personal.

#### **9.33.11.5 Closure of the Decontamination Line**

When the decontamination line is no longer needed, it will be closed down by site personnel. The disposable items used during the operation will be double-bagged and contained onsite, or removed to an approved off-site disposal facility. Decontamination and rinse solutions may be discarded onsite if approved by regulatory agencies. If not, they will be removed to an approved disposal facility. Reusable clothing should be dried and prepared for future use. If gross contamination had occurred, additional

decontamination or disposal of these items may be required. Cloth items must be bagged and removed from the site for final cleaning or disposal. Wash tubs, pails, containers, etc., must be thoroughly washed, rinsed, and dried before removal from the site.

#### **9.33.12 Sampling Equipment Decontamination**

Sampling equipment will be decontaminated as stated per the requirements in the Work Plan. MSDS/SDS for any decontamination solutions (such as Alconox<sup>®</sup>, methanol, isopropanol, hexane, etc.) will be obtained and used to determine proper handling / disposal methods and protective measures (PPE, first-aid, etc.). The sampling equipment used will require a complete decontamination between locations and prior to removal from the site.

The equipment used in the exclusion zone will require a complete decontamination between locations and prior to removal from the site.

The FOL/SSO will be responsible for evaluating equipment arriving onsite and that which is to leave the site. Equipment will only be authorized access or exit with this authorization.

Evaluation will consist of a visual inspection to ensure that visible contamination has been effectively removed.

#### **9.33.13 Emergency Equipment and First Aid**

The following emergency equipment will be strategically placed and maintained onsite:

- 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 available and ready for use.
  - The location of each first aid kit shall be clearly marked, and kits shall be protected from the weather and maintained clean.
  - The kit must contain all the items listed in Figure 9-4, Requirements for Basic Unit Packages (from Section 3 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 shall be replaced as they are used.
- Eye wash units (or bottles of disposable eyewash solution) are maintained during sampling activities due to the small quantities of corrosive preservatives and well construction activities due to the caustic nature of the cement/grout products.
  - These units are acceptable due to extremely small quantity of the corrosives.

- These will be used as adjunct support until access to a fixed unit or the medical provider at Union Hospital.
- These units will be maintained in a clean location and inspected each week.
- Fire extinguishers will be maintained onsite and shall be immediately available for use in the event of an emergency. 2A:10BC for general support activities.
- If fuel will be transferred from portable fuel cans, they will be Underwriters Laboratory (UL) approved safety cans properly labeled.
  - If greater than 25 gallons is stored onsite a 5A:60BC fire extinguisher will be mounted within 50 feet of the fueling location.
- Fire extinguishers will be inspected monthly to ensure:
  - Sufficient charge
  - No physical damage
  - Tamper indicators are in place
  - Inspection tag documents inspection
- Site personnel will be trained in the use of the fire extinguisher as part of site specific training.

#### **9.33.13.1 First Aid**

Tetra Tech personnel will perform rescue operations from emergency situations and may provide initial medical support for injury/illnesses requiring only "Basic First-Aid and Cardio Pulmonary Resuscitation (CPR)" level support, and only within the limits of training obtained by site personnel.

Basic First-Aid is considered treatment that can be rendered by a trained first aid provider at the injury location. Medical attention above First-Aid level support will require assistance from the designated emergency response agencies. At least two Tetra Tech site personnel will be trained to this level while working onsite.

### **9.33.14 Emergency Response and Contingency Procedures**

In the event of an emergency during onsite work, the primary response action by onsite personnel will be to safely evacuate, assemble at an area unaffected by the emergency, and notify the POC. Workers who are ill or who have suffered a non-serious injury may be transported by site personnel to nearby medical facilities, provided that such transport does not aggravate or further endanger the welfare of the injured/ill person.

Site personnel will record any pertinent information regarding allergies to medications or other special conditions will be provided to medical services personnel. This information is listed on Medical Data Sheets which will be filed onsite.

The local NSA Crane emergency response agencies listed in this plan are capable of providing the most effective response, and as such, will be designated as the primary responders. These agencies are located within a reasonable distance from the area of site operations, which ensures adequate emergency response time. The POC will be notified if these response agencies are contacted.

Tetra Tech personnel will provide insipient emergency prevention activities such as:

- Initial (e.g., non-structural) fire-fighting support (fire extinguisher) and prevention
- Initial spill control and containment measures and prevention
- Evacuate personnel from emergency situations
- Initial medical support for injury/illness requiring only first-aid level support

#### **9.33.14.1 Pre-Emergency Planning**

Based on the nature of the planned activities, emergencies resulting primarily from physical hazards could be encountered. To minimize or eliminate the potential for these emergency situations, pre-emergency planning activities will include the following:

- Coordinating with the NSA Crane Emergency Response personnel prior to the commencement of work to ensure that Tetra Tech emergency action activities are compatible with existing emergency response procedures.
- Establishing and maintaining information at the project staging area (support zone) for easy access in the event of an emergency.

- Creating and maintaining documents onsite that can be important in the event of an emergency situation, including:
  - A Chemical Inventory of hazardous chemicals onsite
  - Corresponding MSDS/SDS.
  - Completed Medical Data Sheets (Figure 9-2) for onsite personnel.
  - A log book identifying personnel onsite each day.
  - Hospital route maps with directions.
  - Emergency Notification - phone numbers.

In the event of an onsite emergency, the FOL/SSO will be responsible for the following tasks:

- Determining that an emergency situation exists, initiating a site evacuation, accounting for onsite personnel at the assembly area, and determining if/when return to work conditions resume.
- With assistance from the FOL/SSO, educating site workers to the hazards and control measures associated with planned activities at the site, and providing early recognition and prevention.
- With assistance from the FOL/SSO, periodically performing practice drills to ensure site workers are familiar with incidental response measures.

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

In the event of an emergency situation the FOL/SSO will serve as the Incident Commander until the NSA Crane emergency services arrive on site. Other site personnel will provide support and follow direction from the Incident Commander.

#### **9.33.14.3 Criteria and Procedures for Emergency Recognition and Site Evacuation**

Emergency situations may be encountered during site activities.

##### **9.33.14.3.1 Emergency Recognition**

Emergency situations that may be encountered during site activities will generally be recognized by visual observation. Visual observation will also play a role in detecting potential exposure events to chemical hazards. To adequately recognize chemical exposures, site personnel must have an awareness of signs and symptoms of exposure associated with the principle site contaminant of concern. Tasks to be performed at the site, potential hazards associated with those tasks and the recommended control methods are discussed in this SSHP and APP. Additionally, early recognition of hazards will be

supported by daily site surveys to eliminate any situation predisposed to an emergency. The FOL/SSO will be responsible for performing and documenting surveys of work areas prior to initiating site operations and periodically while operations are being conducted. Site personnel are responsible for reporting perceived hazardous situations.

The above actions will provide early recognition for potential emergency situations, and allow Tetra Tech to instigate necessary control measures. However, if the FOL/SSO determine that control measures are not sufficient to eliminate the hazard, Tetra Tech will withdraw from the site and notify the appropriate response agencies.

#### 9.33.14.3.2 Site Evacuation

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

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

Evacuation procedures will be discussed during the pre-activities training session, prior to the initiation of project tasks. Evacuation routes from the site and safe places of refuge are dependent upon the location at which work is being performed and the circumstances under which an evacuation is required. Additionally, site location and meteorological conditions (i.e., wind speed and direction) may dictate evacuation routes. As a result, assembly points will be selected and communicated to the workers relative to the site location where work is being performed. Evacuation should always take place in an upwind direction from the site.

#### 9.33.14.3.3 Emergency Alarm Systems

Tetra Tech personnel will be working in close proximity to each other at SWMU 16. As a result, hand signals, two-way radio communications, voice commands, and line of site communication will be sufficient to alert site personnel of an emergency. When project tasks are performed simultaneously on different sites, vehicle horns will be used to communicate emergency situations. If an emergency warranting evacuation occurs, the following procedures are to be initiated:

Initiate the evacuation via radio communications, hand signals, voice commands, line of site communication, or vehicle horns. The following signals shall be utilized when communication via vehicle horn is necessary:

<b>HELP</b>	three short blasts	(. . .)
<b>EVACUATION</b>	three long blasts	(- - -)

- Report to the designated refuge point.
- Once non-essential personnel are evacuated, appropriate response procedures will be enacted to control the situation.
- Describe to the FOL/SSO (who will serve as the initial Incident Coordinator) pertinent incident details.

#### **9.33.14.4 Decontamination and Medical Treatment of Injured Personnel**

Based on the nature of the planned activities and on the nature and extent of contamination that may be encountered during these activities, the need for any specific personal decontamination activities in an emergency medical situation is highly unlikely. In the unlikely instance that such efforts become necessary, decontamination procedures will be performed only if doing so does not further jeopardize the welfare of the involved personnel. Decontamination will be postponed if the incident warrants immediate evacuation. As soon as possible and prior to transportation to a medical center the contaminated site worker will be:

- Washed and rinsed
- Contaminated clothing removed and disposed of as hazardous waste
- First aid treatment rendered

#### **9.33.14.5 Route Maps and Phone Numbers for Emergency Responders**

The closest hospitals are in Bloomington and Bedford. The Emergency Departments are open 24 hours a day, 365 days a year, and are equipped to treat all illnesses and injuries, whether minor, serious or life threatening. The routes to these hospitals are in Figure 9-1.

Prior to initiating field activities, personnel will be thoroughly briefed on the emergency procedures to be followed in the event of an accident. Table 9-1 in Section 9.2.4 provides a list of emergency contacts and telephone numbers. This table must be posted where it is readily available to site personnel.

#### **9.33.14.6 Criteria for Alerting Local Community Responders**

In the event of an emergency situation, the FOL/SSO will enact emergency notification procedures to secure additional assistance in the following manner:

- Dial emergency numbers listed in Table 9-1 and report the incident.
- Give the emergency operator the:
  - Location of the emergency
  - Type of emergency
  - Number of injured
  - A brief description of the incident.
- Stay on the phone and follow the instructions given by the operator.
- The operator will then notify and dispatch the proper emergency response agencies.

#### **9.34 BLASTING SAFETY PLAN**

Not applicable.

#### **9.35 DIVING PLAN**

Not applicable.

#### **9.36 CONFINED SPACE PROGRAM**

It is not anticipated, under the proposed scope of work, that confined space and permit-required confined space activities will be conducted. Therefore, personnel under the provisions of this APP are not allowed, under any circumstances, to enter confined spaces. If confined space operations are to be performed as part of the scope of work, detailed procedures and training requirements will have to be addressed.

## **10.0 RISK MANAGEMENT PROCESSES**

Work conducted in support of this project will be performed using the Activity Hazard Analysis (AHA) process to guide and direct field crews on a task by task basis. It is the FOL/SSO's responsibility to review the AHAs with the task participants as part of a pre-task tailgate briefing session.

Daily safety meetings will be conducted during site work and the task-specific AHA(s) will be reviewed prior to initiating any field activities. This effort will ensure that site-specific considerations and changing conditions are incorporated into the planning effort. Use of the APP will provide the line of communication for reviewing task-specific hazards and protective measures associated with each operation. The APP will be used as the primary reference for selecting levels of protection and control measures.

The FOL/SSO is responsible for making the parties aware of the contents and requirements of the APP. Any problems encountered with the protective measures required will be documented and brought to the attention of the FOL/SSO.

As an ongoing quality assurance effort, the FOL/SSO will review operations to ensure the AHAs adequately address potential hazards for the tasks being conducted. Where deficient, they will be corrected and that information shared with the field personnel. Amended AHAs will be forwarded to the PHSO for inclusion in future APPs for similar activities. See Table 10-1.

TABLE 10-1  
ACTIVITY HAZARD ANALYSIS

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<b>Activity/Work Task:</b> Mobilization - Demobilization		<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>				<b>L</b>	
<b>Project Location:</b> SWMU 16, NSA Crane		<b>Risk Assessment Code (RAC) Matrix</b>					
<b>Contract Number:</b> W912BU-13-D-0010		Severity	Probability				
<b>Date Prepared:</b> June 10, 2013			Frequent	Likely	Occasional	Seldom	Unlikely
<b>Prepared by:</b> J. Laffey, CESCO		Catastrophic	E	E	H	H	M
		Critical	E	H	H	M	L
<b>Reviewed by:</b> C. Snyder, CESCO		Marginal	H	M	M	L	L
		Negligible	M	L	L	L	L
Notes: (Field Notes, Review Comments, etc.)		Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above)					
		"Probability" is the likelihood to cause an incident, near miss, or accident and Identified as: Frequent, Likely, Occasional, Seldom, or Unlikely.					<b>RAC Chart</b>
		"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible					E= Extremely High
		Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.					H= High
						M= Moderate	
						L= Low	
ACTIVITY / PHASE	HAZARDS	CONTROLS				RAC	
<ul style="list-style-type: none"> <li>Assembling equipment and supplies</li> <li>Performing initial/exit inspections of the intended work areas</li> <li>Arranging for utilities, site access, notifying appropriate client contacts</li> <li>Performing equipment inspections of vehicles and equipment arriving/preparing to leave the site</li> <li>Conducting site</li> </ul>	1. Heavy equipment	1. Conduct heavy initial site acceptance inspection prior to performing any work at this site. 2. Use the equipment inspection checklist for excavation equipment in Attachment II. Once the equipment passes inspection the AHA for Excavation Area Safety will be followed.				L	
	2. Minor cuts, abrasions or contusions	1. Wear cut-resistant gloves when handling items with sharp or rough edges.				L	
	3. Heavy lifting (muscle strains and pulls)	1. Practice safe lifting techniques. Use mechanical lifting devices such as a dolly whenever possible 2. Ensure clear path of travel. 3. Have a good grasp on object. Perform "test lift" to gauge ability to safely make the lift. 4. Lift with legs not back. Obtain help when needed to lift large, bulky, or heavy items).				L	
	4. Vehicular traffic when moving large equipment to the support area	1. Designate and mark vehicle and equipment staging areas. Inform the site personnel of heavy equipment areas and of their responsibility to stay clear of moving vehicles. 2. In high traffic areas, wear a high-visibility vest, shirt or jacket.				L	

ACTIVITY / PHASE	HAZARDS	CONTROLS	RAC
geographic surveys	5. Slips, Trips, Falls	<ol style="list-style-type: none"> <li>1. Watch for tree branches, roots, weeds, limbs and other ground hazards.</li> <li>2. Wear appropriate foot protection to prevent slips and trips.</li> <li>3. Use caution when working on uneven and wet ground surfaces.</li> </ol>	L
	6. Intermittent high noise levels	<ol style="list-style-type: none"> <li>1. Site personnel are to wear hearing protection if noise levels are such that they must raise their voice in order to communicate with someone who is within arm's reach (approximately 2 feet) of them.</li> <li>2. FOL/SSO is responsible for determining and designating when hearing protection is required.</li> <li>3. Hearing protection is to consist of either ear muffs or plugs that have a noise reduction rating (NRR) of at least 25 decibels (dB).</li> </ol>	L
	7. Inclement weather	<ol style="list-style-type: none"> <li>1. The FOL/SSO will temporarily suspend outside activities in the event of electrical storms or high winds.</li> <li>2. It is preferred that supported systems such as lightning detection devices or emergency weather broadcasts are employed.</li> <li>3. However, when this is not possible field personnel should use the 30/30 Rule: <ul style="list-style-type: none"> <li>• "If there is less than 30 seconds between thunder and lightning go inside and stay inside for at least 30 minutes after the last thunder."</li> </ul> </li> </ol>	L
	8. Implement Site Specific Hazard Communication Program	<ol style="list-style-type: none"> <li>1. Complete the chemical inventory for the project.</li> <li>2. Procure MSDS/SDSs for chemicals used exclusively on this project.</li> <li>3. Label containers used onsite for hazardous materials.</li> <li>4. Identification of any additional hazard communication training requirements.</li> </ol>	L
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS	
Hand tools (dollies, hand carts, hand knives, etc.)	Visual inspection prior to use by user.	Review of AHA during pre-task tailgate safety briefing with the intended task participants.	
<b>Personal Protective Equipment</b> <b>Minimum:</b> Safety toe boots, safety glasses. Optional items: Hardhat, hearing protection. <b>HTRW:</b> None anticipated for this task.	Initial PPE inspection performed by FOL/SSO. Ongoing (prior to each use) inspections responsibilities of PPE users.	PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees' 40 hour HAZWOPER training, which is to be verified by the FOL/SSO through initial training documentation and review prior to permitting personnel to participate in any onsite activities, and will be confirmed by visual observations of worker activities.	

I have read and understand this AHA:

<b>Name (Printed)</b>	<b>Signature</b>	<b>Date</b>

ACTIVITY HAZARD ANALYSIS

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<b>Activity/Work Task:</b> Sub slab Sampling and air monitoring	<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>					L
<b>Project Location:</b> SWMU 16, NSA Crane	<b>Risk Assessment Code (RAC) Matrix</b>					
<b>Contract Number:</b> W912BU-13-D-0010	<b>Severity</b>	<b>Probability</b>				
<b>Date Prepared:</b> June 10, 2013		<b>Frequent</b>	<b>Likely</b>	<b>Occasional</b>	<b>Seldom</b>	<b>Unlikely</b>
<b>Prepared by:</b> J. Laffey, CESCO	<b>Catastrophic</b>	E	E	H	H	M
	<b>Critical</b>	E	H	H	M	L
<b>Reviewed by:</b> C. Snyder, CESCO	<b>Marginal</b>	H	M	M	L	L
	<b>Negligible</b>	M	L	L	L	L
<b>Notes:</b> (Field Notes, Review Comments, etc.)	Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above)					
	"Probability" is the likelihood to cause an incident, near miss, or accident and Identified as: Frequent, Likely, Occasional, Seldom, or Unlikely.				<b>RAC Chart</b>	
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible				E= Extremely High	
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.				H= High	
					M= Moderate	
					L= Low	

JOB STEPS	HAZARDS	CONTROLS	RAC
Site Set Up	1. Minor cuts abrasions handling equipment and tools	1. Wear cut-resistant gloves when handling items with sharp or rough edges.	L
	2. Slips, Trips, Falls	1. Identify and clear intended work areas of potential tripping hazards. 2. Practice good housekeeping to keep the site clear of obstructions, materials, equipment and other tripping hazards. 3. Ensure that work boots have adequately-aggressive sole design. 4. Use caution when working on uneven and wet ground.	L
Underground utility clearance	1. Electrical Shock, explosion, flooding	1. Prior to drilling, locate utilities in the area. (See Tetra Tech Utility Locating and Excavation Clearance Standard Operating Procedure) 2. Electrical (main line, outside lighting, well power line, etc.) 3. Gas (propane gas lines usually lead from above ground tank), 4. Water, sewage, sprinkler system and storm water will be located by employing the cable/magnetometer, hand auger and fiberglass tile probe in an effort to avoid energized systems.	L
Locate sampling location which is the lowest floor with contact with the underlying	1. Slips, Trips, and Falls	1. Ensure adequate ventilation 2. Determine if shelving and other objects stored in the room is secure. 3. Keep the work area clean and well lit. 4. Keep bystanders, children, and visitors away while operating a power tool as distractions can cause you to lose control.	L

**ACTIVITY HAZARD ANALYSIS**  
**Sub Slab Sampling and air monitoring**

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JOB STEPS	HAZARDS	CONTROLS	RAC
soil, in the center of the structure.		5. Make sure the extension cord is in good condition and heavy enough to carry the current the drill will draw. (Check manufactures instructions.) 6. An undersized cord will cause a drop in line voltage resulting in loss of power and overheating.	
Power cutting machine to saw cut and remove concrete cores and chips.  Hand tools and or drills may also be used for this activity.	1. Crushing, pinching, cutting, amputation and bruising hazards as well as caught-on and struck-by and flying debris hazards are associated with powered handheld equipment usage.	1. Qualified and trained personnel workers shall inspect, test, and determine safe operating condition of all power tools prior to use. 2. Continued, periodic inspections shall be performed assure safe operating condition and proper maintenance. 3. Utilize a power cutting machine in a well-ventilated environment. 4. Prior to use, the operator shall check the blade for damage and ensure that the blade arbor is the proper size and is seated securely on the hub. 5. Use the proper blade for the material being cut. 6. The operator shall use the correct size blade guard for the blade in use. 7. Intentional forcing may cause the blade to shatter. 8. The operator shall make shallow cuts with the blade to avoid overheating. 9. Overheating may cause the blade to fail resulting in serious injury. 10. The operator shall lift blade from cutting surface before stopping the machine.	L
Coring with portable electric drill	1. Flying objects ,electrical shock and twisting injuries	1. Read and following the manufacturer's operating instructions. 2. Keep hair, clothing, and gloves away from moving parts. 3. Wear safety glasses when operating with portable electric drill. 4. Disconnect the drill from the electrical supply when installing bits. 5. Clamp stock so it will not move during the drilling operation. 6. Select the correct bit for the finish and material being drilled. 7. Make sure the bit is securely tightened in the drill chuck. 8. Before drilling, turn on, to see if the bit is centered and running true. 9. Align the bit with the desired hole location before turning the drill on. 10. Hold the drill firmly with both hands while drilling. 11. Move the bit up and down several times while drilling to remove cuttings and reduce overheating in the bit. 12. Do not allow the cord to become wrapped around the drill when working. 13. If the electrical cord becomes frayed or starts to separate from the drill housing, replace it immediately! 14. Remove the bit from the drill as soon as the work is completed. 15. Be extremely careful if the bit should hang or get caught the drill will twist in the operators hands causing a sprain or bruised fingers. 16. Always remove the key from the chuck before drilling. 17. To prevent seizing, reduce the feed pressure when the drill bit is about to come through the material.	L

**ACTIVITY HAZARD ANALYSIS**  
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JOB STEPS	HAZARDS	CONTROLS	RAC
Using a portable generator	1. Fire, exhaust fumes/ carbon monoxide poisoning	1. Read and follow the manufacturer's operating instructions before running generator 2. Never use a generator inside an enclosed areas. 3. Only operate a generator outdoors, away from open windows, vents, or doors. 4. Place a battery-powered carbon monoxide detector in work area. 5. Because gasoline vapors are extremely flammable, allow the generator engine to cool at least 2 minutes before refueling. 6. Never operate the generator near combustible materials. 7. Make sure extension cords are of the grounded type and are rated for the application. 8. Always uncoil extension cords and lay them in flat open locations. 9. Only a qualified electrician should connect the generator directly into a buildings electrical system using a power transfer switch. 10. Protect generator exposure to any moisture including rain and snow.	L
Air Monitoring	1. Exposure to contaminants of concern particularly TCE	1. Wear surgeon's gloves when handling potentially-contaminated media and samples. 2. Avoid contact with potentially-contaminated media to the extent possible. 3. Follow good decontamination and practice good personal hygiene (hands and face washing) when exiting work area, 4. Hand-to-mouth activities in the work area will be prohibited (eating, drinking, smoking, etc.). 5. Periodically screen sample with PID or FID. 6. If readings above daily-established background levels (BGLs) are noted in borehole, monitor worker breathing zone (BZ) areas. 7. If readings in worker BZ areas exceed: <ul style="list-style-type: none"> <li>◦ PID 4 exposures of 5 minutes each in any one work day up to 129 PPM.</li> <li>◦ FID 4 exposures of 5 minutes each in any one work day up to 168 PPM.</li> </ul> 8. After at least 5 minutes, SSO will approach from upwind direction screening BZ areas. Work may resume when readings in the BZ return to BGLs.	L
EQUIPMENT TO BE USED		INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Coring drill with bits, stainless steel Summa® canisters Safety Equipment: Portable eye wash bottle <b>Monitoring Instruments:</b> PID or FID		Visual inspection prior to use by user. Calibration of PID/FID prior to use by user.	Review of AHA during pre-task tailgate safety briefing with all intended task participants.
<b>Personal Protective Equipment: <u>Minimum:</u></b> Safety toe boots, safety glasses, face shield, and hearing protection, cotton or leather work		Initial PPE inspection performed by SSO. Ongoing (prior to each use) inspections responsibilities of PPE	PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees' 40 hour HAZWOPER training, which is to

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
gloves. <u>Optional items:</u> Hardhat, <b>HTRW:</b> TCE	users.	be verified by the SSO through initial training documentation and review prior to permitting personnel to participate in any onsite activities, and will be confirmed by visual observations of worker activities.

I have read and understand this AHA:

Name (Printed)	Signature	Date

ACTIVITY HAZARD ANALYSIS

Revision 0  
August 2013

<b>Activity/Work Task:</b> Decontamination		<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>				<b>L</b>	
<b>Project Location:</b> SWMU 16, NSA Crane		<b>Risk Assessment Code (RAC) Matrix</b>					
<b>Contract Number:</b> W912BU-13-D-0010		<b>Severity</b>	<b>Probability</b>				
<b>Date Prepared:</b> June 10, 2013			<b>Frequent</b>	<b>Likely</b>	<b>Occasional</b>	<b>Seldom</b>	<b>Unlikely</b>
<b>Prepared by:</b> J. Laffey, CESCO		<b>Catastrophic</b>	E	E	H	H	M
		<b>Critical</b>	E	H	H	M	L
<b>Reviewed by:</b> C. Snyder, CESCO		<b>Marginal</b>	H	M	M	L	L
		<b>Negligible</b>	M	L	L	L	L
Notes: (Field Notes, Review Comments, etc.)		Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above)					
		"Probability" is the likelihood to cause an incident, near miss, or accident and Identified as: Frequent, Likely, Occasional, Seldom, or Unlikely.					<b>RAC Chart</b>
		"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible					
		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>JOB STEPS</b>	<b>HAZARDS</b>	<b>CONTROLS</b>				<b>RAC</b>	
Personal and sampling equipment decontamination	1. Slips, Trips, Falls	1. Clear intended decon area location of ground hazards. 2. Practice good housekeeping to keep the site clear of obstructions, materials, equipment and other tripping hazards. 3. Wear appropriate foot protection to prevent slips and trips. 4. Use caution when working on uneven and wet surfaces				L	
	2. Exposure to contaminated media	1. Follow good decontamination practices (work from top down and outside in). 2. Nitrile gloves are to be the last item of PPE removed. 3. Wash hands and face following personal decontamination and prior to performing any hand-to-mouth activity. 4. Wash and rinse reusable items, dispose of non-reusable items 5. Place in a secure location to dry				L	
<b>EQUIPMENT</b>	<b>INSPECTION</b>	<b>TRAINING</b>					
Hand tools (hand brushes, water sprayers, etc.)	Visual inspection prior to use by user. Check wooden handles for cracks or splinters	None required.					
Personal Protective Equipment: <b>Minimum:</b> Nitrile gloves, safety toe boots, safety glasses <b>Optional items:</b> Hardhat, hearing protection..	Initial PPE inspection performed by FOL/SSO. Ongoing (prior to each use) inspections responsibilities of PPE users.	Initial site specific H&S training to cover review of the APP. Daily tail-gate and pre-task briefings to review appropriate AHAs and other relevant topics. OSHA 40 hour HAZWOPER training, plus appropriate 8-hour annual refresher training for the task participants. Supervisors must have completed					

EQUIPMENT	INSPECTION	TRAINING
<u>HTRW</u> : TCE		additional 8 hours of HAZWOPER training. Also Review of AHA during tailgate safety briefing with the intended task participants.  PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees' 40 hour HAZWOPER training, which is to be verified by the FOL/SSO through initial training documentation and review prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities.

I have read and understand this AHA:

Name (Printed)	Signature	Date

**ACTIVITY HAZARD ANALYSIS**

Revision 0  
August 2013

<b>Activity/Work Task:</b> Investigative Derived Waste (IDW) Management	<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>					<b>L</b>
<b>Project Location:</b> SWMU 16, NSA Crane	<b>Risk Assessment Code (RAC) Matrix</b>					
<b>Contract Number:</b> W912BU-13-D-0010	<b>Severity</b>	<b>Probability</b>				
<b>Date Prepared:</b>		<b>Frequent</b>	<b>Likely</b>	<b>Occasional</b>	<b>Seldom</b>	<b>Unlikely</b>
<b>Prepared by:</b> J. Laffey, CESCO	<b>Catastrophic</b>	E	E	H	H	M
	<b>Critical</b>	E	H	H	M	L
<b>Reviewed by:</b> C. Snyder, CESCO	<b>Marginal</b>	H	M	M	L	L
	<b>Negligible</b>	M	L	L	L	L
<b>Notes:</b> (Field Notes, Review Comments, etc.)	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				E= Extremely High	
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each <b>"Hazard"</b> on AHA. Annotate the overall highest RAC at the top of AHA.				H= High	
				M= Moderate		
				L= Low		

JOB STEPS	HAZARDS	CONTROLS	RAC
Filling, moving 55-gallon drums of IDW	1. Heavy lifting	1. Practice safe lifting techniques (use mechanical lifting devices such as a dolly whenever possible, 2. Ensure clear path of travel 3. Have a good grasp on object 4. Perform "test lift" to gauge ability to safely make the lift 5. Lift with legs not back 6. Obtain help when needed to lift large, bulky, or heavy items.	L
	2. Struck by/pinches compressions	1. Exercise caution when handling drums. 2. Position drums so that there is adequate room between them for placement and repositioning.	L
	3. Falling objects (drums)	1. Do not stack drums on top of each other. 2. Do not place more than 4 drums to a pallet. 3. Leave at least 4 feet of clearance between pallets for clear access.	L
	4. Slips, Trips, Falls	1. Maintain good housekeeping in IDW storage areas, keeping it clear of loose debris and other potential tripping hazards. 2. Wear appropriate foot protection to prevent slips and trips. 3. Use caution when working on uneven and wet ground surfaces.	L
	5. Foot hazards	1. Safety toe foot protection will be required for IDW container handling activities.	L
	5. Minor contusions, abrasions, cuts	1. Wear cut-resistant gloves when handling items with sharp or rough edges.	L

EQUIPMENT	INSPECTION	TRAINING
Hand tools (drum dollies, wrenches, etc.)	Visual inspection prior to use by user. Check wooden handles for cracks or splinters.	All personnel participating in this activity must be current with HAZWOPER training requirements.
<p><b>Personal Protective Equipment: <u>Minimum:</u></b>                      Safety toe boots, safety glasses <b><u>Optional items:</u></b>                      Hardhat, cotton or leather work gloves. If contact with IDW is likely, wear chemical-resistant coveralls (e.g., surgeon's nitrile gloves under leather/cotton work gloves</p> <p><b><u>HTRW:</u></b> metals in groundwater</p>	Initial PPE inspection performed by FOL/SSO. Ongoing (prior to each use) inspections responsibilities of PPE users.	<p>Initial site specific H&amp;S training to cover review of the APP. Daily tail-gate and pre-task briefings to review appropriate AHAs and other relevant topics.</p> <p>PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees 40 hour HAZWOPER training, which is to be verified by the FOL/SSO through initial training documentation and review prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities.</p>

I have read and understand this AHA:

Name (Printed)	Signature	Date

ACTIVITY HAZARD ANALYSIS

Revision 0  
August 2013

<b>Activity/Work Task:</b> Excavation Area Safety and Confirmatory Sampling	Overall Risk Assessment Code (RAC) (Use highest code)					L
<b>Project Location:</b> SWMU 16, NSA Crane	<b>Risk Assessment Code (RAC) Matrix</b>					
<b>Date Prepared:</b> June 10, 2013	<b>Severity</b>	<b>Probability</b>				
		Frequent	Likely	Occasional	Seldom	Unlikely
<b>Prepared by:</b> J. Laffey, CESCO	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
<b>Reviewed by:</b> J. Carothers PhD	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L
<b>Notes:</b> (Field Notes, Review Comments, etc.)	Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above)					
	"Probability" is the likelihood to cause an incident, near miss, or accident and Identified as: Frequent, Likely, Occasional, Seldom, or Unlikely.				<b>RAC Chart</b>	
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible				E= Extremely High Risk	
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.				H= High Risk	
					M= Moderate Risk	
					L= Low Risk	

JOB STEPS	HAZARDS	CONTROLS	RAC
Site Set Up	1. Inclement weather	1. If electrical storms or inclement weather are in the area, as determined through local forecasting or weather alerts issued, the SSO will suspend outside activities. 2. The 30-30 rule shall be applied, which is "if a time interval of 30 seconds or less is between lightning and its thunder, go inside (building/vehicle) and stay inside for at least 30 minutes." 3. If no additional lightning and/or thunder is noted within this 30 minutes, work may resume at the SSO direction. 4. Personnel will be directed to seek suitable shelter that will provide adequate protection from the elements.	L
	2. Lack of Communication	1. A standardized set of hand signals should be used by the operator and signal person. 2. Operators should always know exactly where all ground based workers are located 3. Wear of high visibility vests to help the operator locate you quickly. 4. All equipment has blind spots, always assume you are in the blind spot. 5. Equipment should have a backup warning alarm that can be heard by all nearby workers. 6. If available, use two-way radios to communicate with equipment operators.	L
	3. Falls, crushing injuries, broken bones	1. Never jump onto or off the equipment. 2. Operators should always use the three-point contact rule when climbing onto or off heavy equipment. 3. The three-point rule means having both feet and one hand, or one foot and both hands in contact with the ladder access at all times. 4. Always keep away from suspended loads.	L

**ACTIVITY HAZARD ANALYSIS**  
**Excavation Area Safety and Confirmatory Sampling**

Revision 0  
 August 2013

JOB STEPS	HAZARDS	CONTROLS	RAC
		5. Never take naps, breaks, or lunch around heavy equipment. You never know what might happen.	
	6. Slips, Trips, Falls	1. Clear intended work areas and walking paths of roots, weeds, limbs and other ground hazards. 2. Practice good housekeeping to keep the site clear of obstructions, materials, equipment and other tripping hazards. 3. Ensure that work boots have adequately-aggressive sole design. 4. Use caution when working on uneven and wet ground.	L
	4. Insect bites.	1. Use insect repellants. 2. Products containing DEET should be applied to exposed skin. 3. Products containing Permethrin should be applied to clothing only. 4. Follow manufacturer's recommendations.	L
Walking in area around excavation.	1. Slips trips and falls walking in general area of intended excavation.	1. Review general terrain and identified surface conditions. 2. Look for ruts, larges rocks and uneven terrain. 3. If focus on instrument distracts excessively from attention to terrain, have an assistant help spot hazards in area. 4. If lifting or pushing scanning instruments of heavier weights, get help with movements to avoid strains.	M
	2. Falling into trench or trench collapses	1. At no time will Tetra Tech employees be permitted to enter unprotected area of the excavation. 2. Watch for barricaded areas that indicate the swing radius of the excavator to prevent being struck by or crushed between injuries at the rear of the equipment. 3. Only authorized persons will be allowed within 6 feet of the excavation. 4. At a minimum, barricades shall be erected six feet from the edge of the trench. 5. Anyone working within the six foot boundary and not entering the trench must be protected with fall protection. 6. Methods of fall protection can be: <ul style="list-style-type: none"> <li>• OSHA approved railing or fall restraint by tethering workers so that they cannot approach the trench close enough to fall in.</li> <li>• Attachment must withstand four times the anticipated load a person would exert walking to the trench or leaning to see in.</li> </ul>	M
	3. Noise	1. If noise levels are such that you have to raise you voice to be heard by someone within two feet of you (>85dB), wear hearing protection (plugs or muffs) with an NRR of at least 25 dB. 2. Because this site is situated in a residential area operating hours may be restricted by local ordinances.	M

**ACTIVITY HAZARD ANALYSIS**  
**Excavation Area Safety and Confirmatory Sampling**

Revision 0  
 August 2013

JOB STEPS	HAZARDS	CONTROLS	RAC
Confirmatory Soil Sampling	1. Chemical contamination – TCE	1. Avoid contact with potentially-contaminated media to the extent possible. 2. Wear long sleeve shirts and pants. 3. Wear tyvek if chance of soiling clothing 4. Wear surgeon's gloves when handling potentially-contaminated media and samples. 5. Follow good decontamination and practice good personal hygiene (hands and face washing) when exiting work area. 6. Hand-to-mouth activities in the work area will be prohibited (eating, drinking, smoking, etc.). 7. Exposure via dermal contact and ingestion represent some limited concern during this task. 8. Area wetting will be used if visible dust generation is observed.	M
	2. Muscle strains, tendon or ligament sprains, back or other soft-tissue injuries, bruises, abrasions, cuts, foot or eye injuries,	1. Using a shovel can be physically demanding depending on the conditions of the soil and the physical capabilities of the operator. 2. Only personnel who are confident that they can physically perform this activity will do so.	L
		3. Ensure that the shovel/hand auger tool is properly maintained. 4. Avoid injury by stopping if strong resistance is encountered (such as if impassable rocky conditions are encountered). 5. Secure assistance when needed. 6. Wear appropriate PPE (work gloves, safety toe shoes, and safety impact eye protection)	L
<b>EQUIPMENT</b>	<b>INSPECTION</b>	<b>TRAINING</b>	
Heavy equipment; Hand shovel, sampling equipment <b>Safety Equipment:</b> Portable eye wash bottle <b>Monitoring Instruments:</b> none	Visual inspection prior to use by user.	Training/experience in proper sample collection, handling and chain of custody requirements. Read manufacturer's instructions for monitoring instruments.	
<b>Personal Protective Equipment:</b> <b>Minimum:</b> nitrile surgeon's type gloves, safety toe boots, safety glasses. Wear Tyvek if chance of soiling clothing.	Initial PPE inspection performed by SSO. Ongoing (prior to each use) inspections responsibilities of PPE users.	OSHA 40 hour HAZWOPER training, plus appropriate 8-hour annual refresher training for the task participants. Supervisors must have completed additional 8 hours of HAZWOPER training. ALSO: Review of AHA during pre-task tailgate safety briefing with the intended task participants.  PPE training in proper use, care, storage, and limitations. It is anticipated	

EQUIPMENT	INSPECTION	TRAINING
		that this has been covered in employees' 40 hour HAZWOPER training, which is to be verified by the SSO through initial training documentation and review prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities.

I have read and understand this AHA:

Name (Printed)	Signature	Date

## 11.0 REFERENCES, MATERIALS AND DOCUMENTATION

United States Army Corps of Engineers (USACE). 15 December 2008. Engineer Manual (EM) 385-1-1, Safety and Health Requirements Manual.

Available online at: <http://www.usace.army.mil/inet/usace-docs/eng-manuals/em385-1-1/entire.pdf>

The Tetra Tech FOL/SSO shall ensure the following materials/documents are taken to the project site and used when required. The following documentation is to be posted or maintained at the site for quick reference purposes. For this project, the items so noted below will be maintained in the Tetra Tech work vehicle.

**Chemical Inventory Listing (posted)** - This list represents the chemicals brought onsite, including decontamination solutions, sample preservations, fuel, etc. This list will be maintained in the Tetra Tech Work Trailer.

**Material Safety Data Sheets/Safety Data Sheets (MSDS/SDSs) (maintained)** - The MSDS/SDSs will be maintained in the Tetra Tech Work trailer. These documents should match the listings on the chemical inventory list for substances used onsite. It is acceptable to have these documents within a central folder and the chemical inventory as the table of contents.

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

**The OSHA Job Safety & Health Protection Poster (posted)** - This poster, as directed by 29 CFR 1903.2 (a)(1), should be conspicuously posted in places where notices to employees are normally posted. Each FOL/SSO shall ensure that this poster is not defaced, altered, or covered by other material. See Attachment II.

**Site Clearance (maintained)** - This list is found within the training section of the APP. This list identifies site personnel, dates of training (including site-specific training), and medical surveillance. The list indicates not only clearance but also status. If personnel do not meet these requirements, they do not enter the site while site personnel are engaged in activities. This list will be maintained in a vehicle onsite during operations.

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

**Medical Data Sheets/Cards (maintained)** - Medical Data Sheets will be completed by onsite personnel and filed in the Tetra Tech Work Trailer. The Medical Data Sheet will accompany any injury or illness requiring medical attention to the medical facility. A copy of this sheet or a wallet card will be given to personnel to carry at times.

**Hearing Conservation Standard (29 CFR 1910.95) (posted)** - This standard will be posted any time hearing protection or other noise abatement procedures are used.

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

## FIGURES

FIGURE 2-1

FACILITY LOCATION MAP

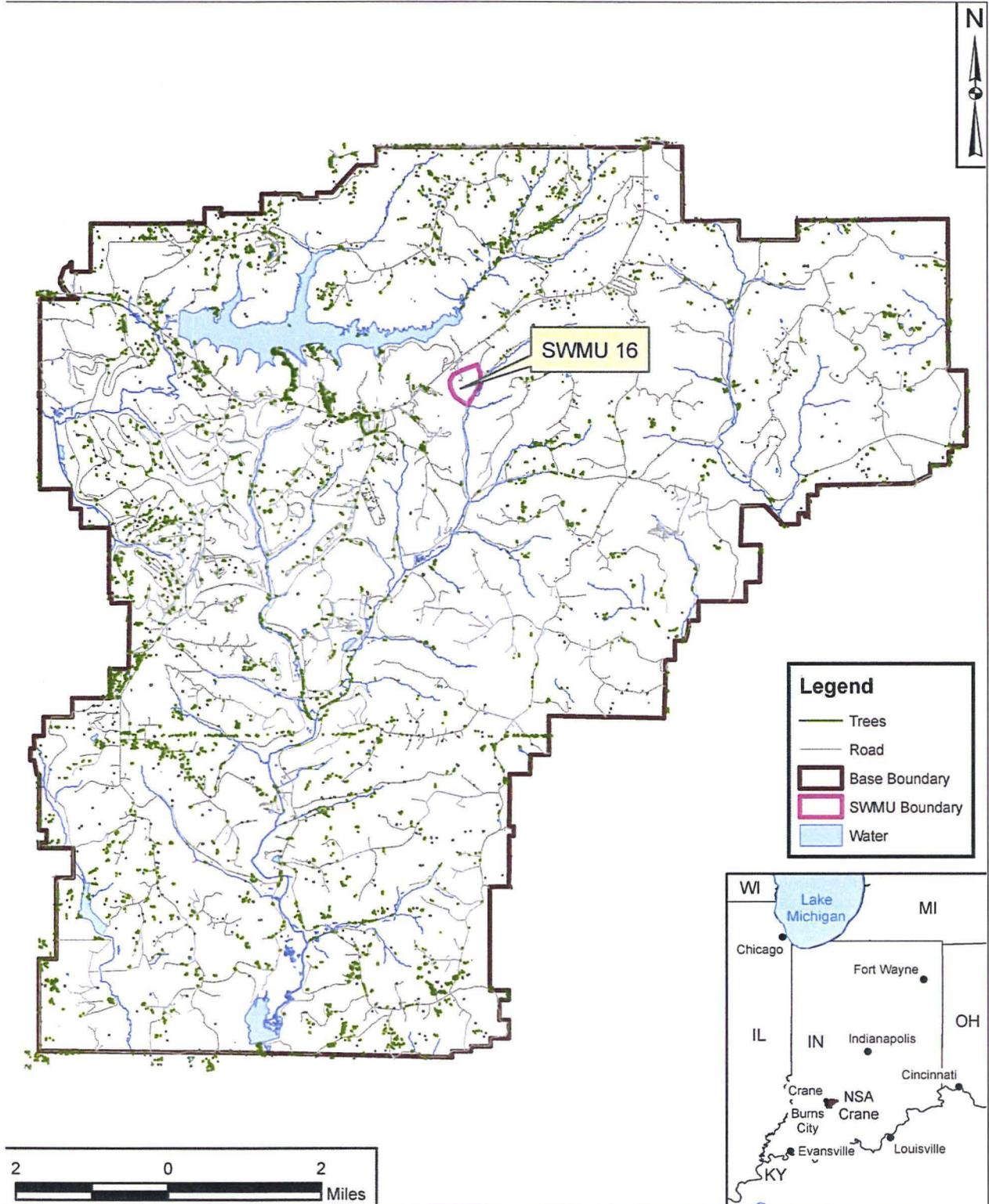


FIGURE 3-1

# OSHA's Form 300A (Rev. 01/2004) Summary of Work-Related Injuries and Illnesses

Year 2010



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

Form approved OMB no. 1218-0176

All establishments covered by Part 1904 must complete this Summary page, even if no injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the log. If you had no cases write "0."

Employees, former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR 1904.35, in OSHA's Recordkeeping rule, for further details on the access provisions for these forms.

### Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
0	0	1	2
(G)	(H)	(I)	(J)

### Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
0	2
(K)	(L)

### Injury and Illness Types

Total number of... (M)			
(1) Injury	3	(4) Poisoning	0
(2) Skin Disorder	0	(5) Hearing Loss	0
(3) Respiratory Condition	0	(6) All Other Illnesses	0

Post this Summary page from February 1 to April 30 of the year following the year covered by the form.

Public reporting burden for this collection of information is estimated to average 50 minutes per response, including time to review the instruction, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Ave, NW, Washington, DC 20210. Do not send the completed forms to this office.

### Establishment Information

Your establishment name Tetra Tech NUS, Inc.  
 Street Foster Plaza 7, 861 Andersen Drive  
 City Pittsburgh State Pennsylvania Zip 15220  
 Industry description (e.g., Manufacture of motor truck trailers)  
Environmental Consulting  
 Standard Industrial Classification (SIC), if known (e.g., SIC 3716)  
 OR North American Industrial Classification (NAICS), if known (e.g., 336212)  
5 4 1 8 2 0

### Employment Information

Annual average number of employees 465  
 Total hours worked by all employees last year 800,132

### Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

Mark T. Perry  
 Company executive

President  
 Title

(412) 921-7217  
 Phone

28-Jan-11  
 Date

# OSHA's Form 300 (Rev. 01/2004) Log of Work-Related Injuries and Illnesses

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

Year 2010  
U.S. Department of Labor  
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

You must record information about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR 1904.8 through 1904.12. Feel free to use two lines for a single case if you need to. You must complete an injury and illness incident report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Establishment name Tetra Tech NUS, Inc.  
City Pittsburgh State PA

Identify the person		Describe the case				Classify the case				Enter the number of days the injured or ill worker was:		Check the "injury" column or choose one type of illness:					
(A) Case No.	(B) Employee's Name	(C) Job Title (e.g., Welder)	(D) Date of injury or onset of illness (mo./day)	(E) Where the event occurred (e.g. Loading dock north end)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (e.g. Second degree burns on right forearm from acetylene torch)	CHECK ONLY ONE box for each case based on the most serious outcome for that case:				Away From Work (days)	On job transfer or restriction (days)	(M)					
						Death	Days away from work	Restricted at work	Other recordable cases	(K)	(L)	Injury	Skin Disorder	Respiratory Condition	Poisoning	Hearing Loss	All other illnesses
						(G)	(H)	Job transfer or restriction (I)	Other recordable cases (J)	(K)	(L)	(1)	(2)	(3)	(4)	(5)	(6)
NUS-2010-10	***** (Wilmington, MA)	Environmental Scientist	3/22/2010	NAVY CLEAN LANT CTO WE45	Back injury from lifting empty cooler and bottle/ware boxes			X			2	X					
NUS-2010-19	***** (Newark, DE)	Environmental Technician	12/3/2010	DNREC - Syntech Columbia	Cut hand with blade removing equipment from well				X			X					
NUS-2010-20	***** (Germantown, MD)	Graphic	12/7/2010	112 Germantown, MD - 2	Sprain Ankle				X			X					
Page totals						0	0	1	2	0	2	3	0	0	0	0	0

Be sure to transfer these totals to the Summary page (Form 300A) before you post it.

Public reporting burden for this collection of information is estimated to average 14 minutes per response, including time to review the instruction, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistics, Room N-3844, 200 Constitution Ave, NW, Washington, DC 20210. Do not send the completed forms to this office.

Injury (1)  
Skin Disorder (2)  
Respiratory Condition (3)  
Poisoning (4)  
Hearing Loss (5)  
All other illnesses (6)

# OSHA's Form 300A (Rev. 01/2004)

## Summary of Work-Related Injuries and Illnesses

Year 2011



U.S. Department of Labor  
Occupational Safety and Health Administration  
Form approved OMB no. 1210-0176

All establishments covered by Part 1904 must complete this Summary page, even if no injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the log. If you had no cases write "0."

Employees former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR 1904.35, in OSHA's Recordkeeping rule, for further details on the access provisions for these forms.

### Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
0	0	0	0
(G)	(H)	(I)	(J)

### Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
0	0
(K)	(L)

### Injury and Illness Types

Total number of... (M)	(1) Injury	(2) Skin Disorder	(3) Respiratory Condition	(4) Poisoning	(5) Hearing Loss	(6) All Other Illnesses
	0	0	0	0	0	0

Post this Summary page from February 1 to April 30 of the year following the year covered by the form

Public reporting burden for this collection of information is estimated to average 50 minutes per response, including time to review the instruction, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Ave, NW, Washington, DC 20210. Do not send the completed forms to this office.

Establishment Information	
Your establishment name	<u>Tetra Tech NUS, Inc.</u>
Street	<u>861 Andersen Drive, Foster Plaza 7</u>
City	<u>Pittsburgh</u> State <u>Pennsylvania</u> Zip <u>15220</u>
Industry description (e.g., Manufacture of motor truck trailers)	<u>Environmental Consulting</u>
Standard Industrial Classification (SIC), if known (e.g., SIC 3715)	
OR North American Industrial Classification (NAICS), if known (e.g., 336212)	<u>5 4 1 6 2 0</u>
Employment Information	
Annual average number of employees	<u>438</u>
Total hours worked by all employees last year	<u>872801</u>
Sign here	
Knowingly falsifying this document may result in a fine.	
I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.	
<u>Mark T. Perry</u> Company executive	President Title
<u>(412) 821-7217</u> Phone	<u>1/23/12</u> Date



# OSHA's Form 300A (Rev. 01/2004) Summary of Work-Related Injuries and Illnesses

Year 2012



U.S. Department of Labor  
Occupational Safety and Health Administration  
Form approved OMB no. 1218-0178

All establishments covered by Part 1904 must complete this Summary page, even if no injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the log. If you had no cases write "0."

Employees former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR 1904.35, in OSHA's Recordkeeping rule, for further details on the access provisions for these forms.

### Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
0	1	0	5
(G)	(H)	(I)	(J)

### Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
1	0
(K)	(L)

### Injury and Illness Types

Total number of... (M)		
(1) Injury	4	(4) Poisoning
(2) Skin Disorder	2	(5) Hearing Loss
(3) Respiratory Condition	0	(6) All Other illnesses
		0

Post this Summary page from February 1 to April 30 of the year following the year covered by the form

Public reporting burden for this collection of information is estimated to average 58 minutes per response, including time to review the instruction, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Ave, NW, Washington, DC 20210. Do not send the completed forms to this office.

**Establishment information**

Your establishment name Tetra Tech, NUS Operating Division

Street 861 Anderson Drive, Foster Plaza 7

City Pittsburgh State Pennsylvania Zip 15220

Industry description (e.g., Manufacture of motor truck trailers)  
Environmental Consulting

Standard Industrial Classification (SIC), if known (e.g., SIC 3715)

OR North American Industrial Classification (NAICS), if known (e.g., 336212)  
5 4 1 6 2 0

**Employment information**

Annual average number of employees 446

Total hours worked by all employees last year 994,740

**Sign here**

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

Mark T. Long President  
Company executive Title

(412) 921-7217 22-Jan-13  
Phone Date

# OSHA's Form 300 (Rev. 01/2004) Log of Work-Related Injuries and Illnesses

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

Year 2012  
  
**U.S. Department of Labor**  
 Occupational Safety and Health Administration

You must record information about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR 1904.8 through 1904.12. Feel free to use two lines for a single case if you need to. You must complete an injury and illness incident report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Form approved OMB no. 1218-0176

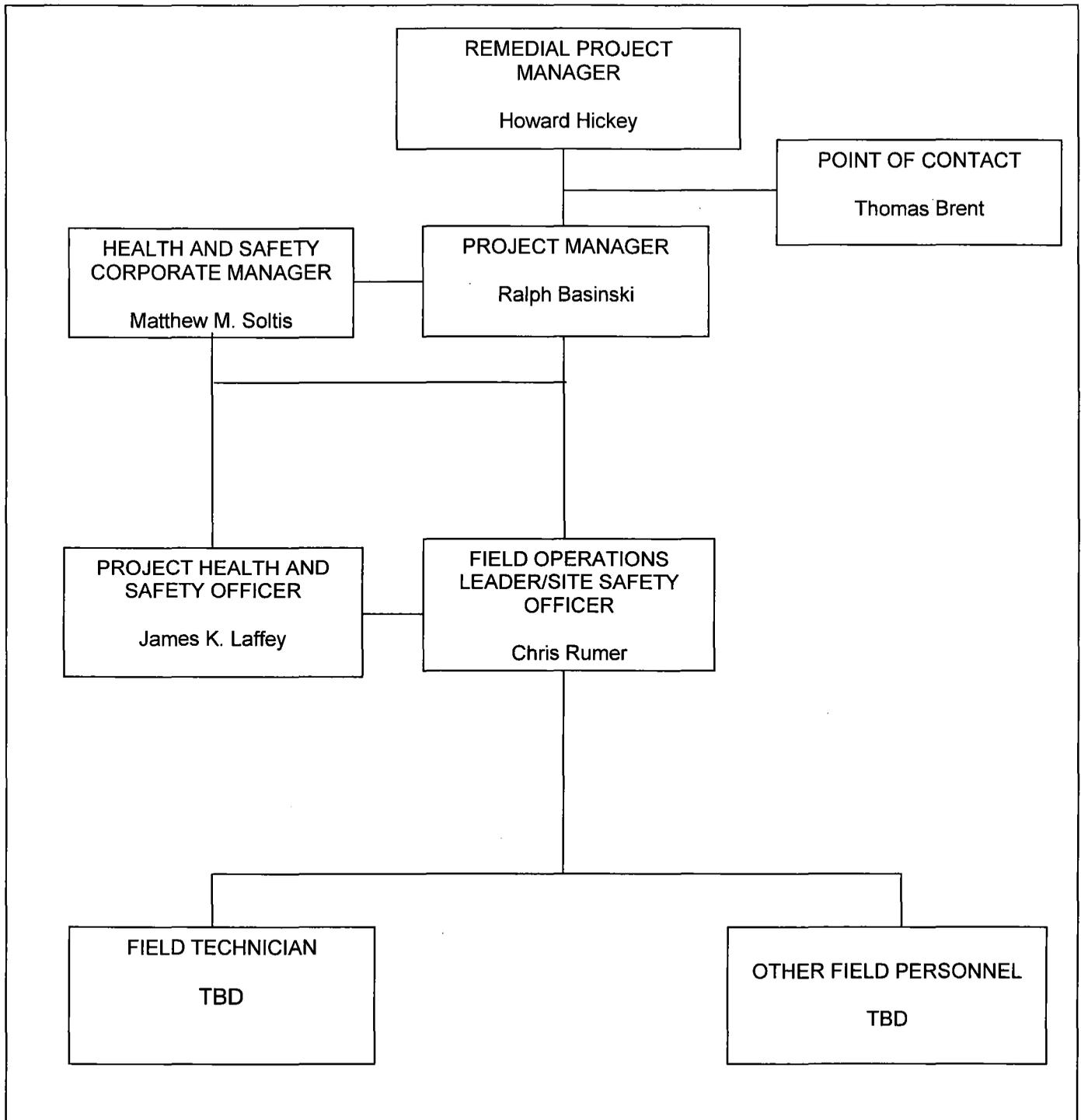
Establishment name Tetra Tech - 112 NUS  
 City Pittsburgh State PA

Identify the person		Describe the case				Classify the case				Enter the number of days the injured or ill worker was:									
(A) Case No.	(B) Employee's Name	(C) Job Title (e.g., Welder)	(D) Date of Injury or onset of illness (mo./day)	(E) Where the event occurred (e.g. Loading dock north end)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (e.g. Second degree burns on right forearm from acetylene torch)	CHECK ONLY ONE box for each case based on the most serious outcome for that case:				Away From Work (days)		On Job transfer or restriction (days)		Check the "injury" column or choose one type of illness:					
						Death	Days away from work	Remained at work		Away From Work (days) (K)	On Job transfer or restriction (days) (L)	(M)							
								Job transfer or restriction	Other recordable cases			Injury	Skin Disorder	Respiratory Condition	Poisoning	Hearing Loss	All other illnesses		
						(G)	(H)	(I)	(J)	(K)	(L)	(1)	(2)	(3)	(4)	(5)	(6)		
NUS-2012-12		UXO Tech I	7/26/2012	NAVY CLEAN LANT CTO JM10	Infected Chigger bit				X			X							
NUS-2012-25		Air Quality Specialist	8/10/2012	NAVY CLEAN LANT CTO F273	Multiple Stings - Yellow Jackets				X			X							
NUS-2012-3		Operator	1/27/2012	USCG-Alexandria Bay Potable	fractured arm				X			X							
NUS-2012-31		GIS Manager	9/5/2012	112 Germantown, MD - 1	Back Injury				X			X							
NUS-2012-39		Archaeological Field Technician	10/2/2012	MARINER EAST-ENVIRO/CULTURAL	Dermatitis from poison ivy				X				X						
NUS-2012-40		Archaeological Field Technician	10/1/2012	MARINER EAST-ENVIRO/CULTURAL	Dermatitis from poison ivy		X			1			X						
<b>Page totals</b>						0	1	0	5	1	0	4	2	0	0	0	0		

Be sure to transfer these totals to the Summary page (Form 300A) before you post it.

Public reporting burden for this collection of information is estimated to average 14 minutes per response, including time to review the instruction, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Ave, NW, Washington, DC 20210. Do not send the completed forms to this office.

**FIGURE 4-1  
ORGANIZATION CHART  
FIELD ACTIVITIES AT SWMU 16**



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

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

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

INSTRUCTIONS:		
Complete all sections below for incidents involving injury or illness. Do NOT leave any blanks. Attach this form to the IR FORM completed for this incident.		
Incident Report Number: (From the IR Form)		
EMPLOYEE INFORMATION		
Company Affiliation		
Tetra Tech Employee? <input type="checkbox"/> TetraTech subcontractor employee (directly supervised by Tt personnel)? <input type="checkbox"/>		
Full Name	Company (if not Tt employee)	
Street Address, City, State and Zip Code		Address Type
		Home address (for Tt employees) <input type="checkbox"/>
		Business address (for subcontractors) <input type="checkbox"/>
Telephone Numbers		
Work: _____	Home: _____	Cell: _____
Occupation (regular job title)	Department	
Was the individual performing regular job duties?		Time individual began work
Yes <input type="checkbox"/> No <input type="checkbox"/>		_____ AM <input type="checkbox"/> PM <input type="checkbox"/> OR Cannot be determined <input type="checkbox"/>
Safety equipment		
Provided? Yes <input type="checkbox"/> No <input type="checkbox"/>	Type(s) provided: <input type="checkbox"/> Hard hat <input type="checkbox"/> Protective clothing	
Used? Yes <input type="checkbox"/> No <input type="checkbox"/> If no, explain why	<input type="checkbox"/> Gloves <input type="checkbox"/> High visibility vest <input type="checkbox"/> Eye protection <input type="checkbox"/> Fall protection <input type="checkbox"/> Safety shoes <input type="checkbox"/> Machine guarding <input type="checkbox"/> Respirator <input type="checkbox"/> Other (list)	
NOTIFICATIONS		
Name of Tt employee to whom the injury or illness was first reported	Was H&S notified within one hour of injury or illness?	
	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Date of report	H&S Personnel Notified	
Time of report	Time of Report	
If subcontractor injury, did subcontractor's firm perform their own incident investigation?		
Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, request a copy of their completed investigation form/report and attach it to this report.		



**INJURY / ILLNESS DETAILS**

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

\_\_\_\_\_  
\_\_\_\_\_

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

\_\_\_\_\_  
\_\_\_\_\_

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

\_\_\_\_\_  
\_\_\_\_\_

**MEDICAL CARE PROVIDED**

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

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

Name of physician or health care professional	Facility Name
Street Address, City State and Zip Code	Type of Care?
Telephone Number	Was individual treated in emergency room? Yes <input type="checkbox"/> No <input type="checkbox"/>
	Was individual hospitalized overnight as an in-patient? Yes <input type="checkbox"/> No <input type="checkbox"/>
	Did the individual die? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, date: _____
	Will a worker's compensation claim be filed? Yes <input type="checkbox"/> No <input type="checkbox"/>

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

**SIGNATURES**

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

Affected individual (print)	Affected individual (signature)	Telephone Number	Date

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

INSTRUCTIONS:			
Complete all sections below for incidents involving property/equipment damage, fire, spill or release. Do NOT leave any blanks. Attach this form to the IR FORM completed for this incident.			
Incident Report Number: (From the IR Form)			
TYPE OF INCIDENT (Check all that apply)			
Property Damage <input type="checkbox"/>	Equipment Damage <input type="checkbox"/>	Fire or Explosion <input type="checkbox"/>	Spill or Release <input type="checkbox"/>
INCIDENT DETAILS			
<b>Results of Incident:</b> Fully describe damages, losses, etc.			
_____			
_____			
Response Actions Taken:			
_____			
_____			
Responding Agency(s) (i.e. police, fire department, etc.)		Agency(s) Contact Name(s)	
_____		_____	
DAMAGED ITEMS (List all damaged items, extent of damage and estimated repair cost)			
Item:	Extent of damage:	Estimated repair cost	
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	
SPILLS / RELEASES (Provide information for spilled/released materials)			
Substance	Estimated quantity and duration	Specify Reportable Quantity (RQ)	
_____	_____	_____ Exceeded? Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	
FIRES / EXPLOSIONS (Provide information related to fires/explosions)			
Firefighting equipment used? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, type of equipment: _____			
NOTIFICATIONS			
Required notifications	Name of person notified	By whom	Date / Time
Client: _____ Yes <input type="checkbox"/> No <input type="checkbox"/>	_____	_____	_____
Agency: _____ Yes <input type="checkbox"/> No <input type="checkbox"/>	_____	_____	_____
Other: _____ Yes <input type="checkbox"/> No <input type="checkbox"/>	_____	_____	_____
Who is responsible for reporting incident to outside agency(s)? Tt <input type="checkbox"/> Client <input type="checkbox"/> Other <input type="checkbox"/> Name: _____			
Was an additional written report on this incident generated? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, place in project file.			

INSTRUCTIONS:			
Complete all sections below for incidents involving motor vehicle accidents. Do NOT leave any blanks. Attach this form to the IR FORM completed for this incident.			
Incident Report Number: (From the IR Form)			
INCIDENT DETAILS			
Name of road, street, highway or location where accident occurred		Name of intersecting road, street or highway if applicable	
County	City	State	
Did police respond to the accident?		Did ambulance respond to the accident?	
Yes <input type="checkbox"/> No <input type="checkbox"/>		Yes <input type="checkbox"/> No <input type="checkbox"/>	
Name and location of responding police department		Ambulance company name and location	
Officer's name/badge #			
Did police complete an incident report? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, police report number: _____ Request a copy of completed investigation report and attach to this form.			
VEHICLE INFORMATION			
How many vehicles were involved in the accident? _____ (Attach additional sheets as applicable for accidents involving more than 2 vehicles.)			
Vehicle Number 1 – Tetra Tech Vehicle		Vehicle Number 2 – Other Vehicle	
Vehicle Owner / Contact Information		Vehicle Owner / Contact Information	
Color		Color	
Make		Make	
Model		Model	
Year		Year	
License Plate #		License Plate #	
Identification #		Identification #	
Describe damage to vehicle number 1		Describe damage to vehicle number 2	
Insurance Company Name and Address		Insurance Company Name and Address	
Agent Name		Agent Name	
Agent Phone No.		Agent Phone No.	
Policy Number		Policy Number	

DRIVER INFORMATION						
Vehicle Number 1 – Tetra Tech Vehicle			Vehicle Number 2 – Other Vehicle			
Driver's Name				Driver's Name		
Driver's Address				Driver's Address		
Phone Number				Phone Number		
Date of Birth				Date of Birth		
Driver's License #				Driver's License #		
Licensing State				Licensing State		
Gender		Male <input type="checkbox"/> Female <input type="checkbox"/>		Gender		Male <input type="checkbox"/> Female <input type="checkbox"/>
Was traffic citation issued to Tetra Tech driver? Yes <input type="checkbox"/> No <input type="checkbox"/>			Was traffic citation issued to driver of other vehicle? Yes <input type="checkbox"/> No <input type="checkbox"/>			
Citation #				Citation #		
Citation Description				Citation Description		
PASSENGERS IN VEHICLES (NON-INJURED)						
List all non-injured passengers (excluding driver) in each vehicle. Driver information is captured in the preceding section. Information related to persons injured in the accident (non-Tt employees) is captured in the section below on this form. Injured Tt employee information is captured on FORM IR-A						
Vehicle Number 1 – Tetra Tech Vehicle			Vehicle Number 2 – Other Vehicle			
How many passengers (excluding driver) in the vehicle? _____			How many passengers (excluding driver) in the vehicle? _____			
Non-Injured Passenger Name and Address				Non-Injured Passenger Name and Address		
Non-Injured Passenger Name and Address				Non-Injured Passenger Name and Address		
Non-Injured Passenger Name and Address				Non-Injured Passenger Name and Address		
INJURIES TO NON-TETRATECH EMPLOYEES						
Name of injured person 1				Address of injured person 1		
Age	Gender	Car No.	Location in Car	Seat Belt Used?	Ejected from car?	Injury or Fatality?
	Male <input type="checkbox"/> Female <input type="checkbox"/>			Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Injured <input type="checkbox"/> Died <input type="checkbox"/>
Name of injured person 2				Address of injured person 2		
Age	Gender	Car No.	Location in Car	Seat Belt Used?	Ejected from car?	Injury or Fatality?
	Male <input type="checkbox"/> Female <input type="checkbox"/>			Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Injured <input type="checkbox"/> Died <input type="checkbox"/>

**OTHER PROPERTY DAMAGE**

Describe damage to property other than motor vehicles

Property Owner's Name

Property Owner's Address

COMPLETE AND SUBMIT DIAGRAM DEPICTING WHAT HAPPENED

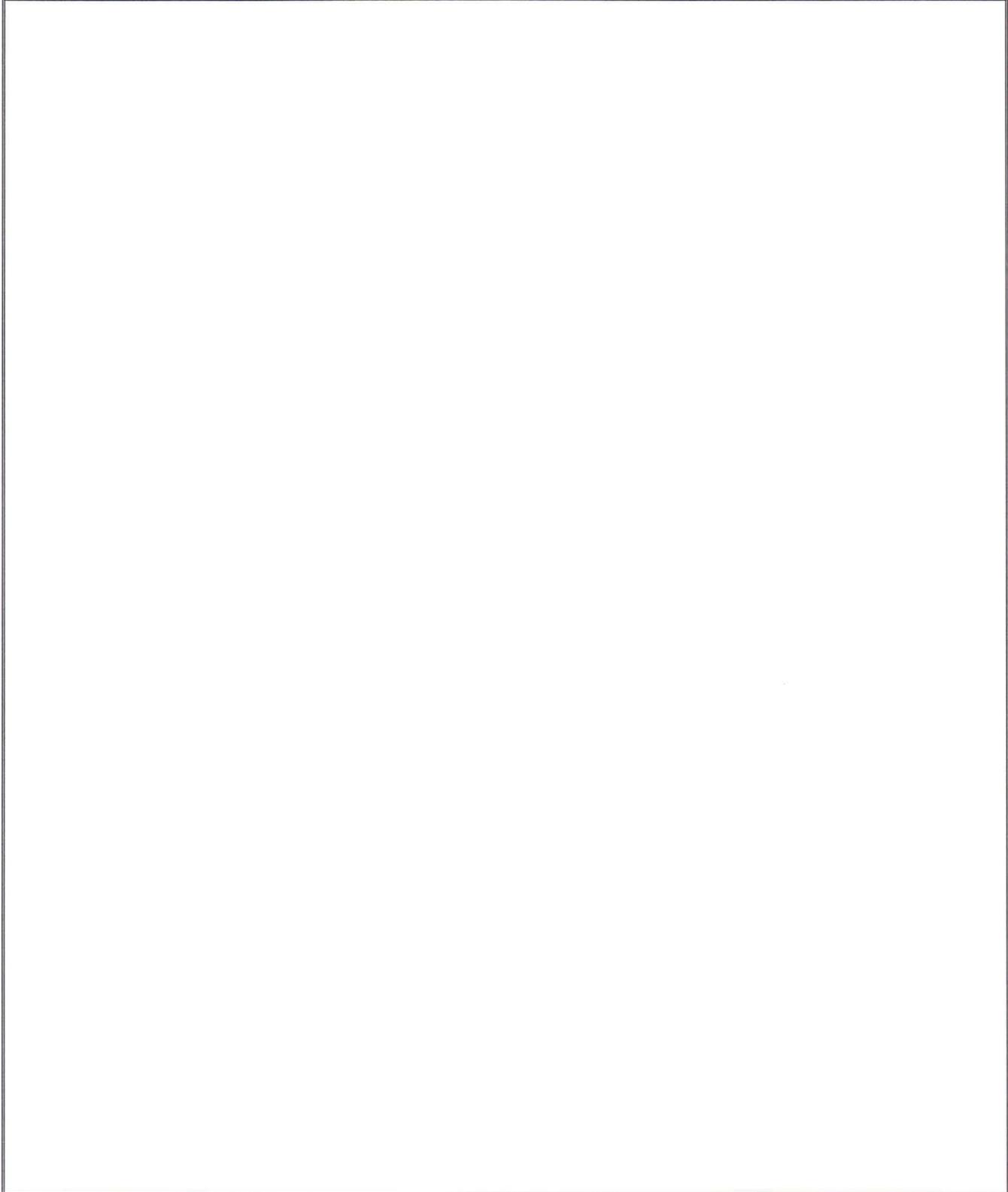


FIGURE 9-1

ROUTE TO HOSPITALS

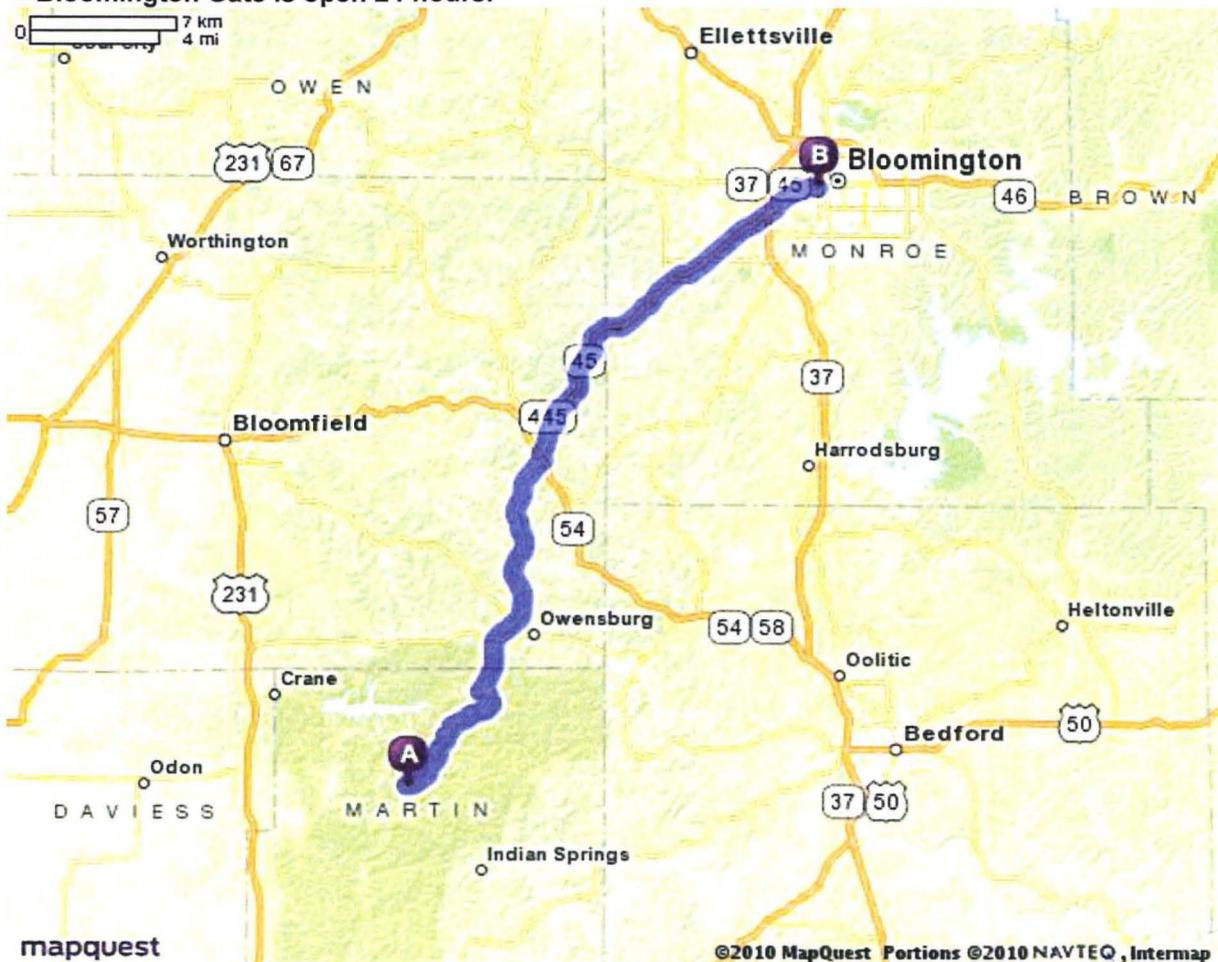
**Bloomington Hospital 601 W. 2nd ST. Bloomington, Indiana 47402**

30.63 miles - about 54 minutes

- Exit NSA Crane on H-45 through the Bloomington Gate.
- Follow Highway 45 North to Bloomington at Highway 45 and Highway 37.
- Continue going straight over the overpass (Bloomfield Rd).
- Follow Bloomfield Road North; this road turns into 2nd St
- Follow 2nd Street, hospital will be on the right

**BLOOMINGTON HOSPITAL ROUTE MAP VIA BLOOMINGTON GATE**

**Bloomington Gate is open 24 hours.**



**Bedford Medical Center 2900 16th Street Bedford, Indiana 47421**

19.2 miles - about 40 minutes

- Exit the base on H-58, through the Bedford Gate.
- Head East on State Highway 158.
- State Highway 158 becomes 16th Street upon entering the City of Bedford.
- The medical center is on the right shortly after Plaza Drive.

**MAP TO BEDFORD MEDICAL CENTER ROUTE MAP VIA BEDFORD GATE**

Bedford Gate is open from 0600 - 0830 and 1500 - 1800 hours

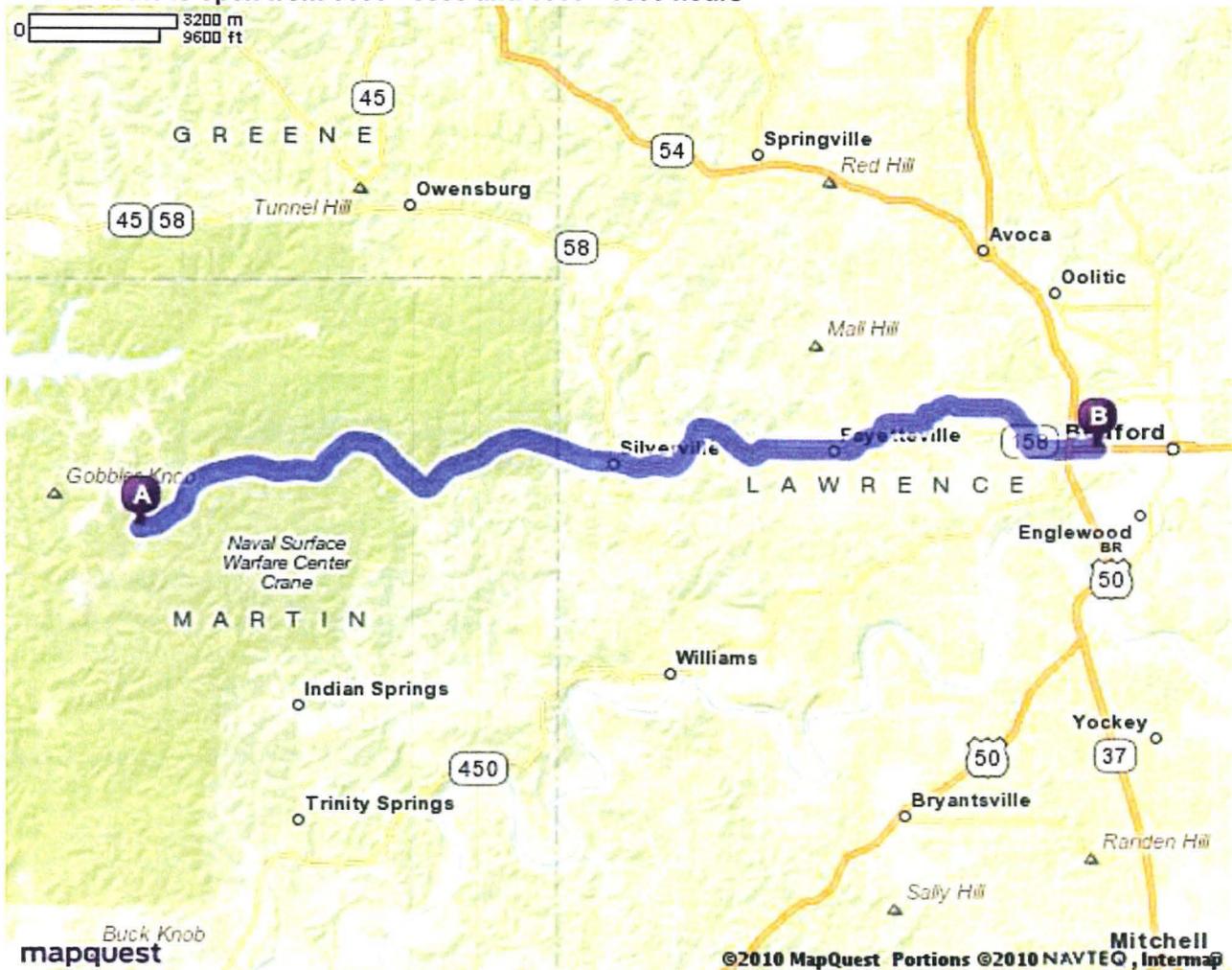


FIGURE 9-2

MEDICAL DATA SHEET

This Medical Data Sheet must be completed by on-site personnel and kept in a secured location or on your person during 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 \_\_\_\_\_  
(Relationship): \_\_\_\_\_ Phone: \_\_\_\_\_  
Drug or other Allergies: \_\_\_\_\_  
Doctor Prescribed Antidotes: \_\_\_\_\_ Prescription Expiration date: \_\_\_\_\_  
Particular Sensitivities (Previous Medical Conditions): \_\_\_\_\_  
\_\_\_\_\_

Do You Wear Contact Lenses? \_\_\_\_\_

What medications are you presently using? \_\_\_\_\_  
\_\_\_\_\_

Name, Address, and Phone Number of your personal physician: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

HIPAA took effect in 1996 then was amended in June 14, 2003. Loosely interpreted, HIPAA regulates the disclosure of Protected Health Information (PHI) by the entity collecting that information. PHI is any information about health status (such as that you may report on this Medical Data Sheet), provision of health care, or other information. HIPAA also requires Tetra Tech to ensure the confidentiality of PHI. This Act can affect the ability of the Medical Data Sheet to contain and convey information you would want a Doctor to know if you were incapacitated. So before you complete the Medical Data Sheet understand that this form may 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 access this form so it may 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



FIGURE 9-4

REQUIREMENTS FOR BASIC UNIT FIRST AID PACKAGES

Unit first aid item	Minimum Size or Volume (metric)	Minimum Size or Volume (US)	Item quantity per unit package	Unit package size
*Absorbent Compress	206 cm <sup>2</sup>	32 in <sup>2</sup>	1	1
* Adhesive Bandage	2.5 x 7.5 cm	1 x 3 in.	16	1
Antibiotic Treatment	0.9 g	1/32 oz.	6	1
* Adhesive Tape	457.2 cm	5 yd. (total)	1 or 2	1 or 2
* Antiseptic Swab.	0.5 g	0.14 fl. Oz.	10	1
Antiseptic Wipe	2.5 x 2.5 cm	1 x 1 in.	10	1
Antiseptic Towelette	157 cm <sup>2</sup>	24 in.	10	1
Aspirin, Individually Wrapped	325 mg		2	2
Bandage Compress (2 in.)	5 x 91 cm	2 x 36 in.	4	1
Bandage Compress (3 in.)	7.5 x 152 cm	3 x 60 in.	2	1
Bandage Compress (4 in.)	10 x 183 cm	4 x 72 in.	1	1
Burn Dressing	10 x 10 cm	4 x 4 in.	1	1-2
* Burn Treatment	0.9	1/32 fl. oz.	6	1
CPR Barrier			1	1
Cold Pack	10 x 12.5 cm	4 x 5 in	1	1-2
Eye Covering, with means of attachment	19 cm <sup>2</sup>	2.9 in <sup>2</sup>	2	1
Eye Wash	30 ml	1 fl. Oz. total	1	2
Eye Wash & Covering, with means of attachment	30 ml total 19 cm <sup>2</sup>	1 fl. oz. total 2.9 in <sup>2</sup>	1 2	2
Gloves, latex free	XL	XL	1 pair	1
Gloves, latex free	L	L	1 pair	1
Roller Bandage (4 in.)	10 x 550 cm	4 in. x 6 yd.	1	1
Roller Bandage (2 in.) 2 1	5 x 550 cm	2 in. x 6 yd.	2	1
* Sterile pad	7.5 x 7.5 cm	3 x 3 in.	4	1
* Triangular Bandage	101 x 101 x 142 cm	40 x 40 x 56 in.	1	1

\* Minimum mandatory contents for basic fill kit

## **ATTACHMENTS**

**ATTACHMENT I**

**SITE-SPECIFIC TRAINING DOCUMENTATION FORM**

**AND**

**EMPLOYEE TRAINING/QUALIFICATIONS/MEDICAL**

**CLEARANCE**

**TO BE ATTACHED BY PM/FOL/SSO**

**(40-Hour HAZWOPER Certificates; 8-Hour HAZWOPER  
Refresher Certificates; First Aid/CPR Certificates;  
employee resumes as required)**



Insert employee documents here.

**ATTACHMENT II**

**OSHA POSTER**

# Job Safety and Health

## It's the law!

### EMPLOYEES:

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

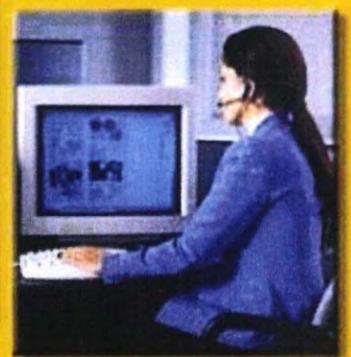
### EMPLOYERS:

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

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

# OSHA

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



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

**1-800-321-OSHA**  
[www.osha.gov](http://www.osha.gov)

OSHA 3165-12-06R