



FINAL
8 AUGUST 2012

Accident Prevention Plan

Wetlands Delineation and Impact Study at
the Former Lake Hancock Target Range,
Site EO351

NAS Whidbey Island

Whidbey Island, Washington

Department of the Navy

Naval Facilities Engineering Command Northwest

1101 Tautog Circle, Suite 203

Silverdale, WA 98315-1101



INTRODUCTION

This Accident Prevention Plan (APP) and Site Safety and Health Plan (SSHP [Attachment 1]) discuss the safety and health policies, practices, and controls that will be implemented by all Tetra Tech employees and its subcontractors involved in the wetlands delineation and impact study at the former Lake Hancock Target Range, Site EO351, located at the Naval Air Station Whidbey Island (NASWI), Oak Harbor, Washington. This APP/SSHP specifies all mandatory health and safety requirements in accordance with Appendix A and Section 28 of the September 15, 2008, U.S. Army Corps of Engineers (USACE) Manual (EM 385-1-1) (USACE 2008), and the USACE Safety and Occupational Health Requirements for Hazardous, Toxic, and Radioactive Waste Activities (ER 385-1-92) (USACE 2007), 29 Code of Federal Regulations (CFR) 1910.120, applicable sections of 29 CFR 1926, including the Washington State Department of Labor and Industries rules and regulations, as written in the Washington Administrative Code Chapter 296. Modifications to this APP will be reviewed and approved by the Tetra Tech Project Environmental and Safety Manager (PESM), the U.S. Navy's Contracting Officer, and the Naval Facilities Engineering Command, Northwest Health and Safety Manager.

The work will also be conducted as per Tetra Tech's Corporate Health and Safety Program. Many elements of the corporate program are referenced in this APP/SSHP. Those that are directly applicable to the work have been appended to this plan and made site-specific. These procedures will be made available to all workers at all times.

Tetra Tech, its subcontractors, and its clients do not guarantee the health or safety of any person entering this site. Because of the nature of this site and the planned activities, it is not possible to discover, evaluate, and provide protection for all possible hazards that may be encountered. Strict adherence to the safety and health guidelines set forth in this APP/SSHP will reduce, but not eliminate, the potential for injury at this site. The safety and health guidelines in this plan were prepared specifically for this site and should not be used on any other site without prior research and evaluation by trained safety and health specialists.

The content of this APP/SSHP may change or undergo revision based on additional information made available to safety and health personnel, monitoring results, or changes in the technical scope of work. Any changes proposed which require changes to the APP/SSHP and associated Activity Hazard Analyses must be reviewed by the Tetra Tech's Site Safety and Health Officer and are subject to the approval of the PESH.

This page intentionally left blank.

CONTENTS

1.0	SIGNATURE PAGE	1-1
2.0	BACKGROUND INFORMATION	2-1
2.1	CONTRACTOR NAME	2-1
2.2	CONTRACT NUMBER	2-1
2.3	PROJECT NAME	2-1
2.4	DESCRIPTION OF WORK TO BE PERFORMED	2-1
3.0	SAFETY AND HEALTH POLICY	3-1
4.0	RESPONSIBILITIES AND LINES OF AUTHORITY	4-1
4.1	DECLARATION OF HEALTH AND SAFETY PROGRAM RESPONSIBILITY	4-1
4.2	IDENTIFICATION AND ACCOUNTABILITY OF PROJECT PERSONNEL	4-1
4.3	COMPETENT PERSONS	4-5
4.4	REQUIREMENT OF COMPETENT PERSON OVERSIGHT	4-6
4.5	PRE-TASK SAFETY AND HEALTH ANALYSIS	4-6
4.6	LINES OF AUTHORITY	4-7
4.7	NON-COMPLIANCE SAFETY REQUIREMENTS	4-7
4.8	MANAGEMENT ACCOUNTABILITY	4-8
5.0	SUBCONTRACTOR AND SUPPLIERS	5-1
5.1	IDENTIFICATION OF SUBCONTRACTORS	5-1
5.2	SAFETY RESPONSIBILITIES OF SUBCONTRACTORS	5-1
6.0	TRAINING REQUIREMENTS	6-1
6.1	NEW HIRE SAFETY AND HEALTH ORIENTATION TRAINING	6-1
6.2	MANDATORY TRAINING AND CERTIFICATIONS	6-1
6.3	PERIODIC SAFETY AND HEALTH TRAINING	6-3
6.4	EMERGENCY RESPONSE TRAINING	6-3
6.5	SSHP ACCEPTANCE FORM	6-5
7.0	SAFETY AND HEALTH INSPECTIONS	7-1
7.1	INSPECTION RESPONSIBILITIES	7-1
7.2	EXTERNAL INSPECTIONS	7-1
8.0	ACCIDENT REPORTING	8-1
8.1	EXPOSURE DATA	8-1
8.2	ACCIDENT INVESTIGATIONS, REPORTS, AND LOGS	8-1
8.3	NOTIFICATIONS	8-2

9.0	PLANS AND PROCEDURES REQUIRED BY THE USACE SAFETY AND HEALTH REQUIREMENTS MANUAL	9-1
9.1	SITE LAYOUT PLAN	9-2
9.2	EMERGENCY RESPONSE PLAN	9-3
	9.2.1 Procedures and Tests	9-5
	9.2.2 Spill Plans	9-6
	9.2.3 Firefighting Plan	9-8
	9.2.4 Posting of Emergency Telephone Numbers	9-9
	9.2.5 Medical Support	9-9
9.3	PLAN FOR PREVENTION OF ALCOHOL AND DRUG ABUSE	9-13
9.4	SITE SANITATION PLAN	9-13
9.5	ACCESS AND HAUL ROAD PLAN	9-14
9.6	HEALTH HAZARD CONTROL PLAN	9-14
9.7	HAZARD COMMUNICATION PROGRAM	9-15
9.8	THERMAL STRESS MONITORING PLAN	9-15
9.9	FIRE PREVENTION PLAN	9-23
9.10	WILD LAND FIRE MANAGEMENT PLAN	9-23
9.11	CONTINGENCY PLAN FOR SEVERE WEATHER	9-24
10.0	RISK MANAGEMENT PROCESSES	10-1
11.0	REFERENCES	11-1
ATTACHMENT 1	SITE SAFETY AND HEALTH PLAN	
ATTACHMENT 2	RESUMES OF PROJECT PERSONNEL	
ATTACHMENT 3	CERTIFICATIONS	
ATTACHMENT 4	FIELD HEALTH AND SAFETY FORMS	
ATTACHMENT 5	GENERAL SAFE WORK PRACTICES FOR FIELD WORK	
ATTACHMENT 6	ACTIVITY HAZARD ANALYSIS	

FIGURES

Figure 4-1.	Tetra Tech Organization Chart	4-9
Figure 9-1.	Location Map	9-25
Figure 9-2.	Emergency Route to Hospital	9-26

TABLES

Table 9-1.	Emergency Contact List	9-4
Table 9-2.	Type and Location of Emergency Equipment	9-4

ACRONYMS AND ABBREVIATIONS

AHA	Activity Hazard Analysis
APP	Accident Prevention Plan
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CIRS	Contractor Information Reporting System
CPR	cardiopulmonary resuscitation
CSIR	Contractor Safety Incident Report
DCN	Design Change Notice
EC	Emergency Coordinator
EHS	Environmental Health and Safety
ESAMS	Enterprise Safety Applications Management System
ESS	Explosive Safety Submission
°F	degrees Fahrenheit
FCR	Field Change Request
FOL	Field Operations Lead
GIS	geographic information system
GPS	global positioning system
HAZWOPER	Hazardous Waste Operations and Emergency Response
KO	Contracting Officer
LHTR	Lake Hancock Target Range
MEC	munitions and explosives of concern
MPPEH	material potentially posing an explosive hazard
MSDS	Material Safety Data Sheet

ACRONYMS AND ABBREVIATIONS (continued)

NASWI	Naval Air Station Whidbey Island
NAVFAC NW	Naval Facilities Engineering Command, Northwest
Navy	U.S. Navy
NCR	Non-Conformance Report
NTR	Navy Technical Representative
OSHA	Occupational Safety and Health Administration
PESM	Project Environmental and Safety Manager
PPE	personal protective equipment
PQCM	Project Quality Control Manager
QC	quality control
RPM	Remedial Project Manager
RQ	reportable quantity
SHA	Site Hazard Assessment
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
TOM	Task Order Manager
USACE	U.S. Army Corps of Engineers
UXO	unexploded ordnance
WAC	Washington Administrative Code
WISHA	Washington Industrial, Safety, and Health Act
ZIP	Zero Incident Performance

1.0 SIGNATURE PAGE

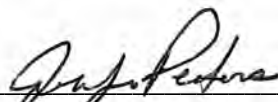
FINAL ACCIDENT PREVENTION PLAN

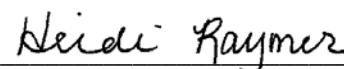
FOR WETLANDS DELINEATION AND IMPACT STUDY AT THE FORMER LAKE
HANCOCK TARGET RANGE, SITE EO351,
NAVAL AIR STATION WHIDBEY ISLAND, WASHINGTON

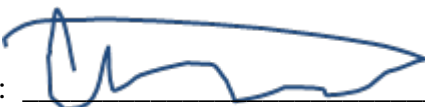
CONTRACT N62470-08-D-1008

TETRA TECH

AUGUST 8, 2012

Prepared by: 
Jennifer Peters
Sr. Environmental, Health and Safety Specialist
(360) 598-8108

Reviewed by: 
Heidi Raymer, RN, BSN, COHN-S
Director of Health and Safety
Project Environmental and Safety Manager
(703) 447-8244

Approved by: 
Dr. Chris Soucier, PhD
Program Director
(212) 933-0002

2.0 BACKGROUND INFORMATION

2.1 CONTRACTOR NAME

Tetra Tech

2.2 CONTRACT NUMBER

N62470-08-D-1008, Contract Task Order JP01.

2.3 PROJECT NAME

Wetlands Delineation and Impact Study at the former Lake Hancock Target Range (LHTR), Site EO351, Naval Air Station Whidbey Island, Washington.

2.4 DESCRIPTION OF WORK TO BE PERFORMED

The former LHTR was used as a target area for aerial practice bombing and rocketry training between 1943 and 1971. Aircraft on training runs would typically approach from the east, make a steep diving approach over the target area, and after releasing the practice bombs, continue over Admiralty Inlet to the west. The purpose of this project is to define the boundaries of the wetland area for future remedial action planning purposes and to identify what effects the removal activities could have on this sensitive environment.

During this fieldwork, a wetlands biologist/Field Operations Lead (FOL) and field technician using a handheld global positioning system (GPS) will be delineating and characterizing wetlands at the LHTR. Based on this information, they will determine if there are any portions of the site where intrusive removal from the surface to a depth of 1 foot below the surface would cause irreparable damage or impacts to the wetlands to the extent that digging should be avoided. The team will be accompanied by an unexploded ordnance (UXO) technician/Site Safety and Health Officer (SSHO) who will provide MEC avoidance and oversight for the team. Any areas where intrusive activities would cause irreparable damage or impacts to the wetlands will be identified by GPS coordinates and mapped. This work is being performed in advance of MEC removal that may be performed in a future remedial action. During the wetlands delineation and the impact study, as many as 16 soil samples will be collected from the surface up to 1 foot in depth and analyzed for sulfide and sulfite at a qualified laboratory. A complete description of the work activities, site history and property description is included in the Work Plan.

This work will consist of the following work elements:

- Mobilization/demobilization of equipment and materials
- Wetlands delineation and characterization
- Environmental soil sampling

The above activities present several hazards to workers depending on the task as well as the location where the work will be performed. Mitigations for the hazards associated with the work are presented in this APP and in the SSHP included as Attachment 1.

3.0 SAFETY AND HEALTH POLICY

	TETRA TECH, INC. HEALTH AND SAFETY POLICY STATEMENT	Revision Date: 2/23/2009
		Document Control Number:
		0-0
		Page 1 of 1

Tetra Tech, Inc. is committed to providing and maintaining a healthy and safe work environment for all associates. A strong health and safety (H&S) program protects both individuals and Tetra Tech and ensures the success of both parties. Tetra Tech's program is designed to address the hazards associated with our business and prevent injury and illness in the workplace. Tetra Tech intends to meet its responsibilities for health and safety by committing to the following:

Complying with applicable federal and state standards, laws and regulations,

Designating personnel accountable for implementing H&S programs,

Communicating H&S programs and practices throughout the organization,

Mitigating potential risks through hazard identification and assessment, employee training and safe work practices,

Allocating sufficient resources to the program,

Implementing enforcement and accountability measures, and

Establishing H&S performance standards that meet or exceed national performance levels.

All management are responsible for ensuring that all aspects of the workplace, including offices and project locations, are safe and that any risks, hazards and safety violations brought to their attention are investigated and corrected promptly.

All associates and subcontractors are responsible for complying with Tetra Tech's H&S policy, programs and standards, and conducting their work safely and without detriment to themselves, other employees or property.

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

Dan L. Batrack
Director, Chief Executive Officer and Chief Operating Officer
Tetra Tech, Inc.

4.0 RESPONSIBILITIES AND LINES OF AUTHORITY

4.1 DECLARATION OF HEALTH AND SAFETY PROGRAM RESPONSIBILITY

Tetra Tech's management, including the Task Order Manager (TOM) and the FOL, take ultimate responsibility for implementing the corporate health and safety program on this project, including this APP/SSHP. Controlling job site hazards and preventing accidents and injuries, however, requires the participation of all project personnel including the SSHO, site workers, and subcontractors. To this extent, everyone associated with the work has a role to play in ensuring that a safe and healthful work environment exists throughout the project. These specific roles and responsibilities are described in greater detail below.

4.2 IDENTIFICATION AND ACCOUNTABILITY OF PROJECT PERSONNEL

Tetra Tech project staff positions for this project include the TOM, Angie Peace. The FOL for the wetlands delineation work is Laura Miller, the wetlands biologist. The geographic information system (GIS) technician and Project Quality Control Manager (PQCM) for the project is Barbara Leonard. The SSHO is Mark Ladd. Mark Ladd is also a qualified UXO technician who will brief site workers on potential UXO hazards and provide UXO avoidance for the field team performing the wetlands delineation and impact study (see Section 3.4 of the Work Plan). General health and safety oversight of the work will be provided by the Project Environmental Safety Manager (PESM), Heidi Raymer. Both the PQCM/SSHO and the PESM will be supported by Tetra Tech's Environmental Compliance and Quality Control Program Managers as necessary.

The lines of authority of these individuals are described below and are graphically shown in Figure 4-1. The following requirements apply to these personnel:

Task Order Manager

The TOM shall be responsible for the management of all aspects of the project for Tetra Tech, including safety and health. The TOM shall provide management of, and direction to, the project personnel assigned to the project.

Field Operations Lead

The FOL shall be responsible for the management of Tetra Tech site personnel assigned to the project and overall implementation of the field activities in the Work Plan and this APP/SSHP. The FOL will provide direction for the activities of the field personnel and shall keep the TOM informed as to personnel requirements and scheduled release dates. The FOL will be responsible for the following:

- Supervising site personnel.
- Coordinating with home office staff.
- Ensuring completion of the work activities in accordance with the contract documents and applicable codes and standards.
- Ensuring completion of the project on schedule and within budget, in accordance with the project plans and procedures.
- Ensuring that appropriate change management procedures are in place.
- Ensuring compliance with all environmental, health, and safety requirements, including corporate policies, programs, and procedures; Occupational Safety and Health Administration (OSHA); Washington Industrial Safety and Health Act (WISHA); Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) if applicable; EM 385 1-1; and any client-specific requirements as included in this plan.
- Ensuring that adequate site security, appropriate for the activities being performed, is maintained.
- Implementing material control requirements in accordance with Government Property Control Procedures.
- Ensuring that an adequate labor force is assigned to the project with the proper training, education, experience, skills, tools, equipment, and materials to complete the field effort and minimize potential impacts to the environment.
- Acting as Emergency Coordinator (EC) for all emergencies.
- Preparing and submitting (electronically) the Daily Contractor Production Report to the Navy Technical Representative (NTR) and TOM.

The FOL resume is provided in Attachment 2.

Project Quality Control Manager

The PQCM is responsible for all matters relating to project quality. Responsibilities of the PQCM include, but are not limited to, the following:

- Implementing and maintaining the on-site quality control (QC) program. Providing and maintaining an effective QC system for all project tasks.
- Monitoring QC activities to ensure conformance with authorized policies, procedures, and sound construction practices, as well as recommending improvements as necessary.

- Conducting meetings with site personnel covering the requirements of the QC procedures, as appropriate.
- Performing inspections and surveillances of Tetra Tech and its subcontractors' project activities to ensure that project procedures are being followed.
- Informing, identifying, and resolving non-conformances in accordance with the requirements of the project QC plan. The PQCM has the authority to stop work when non-conformance is identified. The work will not resume until the non-conformance is addressed to the satisfaction of the PQCM.
- Preparing and signing the Contractor Quality Control Reports.
- Preparing and submitting (electronically) the monthly Rework Items List to the NTR, Remedial Project Manager (RPM), TOM, and Program QC Manager.
- Updating and submitting monthly (electronically) the Submittal Register to the NTR, RPM, TOM, and Program QC Manager.
- Maintaining awareness of the entire project to detect conditions that may be adverse to quality.
- Monitoring corrective action documentation for conditions adverse to quality, tracking and verifying implementation of corrective actions, and providing closeout documentation upon completion.
- Concurring with Non-Conformance Report (NCR) dispositions and maintaining a system for tracking and analyzing NCRs.
- Functioning as a liaison with the client and subcontractors' quality personnel.
- Ensuring that the project document control and filing system are implemented.
- Ensuring that all records, logs, permits, regulatory-required documentation (e.g., inspections), manufacturers' instructions, warranties, standard procedures, and project plans are maintained and stored in a retrievable manner, and that controlled copies of standard procedures and project plans are available to all appropriate personnel.
- Ensuring that training records of site personnel are maintained in accordance with Tetra Tech procedures and government regulations.
- Ensuring that Tetra Tech and its subcontractors use only the latest approved plans.
- Ensuring accurate interpretation and application of the plans.
- Supporting the FOL with administration and oversight of the subcontractors.

- Preparing and tracking Field Change Requests (FCRs) and Design Change Notices (DCNs) when required to obtain design engineering approval of requested field and design changes.
- Updating plans when changes, such as an approved FCR or DCN, are warranted.
- Taking progress photographs and assisting with preparation of monthly progress reports.
- Providing input for daily reports.

The PQCM resume is provided in Attachment 2.

Site Safety and Health Officer

The SSHO will fulfill the duties and responsibilities as defined in corporate procedures. This individual will have completed the 30-hour OSHA construction safety class or equivalent. The SSHO has a minimum of 5 years of construction experience and has had 24 hours of formal health and safety training in the last 4 years. The SSHO reports to the PESM and assists with the implementation of Tetra Tech's Environmental Health and Safety (EHS) programs and procedures. The SSHO helps to ensure that operations are performed in compliance with applicable client- and site-specific requirements and government regulations. The SSHO shall be responsible for the following:

- Ensuring that Tetra Tech employees and subcontractors understand the requirements of the Tetra Tech EHS program and procedures through training and communications.
- Assisting with implementation of the APP/SSHP.
- Conducting daily EHS briefings in accordance with Corporate Procedures.
- Conducting daily informal inspections of the project site and recording observations in the logbook.
- Updating the Safety and Health Deficiency Log on a daily basis.
- Assisting the FOL with weekly health and safety inspections. Ensuring corrective actions identified are being addressed and corrected.
- Exercising stop work authority when warranted by conditions, in accordance with the project plans.
- Ensuring that Tetra Tech site personnel have received required EHS regulatory and program training, in accordance with Corporate Procedure Training.

- Supporting the Task Order Manager in accident and incident investigations.
- Functioning as a technical resource for all environmental, safety, loss control, and industrial hygiene issues.
- Ensuring that the specific responsibilities for EHS personnel identified in the Tetra Tech EHS Programs and the EHS plan(s) are fulfilled.
- Performing on-site monitoring to determine appropriate levels and use of personal protective equipment (PPE).
- Performing site surveillances, hazard identification, and health risk analysis.
- Implementing procedures and programs to eliminate risk to site personnel, including initiating changes to the plan.
- Acting as EC when the FOL is not immediately available on site.
- Implementing site control measures.
- Maintaining the field health and safety logbook.
- Providing summaries of field operations and progress to the PESM.

Project Environmental and Safety Manager

The PESM has the responsibility and authority to oversee the development, revision, and approval of SSHPs and to audit the equipment and training of involved company and subcontractor employees to implement the plan. The PESM is also responsible for reviewing health and safety issues that may arise during the project, approving SSHO assignments and project responsibilities, coordinating changes in PPE requirements with the SSHO, conducting major accident investigations, and performing periodic site audits and inspections. The PESM or designee has discretionary authority to shut down field operations. Projects may not start until the PESM and the Navy have approved the project plans.

4.3 COMPETENT PERSONS

There are no anticipated project tasks (e.g., excavation and trenching, rigging) that specifically require a Competent Person to be designated. However, the SSHO Mark Ladd is the competent person for the anticipated health and safety related issues that may arise on the project. Mr. Ladd has the experience and training required for this project as evidenced by his years of experience in providing health and safety and UXO oversight on numerous

projects and his formal academic training in OSHA Construction Safety (30-hour), Hazardous Waste Site Operations (40-hour), HAZWOPER Site Supervisor (8-hour), and Environment Safety Supervision (30-hour TtEC training). Training certifications are provided in Attachment 3.

4.4 REQUIREMENT OF COMPETENT PERSON OVERSIGHT

Although the SSHO is competent to provide general health and safety oversight on the project as specified above, he is not qualified to act as a competent person for all other specialized tasks specifically regulated by OSHA and WISHA (such as confined space entry and handling certain regulated substances) that require oversight from specially trained health and safety professionals who are knowledgeable in these matters and authorized to implement corrective measures as needed. Although these specialized tasks are not currently part of this project, if they become necessary, this APP/SSHP will then be amended to include the names and qualifications of individuals who, by virtue of their specialized training and experience, are competent to provide health and safety oversight of these activities. No work will be performed unless a designated competent person is on site for any work that requires a competent person as required by OSHA and WISHA or the EM 385-1-1.

4.5 PRE-TASK SAFETY AND HEALTH ANALYSIS

Before work begins on the project, all major field activities will be evaluated for health and safety hazards. This analysis involves a variety of worksite examinations to identify not only existing hazards, but also conditions and operations where changes could occur resulting in new hazards. The process begins by identifying anticipated hazards based on 1) how the work will be conducted and assigned resources, and 2) environmental conditions. Corrective measures are then incorporated into the scope and applicable work plans (i.e., the APP/SSHP and the Work Plan). Tetra Tech requires workers to immediately notify their supervisor of unsafe conditions and openly encourages workers to make suggestions at any time during the work.

Just prior to mobilization, an Operational Readiness Review is conducted by project management staff to ensure all needed resources, personnel, and plans are available for the work. Site hazards are also reviewed and corrective measures are discussed. Any deficiencies noted during this review are promptly addressed before work begins.

Health and safety analysis is also achieved through regular inspections of the job site as described in Section 7.0 of this APP.

4.6 LINES OF AUTHORITY

The TOM, Angie Peace, reports directly to Tetra Tech's Program Manager, Dr. Chris Soucier, and indirectly to the Navy's RPM. Angie Peace has designated Laura Miller as her FOL to assist her in the day-to-day implementation of the site safety program. Barbara Leonard has been designated as the PQCM and will be responsible for the day-to-day implementation of the project QC program and in this role reports to the Program QC Manager Brad Schaeffer. Mark Ladd has been designated as the SSHO and UXO technician for this project and reports to the PESM Heidi Raymer and the UXO Safety Manager Ralph Brooks in these roles. These individuals and their aforementioned lines of authority are shown in the organization chart in Figure 4-1.

4.7 NON-COMPLIANCE SAFETY REQUIREMENTS

Compliance with the safety and health requirements described in this APP and the Work Plan is expected of all personnel working on the projects. When lapses in compliance occur with a given individual or individuals, the FOL will attempt to resolve the issue by discussing the problem with the individual directly by stating clearly the nature of the deficiency and the steps needed to correct it. These corrective actions will be written into the site logbook with completion dates specified as appropriate. The FOL will then monitor the worker's performance to ensure the problem has been corrected. If compliance problems continue, a graded disciplinary approach will be taken, which may involve a letter of reprimand issued to the worker, suspension, loss of pay, or removal from the project.

If the noncompliance issue involves failure to correct an unsafe condition or implement a required safety and health control, the problem will immediately be brought to the attention of the FOL for resolution. All personnel working on site are expected to participate in this hazard notification process. Once the issue has been disclosed, an investigation will be conducted by the FOL and SSHO/PQCM to evaluate the deficiency and correct it. Their findings and corrective actions will be noted on an Incident and Investigation Report form or Quality Incident Report form, or both (included in Attachment 4 to this APP), and submitted to project management for review. Immediate correction of the unsafe condition or control will be done if possible. Otherwise, the problem will be isolated, site personnel will be informed, and a corrective action schedule with completion dates will be assigned until the issue is resolved.

4.8 MANAGEMENT ACCOUNTABILITY

To ensure project management is held accountable for their safety and health performance on this project, the Program Manager and senior management will regularly conduct reviews of project performance. They will evaluate the nature of all incidents occurring on each project and provide direct feedback to the TOM on the adequacy of their approach to managing safety and health risks. Methods and means for improving or rewarding safety and health performance will be discussed as appropriate.

Tetra Tech's executive management conducts quarterly program reviews with the Program Manager. The review includes a detailed discussion on safety and health performance during the previous quarter, the quantity and types of incidents that occurred, and actions taken to improve safety performance. The executive team evaluates the nature of all incidents occurring on the project and provides direct feedback to the Program Manager on managing health and safety risks and improving safety and health performance. Methods and means for improving or rewarding safety and health performance are discussed as appropriate.

Tetra Tech executive management holds project managers and supervisors accountable by having them participate in Environmental Safety and Quality Review Board meetings, as applicable. During these sessions, management reviews select safety and health incidents occurring at the job site, offers insights on lessons learned, and suggests better approaches for correcting any underlying deficiencies, as needed. The program also provides numerous mechanisms for involving project managers and supervisors in the administration of the site safety and health program. As indicated, project management directly participates in scheduled site inspections, reviews all accident/incident reports and investigations, reviews all quality incident reports, ensures action items from incident reports are completed, and approves all changes to this APP/SSHP.

Finally, safety and health performance is a specific performance category in each Tetra Tech associate's performance evaluation.

4-9

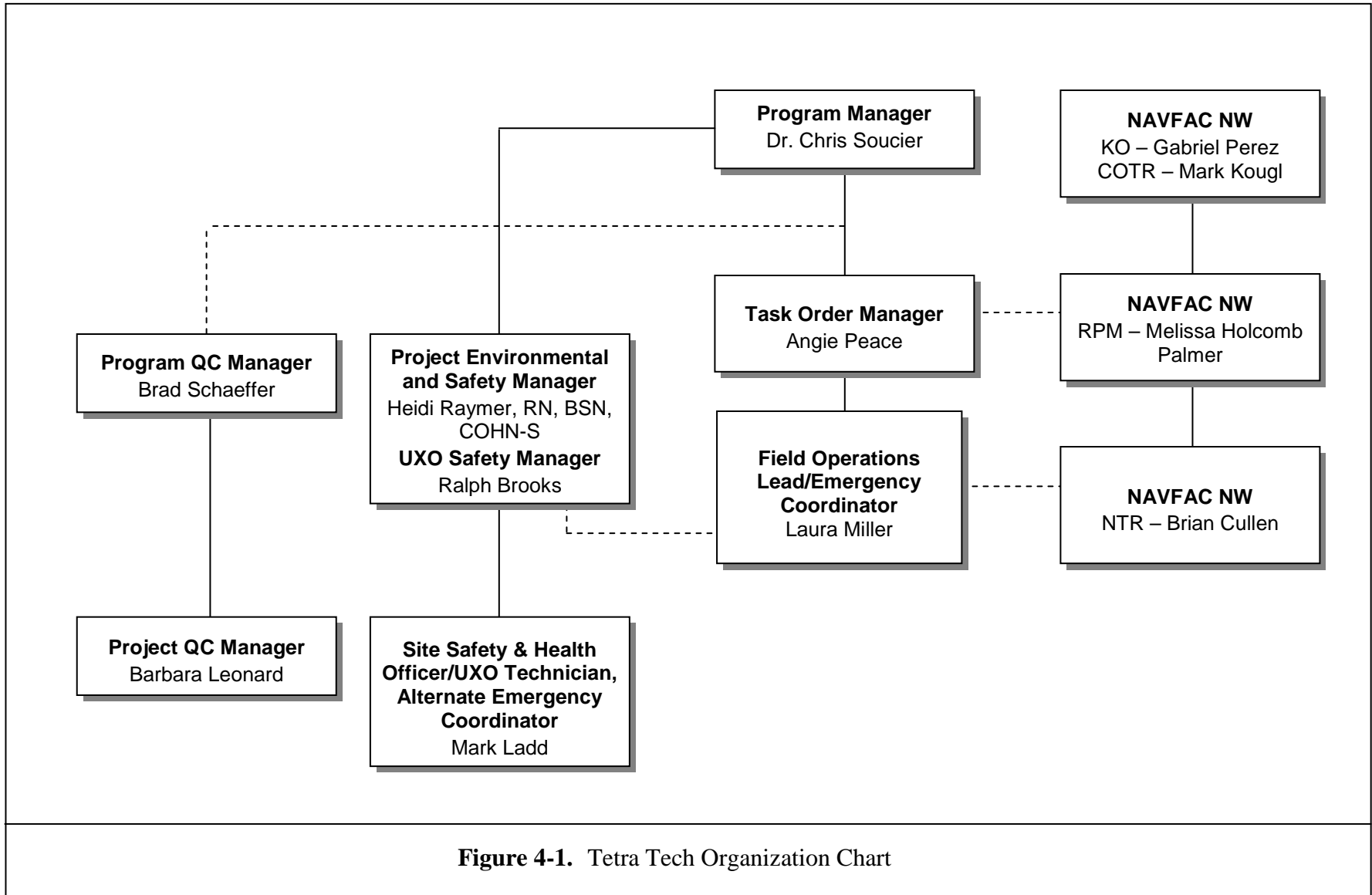


Figure 4-1. Tetra Tech Organization Chart

5.0 SUBCONTRACTOR AND SUPPLIERS

5.1 IDENTIFICATION OF SUBCONTRACTORS

Subcontractors working on this project include:

- Contract Laboratory – To Be Determined
- Others – To Be Determined

5.2 SAFETY RESPONSIBILITIES OF SUBCONTRACTORS

All subcontractors working on this project are required to comply with site-specific work rules (see Attachment 5), APP/SSHP requirements, applicable Tetra Tech policies and procedures, vendor contract requirements, state and federal worker health and safety regulations, and client-specified project requirements. Subcontractors performing high-incident potential work will be approved by the PESM prior to starting work in accordance with Tetra Tech procedures. All subcontractors are responsible for ensuring their work activities are conducted in a safe and healthful manner in accordance with the above-mentioned standards and directives. They are expected to participate in all scheduled health and safety meetings and training sessions and be available for routine safety and health audits and inspections. They must also report all unsafe conditions and behaviors, loss, damage, and injury events to the FOL.

The FOL will direct the activities of all subcontractors working on site and monitor their compliance with this APP/SSHP. Problems with compliance will be communicated directly to subcontractor management for resolution. Subcontractor personnel must comply with the training and medical requirements specified in the APP and provide documentation of same for the project files. No subcontractor will be allowed to work on site until their medical and training documentation file is complete.

6.0 TRAINING REQUIREMENTS

6.1 NEW HIRE SAFETY AND HEALTH ORIENTATION TRAINING

All project personnel, including new hires, will receive site-specific orientation training consisting of the following topics before they will be allowed to work at the site:

- The content of this APP and SSHP
- Potential site hazards (chemical, physical, and biological) and the means to control or eliminate them, including applicable Activity Hazard Analyses (AHAs)
- Hazard communication for chemicals brought onto the site
- Selection, use, and limitations of required PPE
- Emergency response procedures including emergency medical protocols
- Bloodborne pathogen briefing
- Employee and supervisor responsibilities for reporting all accidents and near misses
- Requirements and responsibilities for accident prevention and the maintenance of a safe and healthful work environment
- Procedures for reporting and correcting unsafe conditions and practices
- General safety and health policies and procedures
- Project Orientation, Rules, and Safety Guidelines Handbook
- Subcontractor safety orientation video

This site-specific training will be documented in writing by date, name, content, and trainer, and will be maintained on file at the job site (see Attachment 4).

6.2 MANDATORY TRAINING AND CERTIFICATIONS

The former LHTR is considered a munitions response site that is known to have MEC/MPPEH contamination. Although MEC/MPPEH may be present, there will be no handling of any MEC/MPPEH allowed and there will be no excavation performed in any area where metallic anomalies are indicated by handheld metal detectors. Because of the risk that MEC poses to workers, the site workers will be briefed by the UXO technician on UXO awareness and will be escorted at all times when inside the LHTR. In addition, the FOL and SSHO must have completed first aid/cardiopulmonary resuscitation (CPR)/bloodborne pathogen training. The wetlands delineation and characterization personnel will be escorted by a qualified Level III UXO technician providing MEC avoidance using handheld metal

detectors following established procedures that are included in Section 3.4 of the Work Plan. The UXO technician is qualified in accordance with DDESB TP-18 as a Level III technician.

Chemical contamination, although very unlikely, may be possible in some areas; however, the LHTR has been recommended for no further action following several studies to evaluate site contamination. Exposure to the contaminants is not anticipated to occur based on prior investigation sample data and the nature of the work being performed during this project which will not present opportunity for routes of exposure. All excavations performed for the collection of soil samples and to delineate the wetlands on site are limited to 18 inches in depth. The samples are not being collected to determine or delineate chemical contamination; rather, they are collected for the purpose of determining wetland boundaries and potential acidifying action from sulfide and sulfate that could occur during future intrusive investigation and removal activities. There will be no excavations in areas where metallic signatures are detected by the handheld magnetometer during MEC avoidance. As such, there will be no need for establishing site chemical or other hazard control zones or having any formal decontamination station for this work. In addition, there is no need for site workers to have completed 40 hours of hazardous waste operations training, as required by 29 CFR 1910.120/1926.65 and WAC 296-800-843.

The SSHO will also have completed OSHA's 30-hour construction safety course. Each subcontractor supervisor and at least one other company site worker will have current first aid/CPR/bloodborne pathogen training. All other site workers will receive the orientation training described above. They will also participate in pre-activity safety briefings and tailgate safety meetings. Specialty contractors such as electricians and equipment operators, if used, must also be familiar with the training, certification, and experience requirements applicable to their own trades, and must be current with respect to these requirements. Copies of site personnel certifications are included in Attachment 3.

The names and phone numbers of all first aid/CPR-qualified site personnel (minimum of the FOL and SSHO) will be on file and immediately available to field personnel on a clipboard maintained with the SSHO at all times. A copy of the names and numbers will also be maintained in the project vehicle. The aforementioned training requirements and other mandatory training and certifications required for this project are listed below:

Personnel

Requirements

All General Site Workers

Site-specific orientation training, including UXO awareness. General Site Worker training requirements.

Site Safety and Health Officer

First aid/CPR training plus OSHA's 30-hour Construction Safety course. General Site Worker training requirements.

MEC Avoidance Escort

UXO technician Level II or III, qualified in accordance with DDESB TP-18.

One worker, in addition to SSHO

First aid/CPR and Bloodborne Pathogens.

Users of portable fire extinguishers

OSHA-compliant fire extinguisher education (29 CFR 1910.157[g]).

Users of hearing protection

OSHA hearing conservation program and hearing protection and those enrolled protector use training (29 CFR 1910.95[i],[k]).

6.3 PERIODIC SAFETY AND HEALTH TRAINING

In order to remain current with respect to 30-hour Construction Safety training, the SSHO will receive 24 hours of formal health and safety training every 4 years. The SSHO and FOL will also receive 8 hours of Annual Refresher training as per 29 CFR 1910.120(e), WAC 296-843-200 to maintain their 40-hour General Site Worker certification. As mentioned, all project personnel will receive site orientation training at the start of work. This training will be repeated as necessary whenever work activities and site conditions change.

6.4 EMERGENCY RESPONSE TRAINING

The emergency coordinator for this project is the FOL and the alternate emergency coordinator is the SSHO, as shown in Figure 4-1. Personnel on this project have not been trained as hazardous material responders and incident commanders; therefore, they will not respond to off-site releases of hazardous materials, structural or major fires, or other catastrophic incidents beyond their training and competency. Training during initial orientation, as well as periodic drills and reviews, will include emergency plan training (see Section 9.0 of this APP) and the following:

- Employee alarm system.
- Evacuation procedures, routes, meeting places, and accountability.
- Control of fuel sources.

- Fire extinguisher education (no employee is permitted to attempt to fight a fire beyond incipient stage).
- First aid, CPR, bloodborne pathogens for designated personnel.
- Minor spill control/cleanup on site in accordance with the plan. This may include source control (e.g., shutoffs, repositioning containers), containment (e.g., drum overpacks, sorbent booms, earthen dikes), and non-emergency cleanup (e.g., sweeping, digging, pumping and containerization of spills and residues).
- Rescue operations as necessary.

7.0 SAFETY AND HEALTH INSPECTIONS

7.1 INSPECTION RESPONSIBILITIES

The SSHO or PQCM will conduct informal daily inspections of the job site. The results of these inspections will be reported in the safety and health logbook and daily production report.

Safety and health inspections of the job site will also be conducted and documented each week by the FOL with the support of the SSHO in accordance with Tetra Tech's EHS 3-3 Procedure. Copies of these completed checklists (Attachment 4) will be maintained on file at the job site and will be available to the PESM for review.

Deficiencies noted during these inspections will be corrected promptly and communicated to all workers during the daily briefing to reduce the chance of reoccurrence and make all personnel aware of the findings. Deficiencies will be updated daily and tracked as required by Section 01 A 12 d, EM 385 1-1. Each deficiency will be corrected by a designated authority according to a pre-assigned completion date listed on the inspection form.

Because this project is not anticipated to occur over an extended duration of several months, the PESM (or qualified designee) may not conduct a comprehensive safety and health program inspection of the job site. These inspections, when performed, evaluate the overall effectiveness of the APP/SSHP and assess compliance with applicable OSHA and WISHA regulations and corporate EHS procedures. A PESM inspection form, also part of Tetra Tech's EHS 3-3 Procedure, will be used to document these audits, if performed. Copies of the inspection findings will be sent to the TOM and FOL for evaluation and correction of any deficiencies.

7.2 EXTERNAL INSPECTIONS

External inspections of the job site are not required nor are they anticipated to occur. If personnel from an external agency arrive at the project site seeking entry, they will be referred to the NTR. The Project Manager and PESM will be notified, and Tetra Tech, as well as subcontractor personnel, will participate in the investigation as directed. External inspections will be documented in accordance with corporate procedures.

8.0 ACCIDENT REPORTING

8.1 EXPOSURE DATA

The Task Order Manager will compile the total number of hours worked by all project participants and include this data in a close-out report after the work is completed. This information will be used to calculate, in part, the OSHA recordable rates for Tetra Tech at the end of the fiscal year. Copies of these recordable rates will be made available to Naval Facilities Engineering Command, Northwest (NAVFAC NW) upon request.

8.2 ACCIDENT INVESTIGATIONS, REPORTS, AND LOGS

When an incident occurs, the FOL, assisted by the SSHO and PQCM, will suspend operations and secure and/or evacuate the area. The scene of any fatality, injury involving hospitalization, weight-handling incident, fire/explosion/flash, or property damage exceeding \$20,000 will be secured from disturbance pending investigation and further instruction from the Navy or PESM. The FOL/SSHO will perform an initial accident investigation and document the findings in a report in accordance with Tetra Tech's Event Reporting and Investigation Procedures. All information pertaining to the incident will be recorded (e.g., time, date, location, name and company of persons(s) involved, witnesses, description of event, and actions taken). The FOL/SSHO will be assisted as necessary in the investigation, causal analysis of the event, and action plan development by the PESM. A copy of the Event Report and Investigation form is included in Attachment 4. Reports are entered online into Tetra Tech's Corporate Incident Database. Notifications are sent through the database via e-mail to responsible managers who review and approve the reports. Incidents that are considered a serious mishap are reported to the Navy as outlined in Section 8.3 below. Based on a causal analysis of the event, corrective actions are specified and implemented to prevent similar incidents from occurring in the future. Notifications of high-loss potential incidents are forwarded to executive management on Tetra Tech's Environmental Safety and Quality Review Board. This board meets weekly via conference call to review selected events with project teams in order to identify lessons learned and recommend improvement opportunities.

All recordable injuries, near-miss incidents, high loss potential incidents, property damage incidents costing more than \$500, first aid cases, and environmental spills (greater than reportable quantity) will be entered on Tetra Tech's Program Incident Database. This database summarizes the accident/incident history of the program from the start of the contract and on a year-to-date basis.

8.3 NOTIFICATIONS

Minor injuries and near misses will be reported to the NTR, RPM, TOM, and PESM by telephone and e-mail within 24 hours and will be documented on the weekly production/QC Report.

The NTR, RPM, TOM, and PESM will be notified immediately of any serious mishap or incident that occurs during the field work for this effort. Serious mishaps require both immediate notifications via telephone and follow-up reporting, and are defined as:

- An injury or illness that:
 - involves an exposure to a hazardous substance above the PEL;
 - meets the OSHA recordable criteria;
 - results in permanent total or partial disability;
 - results in one or more worker hospitalizations; or
 - results in a worker fatality.
- An injury or unexpected chemical exposure to a client or a member of the public
- Any material or weight-handling incident or near miss including overturned crane, collapsed boom, dropped load, or damage to a crane or adjacent property
- Any property damage greater than \$20,000
- A fire, explosion, or flash
- Safety-related events reported by an enforcing authority or client
- External regulatory inspections that result in findings or citations
- A permit exceedance
- Any event that could result in adverse public media interest

In the event one of the above conditions is met and requires immediate reporting to the Navy, the following process will be followed:

1. The scene of any fatality, injury involving hospitalization, weight-handling incident, fire/explosion/flash, or property damage exceeding \$20,000 will be secured from disturbance pending investigation and further instructions from the Navy and PESM.
2. Tetra Tech will make a verbal report to the NTR as soon as possible, or within 2 hours, with as much information as is available at that time.

3. The NTR will complete the Heads-Up Initial Mishap Notification for internal Navy notification.
4. The NTR will enter contractor data into the Contractor Information Reporting System (CIRS) module in Enterprise Safety Applications Management System (ESAMS) within 8 hours.
5. A hyperlink and password will be sent to the Tetra Tech TOM with instructions for completing the Contractor Safety Incident Report (CSIR) via ESAMS.

In addition, appropriate federal or state OSHA agencies will be notified by the PESM within 8 hours of any fatality or hospitalization. In the state of Washington, employers must report to the Department of Labor and Industries within 8 hours the death, probable death, or the in-patient hospitalization of any employee due to an on-the-job injury by calling 1-800-423-7233.

9.0 PLANS AND PROCEDURES REQUIRED BY THE USACE SAFETY AND HEALTH REQUIREMENTS MANUAL

This section provides a listing of plans and procedures that may or may not apply to the project as required by Section 9 of Appendix A in EM 385-1-1. Those that do apply have also been included in this section after the listing of plans. Those that do not apply are designated as “N/A” in the listing to indicate they are not applicable.

Listing of Plans and Procedures

- a. Site Layout Plans: Section 9.1
- b. Emergency Response Plans: Section 9.2
 - (1) Procedures and Tests: Section 9.2.1
 - (2) Spill Plans: Section 9.2.2
 - (3) Firefighting Plan: Section 9.2.3
 - (4) Posting of Emergency Telephone Numbers: Section 9.2.4
 - (5) Man Overboard/Abandon Ship: N/A
 - (6) Medical Support: Section 9.2.5
- c. Plan for Prevention of Alcohol and Drug Abuse: Section 9.3
- d. Site Sanitation Plan: Section 9.4
- e. Access and Haul Road Plan: Section 9.5
- f. Respiratory Protection Plan: N/A
- g. Health Hazard Control Plan: Section 9.6
- h. Hazard Communication Program: Section 9.7
- i. Process Safety Management Plan: N/A
- j. Lead Abatement Plan: N/A
- k. Asbestos Abatement Plan: N/A
- l. Radiation Safety Program: N/A
- m. Abrasive Blasting: N/A
- n. Heat/Cold Stress Monitoring Plan: Section 9.8
- o. Crystalline Silica Monitoring Plan: N/A
- p. Night Operations Lighting Plan: N/A
- q. Fire Prevention Plan: Section 9.9
- r. Wild Land Fire Management Plan: 9.10

- s. Hazardous Energy Control Plan: N/A
- t. Critical Lift Plan: N/A
- u. Contingency Plan for Severe Weather: Section 9.11
- v. Float Plan: N/A
- w. Site-Specific Fall Protection and Prevention Plan: N/A
- x. Demolition Plan: N/A
- y. Excavation/Trenching Plan: N/A
- z. Emergency Rescue: N/A
- aa. Underground Construction Fire Prevention and Protection Plan: N/A
- bb. Compressed Air Plan: N/A
- cc. Formwork and Shoring Erection and Removal Plans: N/A
- dd. PreCast Concrete Plan: N/A
- ee. Lift Slab Plans: N/A
- ff. Steel Erection Plan: N/A
- gg. Site Safety and Health Plan for Hazardous, Toxic, or Radioactive Waste (HTRW) Work: Attachment 1, SSHP
- hh. Blasting Safety Plan: N/A
- ii. Diving Plan: N/A
- jj. Confined Space Program: N/A

As noted above, the following site-specific plans have been developed and are included in the following sections.

9.1 SITE LAYOUT PLAN

The former LHTR is located about 20 miles south of NAS Whidbey Island and one mile north of Greenbank, immediately west of State Route 525. Lake Hancock is approximately 423 acres in size. Vegetated wetlands cover roughly 33 percent of the site. The site is fenced on the east side with locked gates but is accessible from the beach and trespassers have been known to enter the site for hiking and hunting. The site is not actively patrolled by base security. The site access is difficult and is best accomplished at low tide. Tetra Tech project personnel will access the site via one of three locked gates or access via the beach. There will be no field office established for this project. Personnel will drive to the closest safe location and park and walk to various locations to conduct the wetlands delineations and impact studies. See Figure 9-1 for the site layout.

9.2 EMERGENCY RESPONSE PLAN

The only chemical products that are anticipated to be used to support the fieldwork include the sample preservative zinc acetate. Although lead may be present in some soils in locations on site, chemical hazard exposures are not likely to occur and are addressed further in the SSHP (Attachment 1). UXO hazards exist on at the former LHTR and should inadvertent detonation of UXO occur, the explosion could cause severe injury or death to personnel and wildland fires could also be triggered by the explosion. Other physical hazards exist at the former LHTR that present the risk of injury and illness such as slips, trips, and falls, drowning hazards, potential for severe weather, heat or cold stress emergencies. Biological hazards such as contact with poisonous plants and hazardous wildlife also exist. Any of these scenarios have the potential for requiring site evacuation and emergency response. Because personnel will be on foot for much of the fieldwork, access to the site vehicle for evacuation may take longer and providing assistance to a severely injured or medically impaired party may require outside assistance.

The Emergency Response Plan shall be rehearsed at the start of the project. The rehearsal will include a drill scenario using a staged personnel injury or wildland fire. At the completion of the exercise, the FOL and SSHO will evaluate the effectiveness of these emergency response procedures and make appropriate corrections to this plan. Results of the exercise will be documented, and suggestions and comments will be annotated in the safety logbook and Daily Report. The Emergency Response Plan will be modified to include any changes necessary. Any changes will be coordinated with the Task Order Manager, the PESM, and the Navy through the DCN process. Table 9-1 provides a listing of emergency response contacts.

Emergency Equipment

Tetra Tech will supply and maintain all protective clothing and emergency equipment required by its crews. Basic emergency and first aid equipment is listed in Table 9-2. The location of emergency equipment will be in the project vehicle when personnel are not performing fieldwork. The emergency and first aid equipment will be maintained in a portable manner to be carried into the field with the field crew so that it is immediately accessible when project personnel are not at the vehicle.

Table 9-1. Emergency Contact List

Ambulance	
Emergency	(360) 257-9999
Hospital: Whidbey Island General Hospital	(360) 678-5151
Fire	
Emergency	(360) 257-3333
Business	(360) 257-2897
WorkCare	1-800-455-6155
Poison Control	1-800-222-1222
Naval Base Emergency Response Team	(360) 257-9646
U.S. Coast Guard	(360) 417-5840
Navy NTR, Brian Cullen	(360) 531-3997 (cell phone) (360) 396-0083 (office phone)
Navy RPM, Melissa Holcomb Palmer	(360) 315-5420
Navy Contracting Specialist, Gabriel Perez	(360) 396-1861
Tetra Tech Task Order Manager, Angie Peace	(909) 569-7139 (716) 849-9419 (office phone)
Tetra Tech UXO Safety Officer, Ralph Brooks	(770) 413-0965 (office phone) (404) 661-4916 (cell phone)
Tetra Tech PESM, Heidi Raymer	(703) 447-8244 (cell phone)
Tetra Tech FOL, Primary EC, Laura Miller	(503) 721-7218
Tetra Tech SSHO/UXO Technician, Alternate EC, Mark Ladd	(770) 413-0965
Tetra Tech PQCM, Barbara Leonard	(314) 322-4582

Table 9-2. Type and Location of Emergency Equipment

Equipment	Location
First Aid Kit with Bloodborne Pathogens Kit	Support Vehicle and On Person during fieldwork
Fire Extinguisher (10-pound, type ABC)	Support Vehicle
ANSI-Approved Emergency Eye Wash	Support Vehicle
Air Horn	Support Vehicle and On Person during fieldwork
Spill Kit	Support Vehicle
Cellular Telephone	Minimum of FOL and SSHO

Emergency Coordinator

Tetra Tech has assigned responsibility for implementation of this Emergency Response Plan to an EC who for this project is the FOL, Laura Miller. The alternate EC, should the FOL be unavailable or involved in the emergency itself, is the SSHO Mark Ladd. The EC is responsible for ensuring the evacuation, emergency treatment, and emergency transport of site personnel (as necessary), and notifying emergency response units, the Navy, and the appropriate Tetra Tech management staff.

The EC will conduct an inspection of emergency response equipment prior to site mobilization. This equipment includes fire extinguishers, first aid kits, communication equipment, and the spill kit. As part of the daily site walk-through, the EC shall pay close attention to potential fire hazards and conditions, potential for severe weather to occur, and individual work practices that could lead to an injury. The emergency response equipment will be stored in the site vehicle, and first aid/CPR equipment as well as communication equipment (emergency contact numbers, cellular telephones, and air horn) shall be carried into the field when fieldwork is being performed so that it is immediately available for use in the event of an emergency.

9.2.1 Procedures and Tests

Pre-Emergency Planning

During the site orientation, and during daily site briefings as necessary, all site workers will be informed of this emergency response plan, communication systems, and evacuation routes. The plan will be reviewed and revised, if necessary, on a regular basis by the SSHO.

An air horn sounded with one long blast will be used to alert site personnel in the event of an emergency (as necessary). The work team will have access to an air horn in each designated site vehicle and on the SSHO when in the field. See also Section 10 of the SSHP.

Evacuation Routes

In the event of an emergency that necessitates an evacuation of the site, the following procedures will be implemented:

- One long blast on the air horn will be the signal to evacuate the site immediately if necessary (verbal notice is likely to be sufficient).
- All personnel will evacuate upwind of the site to a predetermined assembly where a head count will be taken. The assembly area for each work location will be determined by the SSHO, and all personnel will be informed of the assembly area location during the morning safety meeting. Personnel will remain at that area until the EC provides further instructions.
- Once everyone on the team has been accounted for in that assembly area, personnel will evacuate further to a safe area and the EC will assess the situation and outline the actions to be taken.

Communication of evacuation routes and assembly points shall occur initially and daily as necessary (depending on work locations) during the tailgate safety briefing.

In the event of an emergency situation, the EC shall immediately do the following:

- Establish the safety of all personnel and direct the administration of first aid as appropriate;
- Shut down all combustion equipment (if any is operating) if safe to do so;
- Notify 911 and provide the exact location of the affected area or personnel;
- Prohibit outside personnel from entering the affected area until emergency personnel arrive and evacuate the area completely if the situation presents an immediate threat;
- Provide emergency equipment as appropriate; and
- Notify Navy RPM and NTR, Task Order Manager, and PESM, if not already notified.

9.2.2 Spill Plans

Environmental Incident (Spill)

There is a very limited potential for spills to occur on this project because other than the site vehicle, there is no equipment being used that contains fuel or oil. It is unlikely for a spill to occur on this project; however, basic spill procedures have been prepared and are included in this section should a spill occur. Absorbent materials will be kept in a bag behind the seat in the site vehicle in the event of a spill of fuel from the site vehicle. The Environmental Protection Plan section of the Work Plan contains Spill Prevention Best Management Practices that will be employed during the project to minimize the chance or severity of spills during this project.

All containers used on site (e.g., spray paint, sample preservation chemical zinc acetate) will be labeled identifying its contents and associated hazards. Material Safety Data Sheets (MSDSs) for hazardous chemicals used on site will be kept in a binder in the project vehicle. All containers will be constructed with closeable lids, which will be kept closed except when in direct use. All project wastes (anticipated to consist only of used sample gloves, disposable sample scoops, and common trash lunchroom type wastes—all nonhazardous) will be bagged and kept from littering the site and disposed of as common trash in an approved dumpster at the end of the day.

Non-emergency Spills

Non-emergency spills are defined as a discharge of a known material or non-reportable quantity (non-RQ) hazardous substance to the land (not surface water) that can be cleaned up by Tetra Tech without posing an immediate threat to human health or the environment.

For a non-emergency spill, Tetra Tech workers will perform the following procedures:

- Stop the source of the spill if safe to do so.
- Contain the spill by keeping it away from drains or waterways and blocking off drains located near the spill if there is a chance the spill will reach them.
- Notify the FOL.
- Clean up and contain the spilled material while wearing the proper PPE as designated by the SSHO in accordance with the SSHP.
- Notify the NTR, RPM, and TOM for proper spill cleanup materials disposal.

Once procedures to address the immediate concerns above are underway, the supervisor will notify the NTR or RPM and the TOM (see Table 9-1). Tetra Tech will assist the Navy in determining whether any agency notifications are required.

Emergency Spills

An emergency spill is defined as any release that poses an immediate or imminent threat to human health or the environment, any release that exceeds the RQ for a hazardous substance, any release into any waterway including storm drain or other conveyance to a waterway, or a release that requires the assistance of non-Tetra Tech personnel or equipment to be contained or mitigated.

For an emergency spill, Tetra Tech workers will perform the following procedures:

- For an immediate or imminent threat to human health or the environment, immediately evacuate to a safe location upwind and call 911. If it is necessary to travel to a telephone to contact 911, designate a person to do so and make sure that person informs emergency response as to the nature of the emergency, the location of the emergency, and any other hazards. In this case, do not take action to mitigate the spill unless it is safe to do so, you are cleared to do so by emergency services and the SSHO, and the proper course of action has been determined. If anyone is injured, follow directions in this APP to assist injured personnel.

- If the situation is not an immediate threat to human health or the environment, and if you can safely do so, stop the source of the spill if you are able and take appropriate immediate actions to minimize potential for spill migration, then evacuate to a location upwind.
- Notify your supervisor, who will then notify the SSHO.
- If others are in the area, warn them and direct them to a safe location upwind.
- As soon as the immediate emergency actions are implemented, the supervisor will notify the NTR, the RPM, the TOM, and the PESM, and a course of action will be discussed (see Table 9-1 for a telephone list for internal spill contacts).
- Once the course of action is decided and participating personnel are adequately protected, cleanup actions may commence (which may be limited) under direct supervision of the SSHO in accordance with the SSHP.
- Tetra Tech will assist the Navy in making notifications to regulatory agencies or to request outside agency response personnel as necessary. The Navy will either notify outside agencies of the discharge or direct Tetra Tech to make the initial notification if agency notification is required.

9.2.3 Firefighting Plan

Workers will not fight any fires other than incipient stage fires. All work will be performed outdoors and the most likely fire scenario is a wildland fire (see Section 9.11 below) not caused by project activities. As stated in the Fire Prevention Plan (Section 9.10), there will be a minimum of one 10-pound ABC dry chemical fire extinguisher staged in the project vehicle. The fire extinguishers are intended to fight only fires that have recently occurred and can be reasonably extinguished immediately. Fire extinguisher use will be discussed during the safety brief. In no case will workers attempt to fight any fire that cannot be reasonably extinguished within 30 to 60 seconds. The fire extinguishers have enough agent for small fires only.

All extinguishers will be inspected by the site SSHO on a monthly basis (at a minimum). Additionally, all fire extinguishers will be inspected and serviced annually by a qualified professional. Any defective or partially used fire extinguisher will be red-tagged and taken out of service until such time that it can be serviced. Fire extinguishers will be secured or supported when transported and in storage.

Prior to fighting any fire or during the course of fighting a fire, call 911 and follow the procedures in Section 9.2, Emergency Response Plan. Initiate fire suppression with fire

extinguishers (incipient stage only) in a safe manner and only if determined safe to do so. The person reporting the fire is required to provide the following information:

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

9.2.4 Posting of Emergency Telephone Numbers

A copy of this Emergency Response Plan, Figure 9-2 showing the route to the Whidbey Island General Hospital in Coupeville, and Table 9-1 listing emergency response contacts will be posted in a site work vehicle and be maintained in all Tetra Tech and site subcontractor vehicles at all times, and one copy will be with each field team when performing fieldwork that is not in sight of the project vehicle.

The following information from the Emergency Response Plan shall be highlighted:

- Emergency telephone numbers for fire, ambulance, hospitals, and police.
- Name and telephone number of the PESM, Task Order Manager, EC, SSHO, and Navy personnel.
- Location of fire extinguishers and emergency equipment.
- Map to the hospital and emergency routes.

9.2.5 Medical Support

Tetra Tech uses a network of clinics and hospitals that are arranged by its Workers Compensation Insurance and medical provider, Dr. Peter Greaney, WorkCare[®], to provide timely and proper medical care for its employees. The SSHP also describes the medical support program. All personnel assigned to the project must have a current medical certification to indicate fitness for duty, wear all required PPE, and notify the SSHO if there are any work restrictions placed on their employment. The SSHO will maintain this

certificate in the training records file in the project vehicle. The examination must have been performed annually or biennially, depending on the decision of the corporate medical provider of the respective employers.

Mark Ladd, SSHO, Laura Miller, FOL, and Barb Leonard, PQCM, are all qualified in CPR/first aid. Other personnel assigned to the project will be identified and their names posted so that all personnel know who can provide this service.

Personal Injury or Medical Emergency

In the event of serious personal injury (fatality, patient unconscious, possibility of broken bones, severe bleeding that will not stop, severe burns, blood loss, shock, trauma, chest pain, difficulty breathing, seizure, electrocution, disorientation, suspected poisoning), the first responder shall immediately:

- Call 911.
- Administer first aid if qualified; if not qualified, immediately seek out a person qualified to administer first aid.
- Notify the EC of the name of the individual involved, their location, and the nature of injury.
- Upon notification of a serious personal injury, the EC shall immediately:
 - Notify emergency services (911) if not already notified and give the appropriate patient information and their location;
 - Determine whether ambulance transport is possible or if self-transport to the hospital is required;
 - Assist the injured party as deemed appropriate;
 - Provide a copy of the injured party's medical data sheet to responding medical personnel or directly to the Whidbey Island General Hospital if self-transporting;
 - Accompany or designate someone to accompany the injured party to the hospital;
 - Call WorkCare, (800) 455-6155;
 - Notify the RPM, NTR, Task Order Manager, and PESM if not already notified; and
 - Complete the Incident Report and Investigation form, included in Attachment 4.

- Tetra Tech will make a verbal report to the NTR as soon as possible, or within 2 hours, with as much information as available at that time.
- The NTR will complete the Heads-Up Initial Mishap Notification for internal Navy notification. The NTR will enter the Tetra Tech data into the CIRS module in the ESAMS within 8 hours.
- A hyperlink and password will be sent to the Tetra Tech point-of-contact (POC) with instructions for completing the CSIR via ESAMS. The Tetra Tech POC will enter ESAMS using the hyperlink and password provided in the e-mail and complete the CSIR within 5 days. The CSIR will be sent via e-mail to the NTR for review of minimum requirements. Tetra Tech will provide updates to CSIR as information becomes available.
- The NTR will review CSIR for minimum notification content and resolve any issues or concerns.

In order to prepare for potential injuries during the field activities, the site staff shall familiarize themselves with the Zip Bulletin 108 titled “Improving Injured Worker Case Management.” This should be completed at the daily safety brief on the first day of activities prior to work or during a pre-job meeting.

All serious injuries occurring at the job site will be treated at Whidbey Island General Hospital (telephone: [360] 678-5151). A route map with directions to the hospital is provided in Figure 9-2.

Non-serious injuries such as abrasions, strains, and sprains will be treated on site by first aid/CPR-trained personnel only. These first aid/CPR providers are authorized to stabilize an injured person until emergency medical services arrive and/or transport of the patient to the Whidbey Island General Hospital takes place. These first aid/CPR-trained personnel have the skills to perform an initial assessment of the victim’s injuries, open an airway and provide rescue breathing, control bleeding, manually stabilize skeletal and spinal injuries, treat shock, perform an emergency move of the victim, and administer CPR. WorkCare will be contacted to provide medical advice and follow up recommendations. The EC will determine the seriousness of the injury and decide whether the victim should be transported to Whidbey Island General Hospital for treatment.

In the event of a recordable injury, the Navy Basic Mishap Information Requirements form (Attachment 4) shall be completed and forwarded to the NTR. The Tetra Tech Incident Report Forms will be completed and forwarded to the PESH within 24 hours.

Fully equipped Type III first aid kits that meet EM 385-1-1 (Table 3-1) and ANSI guideline requirements will be located in the project vehicle and will be portable for transport on person into the field when conducting work that is away from the site vehicle. They will be inspected weekly and replenished as needed. Because of the potential for contact with poisonous plants, barrier cream (preventative) and soap (wash after contact) will be included in the first aid kit.

Decontamination During Medical Emergencies

Any personnel requiring emergency medical attention shall be evacuated immediately from the work area. Personnel shall not enter the accident scene to attempt a rescue if their own lives would be threatened. The decision whether or not to decontaminate a victim prior to evacuation is based on the type and severity of the illness or injury and the nature of the contaminant.

For some emergency victims, immediate decontamination may be an essential part of life-saving first aid. For others, decontamination may aggravate the injury or delay life-saving treatment. If decontamination does not interfere with essential treatment, it should be performed.

If decontamination can be performed, perform the following:

- Wash external clothing and cut it away.
- Wrap victim in clean blanket or towel if necessary.

If decontamination cannot be performed, perform the following:

- Wrap the victim in blankets or plastic to reduce contamination to other personnel.
- Alert emergency and off-site medical personnel of potential contamination; provide them with MSDSs on chemical contaminants; and instruct them about specific decontamination procedures.

Send site personnel familiar with the incident to accommodate emergency personnel.

9.3 PLAN FOR PREVENTION OF ALCOHOL AND DRUG ABUSE

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

9.4 SITE SANITATION PLAN

Workers will discard all food, debris, and trash into a designated container and packed out each day to the site vehicle. Trash will be emptied once each day and taken to a designated work dumpster at the Area 6 Treatment Facility or suitable alternate location offsite.

A hand washing station will be established at the site vehicle and in the field for hand washing prior to eating or drinking. At a minimum, this station will consist of potable water in a tap dispenser, soap, and paper towels. Sanitary alcohol wipes or gel may also be provided, but not as a substitute for soap and water. A trash bag will also be provided for trash where it can be collected and managed.

An adequate supply of potable water will be maintained available in the project vehicle and on the project team to be available on a daily basis. Disposable cups may be used should the bottled water container be equipped with a tap. Disposable bottled water containers will not be refilled for reuse. Larger containers of potable bottled water will also be available for use as hand washing stations. The SSHO will ensure the field teams carry sufficient water and electrolyte fluids (e.g., Gatorade) into the field. Additional water will be available in the project vehicle for refilling as needed.

Toilet facilities are not present on the work site. There is a gas station, restaurant, and store in the town of Greenbank at 25189 Washington Route 525, which is about 1 mile to the south/southeast, and each of these locations has a public restroom. A site vehicle will be available to access these facilities.

9.5 ACCESS AND HAUL ROAD PLAN

There is no need to build roads and no large deliveries of equipment or materials will occur. The site will be accessed by the field team from either of three locked gate locations at the north, south, and east, whichever is nearest to where the active work will be performed, or is most suitable for access given current tide levels (eastern gate is preferred for higher tide levels). Gate keys and access will be obtained through the NTR from Base personnel. Existing roadways and paths will be utilized to gain access into work locations to the extent possible, though travel through areas without paths or roads is likely to occur and walking will be the primary means of travel within the site. Figure 9-1 shows the site layout. Access may also be achieved by walking the beach and entering from that approach, preferably during low tides. Access routes where bluffs may present a risk of collapse or falls or that restrict egress in the event of an emergency will not be used.

9.6 HEALTH HAZARD CONTROL PLAN

The primary health hazards on this project are hazards associated with potential MEC detonation should contact with these items occur and injuries resulting from slips, trips, and falls, contact with poisonous plants or wild animals, potential for drowning, and exposure to heat or cold stress. In addition, because the public might access this land for hunting, the potential exists for hazards from gun fire during hunting seasons if hunters are present. The SSHP further describes mitigation measures to reduce the hazards relating to MEC and other physical hazards as well as chemical, environmental, and biological hazards.

MEC types used at the LHTR include practice bombs, rockets, pyrotechnics and other small ordnance, including practice bombs (MK 89, MK 76, MK 43 and MK 23); 2.75-inch rockets; 2.25-inch SCARs; 5-inch HVARs; water sand fill bombs (100-pound, 250-pound, and 500-pound); and smokes (MK 25, MK 58 and MK 6). A maximum penetration depth of 10 feet (based on a 500-pound bomb) is expected. During the preliminary assessment site walk in 2006, munitions debris was found in salt pans from the surface to approximately 6 to 8 inches below the water line around the target area, on the beach, and in the surf along the beach. The highest concentration of practice 2.75-inch rocket motors and warheads was recovered from around the target area. It is also possible that the pilots would have overshot the target area during practice bombing, resulting in ordnance items scattered around the target area or further downrange to the west. Several rocket motors were found 900 feet or more from the center of the target, on or just off of the beach. Munitions debris includes practice rocket motors and warheads. Although practice bombs and pyrotechnics were used at the site, spent rocket bodies and tail fin sections were the only items observed during past

site visits. Tetra Tech has prepared an Explosive Safety Submission (ESS) Determination Request in accordance with NOSSAINST 8020.15 *Explosive Safety Review, Oversight, and Verification of Munitions Responses*. It is anticipated that based on anomaly avoidance, the ESS Determination Request will result in a waiver from the full ESS requirements.

Sampling of sediments and surface water, including the former target center, was conducted at the site during a Site Hazard Assessment (SHA) investigation in 1998. Samples were analyzed for several munitions constituents, and none were detected. Only metals were identified as contaminants of concern at the various anomalous areas identified during the SHA investigation. The Navy conducted a removal action during which rusted metal plates associated with an observation tower and nearby contaminated soil were removed. After the SHA and removal action, one confirmation sample slightly exceeded state sediment standards for lead. All other metals were below screening levels after the removal action. A site investigation in 2009 sampled for lead and perchlorate (because perchlorate was not analyzed in previous sampling efforts), and neither were detected. For this project, Tetra Tech has prepared a Sampling and Analysis Plan for the collection of as many as 16 soil samples for analysis of sulfate and sulfide to determine potential acidifying action of intrusive anomaly removal to a depth of 1 foot. Sampling and analysis of this soil is not expected to contain site contaminants and no site contamination is being investigated as part of this project. Sampling activities are not anticipated to pose a chemical exposure route to site workers. Sampling activities will follow established sampling protocols, and good hygiene practices such as hand washing will be performed. Efforts to minimize generation of fugitive dust during excavation will be employed, and nitrile gloves will be worn when sampling.

9.7 HAZARD COMMUNICATION PROGRAM

MSDSs will be maintained on file in the SSHOs files for each chemical product used on the project. These MSDSs will be made available to each employee upon request. The content of the MSDS will be discussed with the employee before they begin work. Workers will be trained to recognize chemical contact hazards in the workplace, the physical properties and health hazards of hazardous chemicals, and the personal protective measures that will be taken to control exposures.

9.8 THERMAL STRESS MONITORING PLAN

Because all of the planned work activities will be conducted outdoors where temperature conditions are unpredictable, there is a risk that workers could develop heat or cold stress.

The likelihood of this occurring depends on environmental conditions, including wind chill, the level of work activity, and the personal control measures that are used to manage heat loads (work/rest cycles, use of clothing and/or cooling devices, hydration, etc.). Appropriate control measures will be taken to manage these thermal stress concerns. For example, the SSHO will monitor ambient temperatures in the work area, track thermal workloads, and determine the need for personal protective and administrative controls. Additionally, all workers will be instructed in the recognition and control of thermal stress symptoms and in the treatment procedures (Tetra Tech program procedure EHS 4-6, Temperature Extremes).

Heat Stress

Workers will also be encouraged to drink small volumes (8 ounces) of water about every 20 minutes when working physical tasks, self-limit their exposures to heat stress conditions, and have co-workers watch for signs and symptoms of heat strain in others. Those who take medications that may compromise normal physiologic functioning will be counseled and monitored for heat strain. Workers will also be encouraged to maintain healthy lifestyles, ideal body weight, and electrolyte balance.

Of particular concern in heat stress monitoring is the use of personal protective clothing, which decreases natural body ventilation and greatly increases the temperature and humidity to the skin. If precautions are not taken, heat stress will progress into a heat-related injury. Heat-related injuries fall into three major categories: heat cramps, heat exhaustion, and heat stroke. A summary of the symptoms and emergency treatment for each are summarized in this section, along with methods to prevent and measure heat stress.

Summary of Symptoms

Symptoms of heat cramps include the following:

- Severe muscle cramps and pain, especially of the upper legs, calves, and abdomen, and occasionally in the arms
- Faintness and dizziness
- Possible nausea and vomiting

Symptoms of heat exhaustion include the following:

- Profuse sweating
- Pale, cool, sweaty skin
- Headache and extreme weakness, fatigue

- Nausea and possible vomiting
- Dizziness and faintness
- Collapse and possible brief unconsciousness
- Body core temperature normal, or may be slightly below normal

Symptoms of heat stroke include the following:

- Oral temperature of 104 degrees Fahrenheit (°F) or higher
- Hot, reddish skin; skin is usually dry
- Headache
- Dry mouth
- Shortness of breath
- Nausea or vomiting
- Increasing dizziness and weakness
- Mental confusion and anxiety; victim may show unusual irritability, aggression, combative agitation, or hysterical behavior
- Convulsions, sudden collapse and possible unconsciousness; all heat stroke victims having varying levels of consciousness, ranging from disorientation to coma

It is important to note that a person can suffer heat stroke without suffering any of the other symptoms prior to collapsing.

Note: The two most reliable and distinct differences between heat exhaustion and heat stroke are presented below:

Heat Exhaustion	Heat Stroke
Skin pale; wet or clammy; cool to touch	Skin flushed (red); may be dry; hot to touch
Oral temperature usually normal	Oral temperature above 104°F

Summary of Treatment

Immediate and effective treatment must be provided to an employee to prevent more serious harm. Treatment measures for each type of heat stress are listed in the following sections:

Heat Cramps

- Remove victim from the hot environment.
- Provide Gatorade (the fluids should be kept reasonably chilled before consumption); allow victim to sip this solution at the rate of one-half glassful every 15 minutes.
- To relieve pain, gently stretch the involved muscle group; gently massage cramps as long as it does not increase the pain or discomfort.
- The victim should avoid exertion of any kind for 12 hours. A victim of heat cramps is prone to recurrence.

Heat Exhaustion

- Remove victim from the hot environment and out of the exclusion zone.
- Lie victim down with feet slightly raised.
- Remove as much clothing as reasonable (especially personal protective clothing); loosen what cannot be removed.
- Apply cold, wet compresses to the skin; fanning will also aid in cooling.
- If the victim is fully alert, allow him/her to drink water or the same solution, at the same rate that was used for the emergency care of heat cramps.
- If the victim vomits, do not give fluids by mouth; immediately transport victim to a hospital (dehydration is the most critical problem in heat exhaustion victim and intravenous fluids will need to be given).
- Take oral temperature every 10 minutes; if the victim's temperature is above 101°F or shows a steady increase, transport victim to a hospital immediately and begin sponging victim off with cool water.

Heat Stroke

- Remove the victim from the hot environment and from the exclusion zone.
- Call for trained emergency medical personnel immediately (911).
- Remove as much clothing as reasonable (especially personal protective clothing); cut clothing with bandage scissors, if necessary, being careful not to injure victim.
- Pour cool water over the victim, avoiding the nose and mouth.

- Fan the victim.
- Place cold packs under the arms and against neck and ankles.
- Wrap victim in a wet blanket.
- Continue a combination of these methods until the oral temperature falls below 103°F (take measures to prevent chilling, if necessary, i.e., use slower cooling if the victim starts shivering).
- Elevate the head and shoulders slightly during cooling.
- Never give the victim anything to drink unless fully conscious and vomiting is unlikely.

Because heat stroke involves the entire body, a number of complications may result, including brain swelling, convulsions, coma, kidney failure, liver failure, high blood pressure, and heart failure. Always transport the victim to a hospital, even if the body core temperature has lowered to near normal.

If visual monitoring indicates that a worker is suffering from excessive heat exposure, or if conditions/PPE requirements warrant, workers will be evaluated for heat strain by monitoring the heart rate, body core temperature, and heat strain symptomology. Excessive heat strain may be marked by one or more of the following measures, and an individual's exposure to heat stress will be discontinued when any of the following occur:

- Sustained heart rate is in excess of 180 beats per minute minus the individual's age in years, for individuals with assessed normal cardiac performance, or
- Recovery heart rate at 1 minute after a peak work effort is greater than 110 beats per minute, or
- Body core temperature—as measured with an infrared ear drum scanner—is greater than 100.4°F, or
- There are symptoms of sudden and severe fatigue, nausea, dizziness, or lightheadedness.

Workers who appear to be disoriented or confused, or suffer inexplicable irritability, malaise, or flu-like symptoms, will also stop work and rest in a cool location with rapidly circulating air and be kept under skilled observation.

Cold Stress

Hypothermia

Hypothermia is a drop in the core body temperature below 96.8°F. The first symptoms of hypothermia are uncontrollable shivering and the sensation of cold at about 95°F; this is followed by a slowed and sometimes irregular heartbeat, a weakened pulse, and a drop in blood pressure. Vague or slow slurred speech, memory lapses, apathy, incoherence, and drowsiness may occur. Other symptoms may include cool skin, slow, irregular breathing, apparent exhaustion, and fatigue after rest.

Hypothermia is caused by prolonged exposure to a cold environment, whether air, water, or snow and ice. Adequate dry clothing with appropriate insulating capacity must be provided to workers to prevent hypothermia, especially if work is performed in air temperatures below 40°F. Wind chill is a critical factor. Work at a slow but steady pace. The job should be a “no sweat” operation.

Unless there are unusual or extenuating circumstances, cold injury to other than the extremities (hands, feet, and head) is not likely to occur without the development of the initial signs of hypothermia. Older workers or workers with circulatory problems require special precautionary protection against hypothermia. The use of extra insulating clothing and/or a reduction in the duration of the exposure period are special precautions that should be considered for these workers. The precautionary actions to be taken will depend upon the physical condition of the worker and should be determined with the advice of a physician with knowledge of the cold stress factors and the medical condition of the worker.

Treatment

First aid for mild hypothermia will be performed as follows:

- End the exposure—get the victim out of the cold and wet
- Replace wet clothing with dry, or add insulation to clothing
- Offer warm, non-alcoholic fluids
- Increase exercise
- Seek shelter from wind, wet, and cold

CAUTION: If the victim remains cold for a number of hours, chemical changes may have taken place which, on re-warming, may cause major medical problems for the victim and which could result in death. Severely hypothermic victims are best warmed in the hospital

under controlled conditions. If a severely hypothermic victim cannot be transported to a hospital within a few hours, re-warming should begin in the field.

Frostbite

Frostbite can occur either before or after the onset of hypothermia when body tissue (usually an extremity) is exposed to freezing temperatures. Frostbite occurs when the fluids surrounding tissue cells freezes. The danger of frostbite increases with increased wind chill and/or reduced temperatures below 32°F. Frostbite can also occur if tissues are in prolonged contact with a frozen material or object. Skin contact with frozen metal, for example, can result in frostbite in a short period of time, even in a warm environment.

There are three degrees of frostbite:

- First degree – freezing without blistering or peeling, “frostnip”
- Second degree – freezing with blistering and/or peeling
- Third degree – freezing resulting in the death of skin tissue and possibly the death of underlying tissues as well

Symptoms of frostbite include the following:

- The skin changes color to white or grayish-yellow, progresses to reddish-violet, and finally turns black as the tissue dies
- Pain may be felt at first, but subsides
- Blisters may appear
- The affected area is cold and numb

Frostbite can be prevented by wearing sufficient protection to prevent skin from coming into prolonged contact with a freezing environment. The following steps can be taken:

- Wear sufficient clothing. Mittens are better than gloves. Face masks and wool stocking caps are better than hats. Wind and waterproof hoods protect the face and neck.
- Clothing should be loose enough to prevent constriction of blood vessels. Boots must be roomy enough to permit movement of the toes with no feeling of tightness.

- Do not contact conductive metals or contact gasoline or other solvents with bare skin because rapid evaporation of solvents may quickly lead to frozen tissues in a cold environment.
- Exercise the toes and fingers to maintain circulation.
- Frequently observe the condition of your partners' face, hands, and ears for signs of frostbite.
- Avoid smoking.
- Avoid drinking alcoholic beverages.

Treatment

First aid for superficial frostbite (first degree) is as follows:

- Place a warm body part next to the frozen area, applying firm, steady pressure.
- DO NOT RUB THE AREA. Rubbing may cause further damage to already injured skin.
- Protect the area from further freezing.

First aid for deep frostbite (second and third degree) is as follows:

- KEEP THE FROZEN PART FROZEN!
- Prevent further injury: avoid rubbing and further freezing of unaffected tissue.
- If the part has thawed, the part should NOT be allowed to refreeze or bear weight. A victim with thawed feet should be carried out.
- Give the victim plenty of fluids and evacuate to medical assistance as soon as possible.

Trench Foot

This condition may be caused by long, continuous exposure to cold without freezing, combined with persistent dampness or actual immersion in water. Edema (swelling), tingling, itching, and severe pain occur, and may be followed by blistering, death of skin tissue, and ulceration. When other areas of the body are affected besides the feet, the condition is known as chilblains.

Trench foot and chilblains can be prevented by keeping the body as dry as possible at all times. Waterproof boots should be worn when required, but provisions must be made for preventing excessive perspiration to accumulate inside the boots. Socks should be changed at least twice daily, and the boots should be wiped dry inside with each change of socks. The feet should also be wiped dry and foot powder should be applied.

Treatment

Affected body parts should not be rubbed or massaged, but bathed in water using plain white soap. Dry thoroughly and elevate the body part, allowing the body part to be exposed at room temperatures. If the feet are affected, do not walk during treatment.

9.9 FIRE PREVENTION PLAN

Fire prevention and protection measures require preplanning. At least one 10-pound dry chemical ABC fire extinguisher will be located in the project vehicle. Employees will follow safe work practices to include proper storage of flammable and combustible liquids such as spray paint. Smoking is permitted only in those areas designated specifically by the SSHO. Smoking is not allowed in Tetra Tech company vehicles, and there will be no smoking in non-permitted areas.

9.10 WILD LAND FIRE MANAGEMENT PLAN

The most likely fire scenario that could occur, especially during the drier summer months, is a wildland fire. It is unlikely that project activities will be the source of a wildland fire. With the many wetlands present on the property, wildland fires would more likely occur in the surrounding forested areas or in areas of grass no longer subjected to tidal floods. Workers will observe for signs of smoke that signal a potential fire is burning. The team will move to an open location (e.g., out of the trees onto open land) to determine whether the source of the smoke or fire can be identified and if there is a potential for danger from fire. If there is any danger and a wildland fire is observed, the EC will call 911 and take action to evacuate the crew to a safe location upwind and out of harm's way.

If safe to do so, upon confirming fire or likely fire, the team will head for the project vehicle to retreat from the area. This will be done only if the fire is not in the direction of the site vehicle and is not upwind. If smoke is present in the breathing zone, workers will head upwind and away from the smoke as inhalation of smoke is of immediate danger if it is thick.

There will be no wildland firefighting done by any of the team. As a last resort, if unable to evacuate the area to the project vehicle by the most direct route or to the project vehicle, the

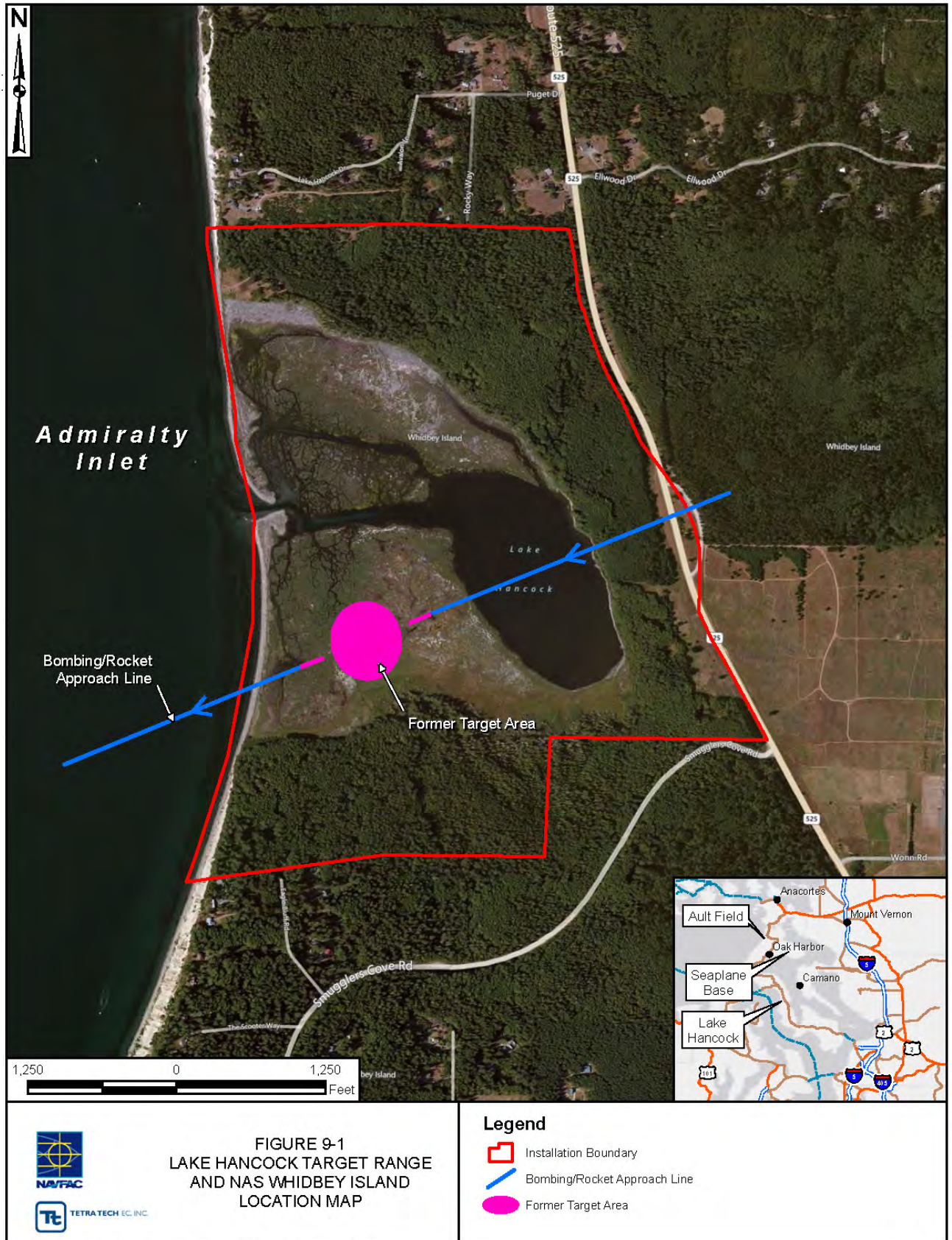
team will attempt to relocate to the beach as a primary evacuation route, or toward the lake if unable to access the beach. If there is any threat of being trapped by fire or being unable to escape the smoke, call 911 immediately to report your location.

If smoke is interfering with breathing, wet a piece of clothing or towel and place it over your mouth and nose while breathing; retreat toward an upwind location while crouching as low as possible.

9.11 CONTINGENCY PLAN FOR SEVERE WEATHER

Weather Emergency

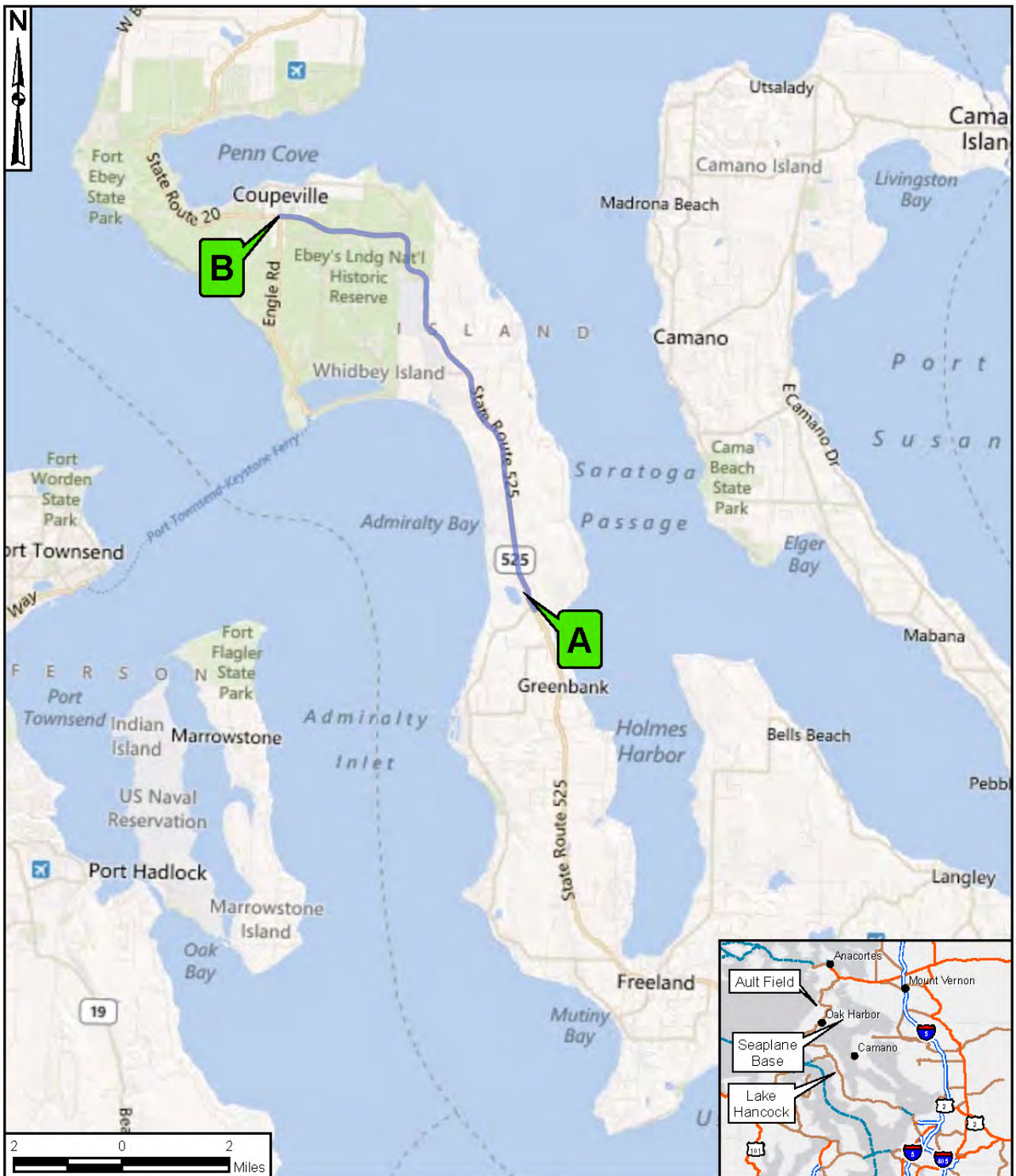
Should personnel be caught in severe weather, they will immediately seek shelter within the project vehicle. If personnel are in the project vehicle when severe weather occurs, they will remain in the vehicle and not attempt to go outside. It is anticipated that most weather-related issues (heavy wind or rain, thunderstorms) will not become an emergency event; however, rare weather events such as snowstorm, severe fog, heavy rain, and road washout could make it difficult or temporarily impossible for a crew to return to the site vehicle to wait out the storm. More likely during severe weather are injuries that could occur from flying debris, slips or falls, or having body parts slammed in vehicle doors. In the event of adverse weather, the SSHO will determine whether work can continue without sacrificing the health and safety of field workers. In the event adverse weather is forecast, personnel will be put on alert and the situation will be closely monitored. If lightning is observed or thunder is heard and the team is in the field, the team will proceed as quickly as is safely possible to the site vehicle to wait out the storm for 30 minutes after the last visible lightning event.






**FIGURE 9-1
 LAKE HANCOCK TARGET RANGE
 AND NAS WHIDBEY ISLAND
 LOCATION MAP**

- Legend**
- ▭ Installation Boundary
 - ↔ Bombing/Rocket Approach Line
 - Former Target Area

R:\projects_2012\Lake Hancock\maps\Figure 2 1 LHTR NASW Location Map.mxd



  **FIGURE 9-2**
LAKE HANCOCK TARGET RANGE
EMERGENCY ROUTE TO HOSPITAL

Legend
 Emergency Route

R:\projects_2012\Lake_Hancock\maps\Figure_9_2_LHTR_NASW_Emergency_Route_Map.mxd

10.0 RISK MANAGEMENT PROCESSES

AHA tables have been developed for each project activity that has significant safety and health hazards in accordance with Section 01.A.13 of EM 385-1-1. These AHA tables are included in Attachment 6.

11.0 REFERENCES

USACE (U.S. Army Corps of Engineers). 2007. Safety and Occupational Health Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) Activities. ER 385-1-92. May 1.

USACE. 2008. Safety and Health Requirements Manual, Engineering Manual (EM) 385-1-1, Washington, DC. September 15.

Accident Prevention Plan
Contract N62470-08-D-1008
Task Order JP01
NAS Whidbey Island, WA

Final
August 8, 2012

ATTACHMENT 1
SITE SAFETY AND HEALTH PLAN



FINAL
8 AUGUST 2012

Site Safety and Health Plan

Wetlands Delineation and Impact Study at the Former Lake Hancock Target Range, Site EO351

NAS Whidbey Island

Whidbey Island, Washington

Department of the Navy

Naval Facilities Engineering Command Northwest

1101 Tautog Circle, Suite 203

Silverdale, WA 98315-1101



Site Safety and Health Plan
Contract N62470-08-D-1008
Task Order JP01
NAS Whidbey Island, WA

Final
August 8, 2012

CONTRACT NO. N62470-08-D-1008
TASK ORDER JP01

FINAL
SITE SAFETY AND HEALTH PLAN
WETLANDS DELINEATION AND IMPACT STUDY AT THE
FORMER LAKE HANCOCK TARGET RANGE, SITE EO351,
NAVAL AIR STATION WHIDBEY ISLAND, WASHINGTON

TETRA TECH

AUGUST 8, 2012

CONTENTS

1.0	INTRODUCTION	1-1
1.1	SITE DESCRIPTION	1-1
1.2	PRIOR INVESTIGATIONS AND REMOVAL ACTIONS	1-2
1.3	PROJECT DESCRIPTION	1-4
2.0	ORGANIZATION AND RESPONSIBILITIES	2-1
3.0	GENERAL SITE RULES	3-1
4.0	HAZARD CHARACTERIZATION	4-1
4.1	PHYSICAL HAZARDS	4-1
4.1.1	MEC Hazard Identification and Mitigation	4-1
4.1.2	Illumination Hazard Identification and Mitigation	4-3
4.1.3	Excavation Hazard Identification and Mitigation	4-3
4.1.4	Adverse Weather Conditions Hazard Identification and Mitigation	4-3
4.1.5	Heat and Cold Stress Hazard Identification and Mitigation	4-4
4.1.6	Hand and Power Tool Hazard Identification and Mitigation	4-4
4.1.7	Noise Hazard Identification and Mitigation	4-4
4.1.8	Traffic and Public Hazard Identification and Mitigation	4-5
4.1.9	Slip, Trip, and Fall Hazard Identification and Mitigation	4-5
4.1.10	Manual Lifting Hazard Identification and Mitigation	4-6
4.1.11	Fire and Explosion Hazard Identification and Mitigation	4-7
4.1.12	Natural Disaster Hazard Identification and Mitigation	4-7
4.1.13	Work Near Water Hazard Identification and Mitigation	4-9
4.2	CHEMICAL HAZARDS	4-9
4.2.1	Hazard Identification	4-9
4.2.2	Health Effects	4-10
4.3	BIOLOGICAL HAZARDS	4-11
4.3.1	Insect Bite and Sting Hazard Identification and Mitigation	4-11
4.3.2	Wild Animal Hazard Identification and Mitigation	4-13
4.3.3	Bloodborne Pathogen Hazard Identification and Mitigation	4-13
4.3.4	Poisonous Plant Hazard Identification and Mitigation	4-15
4.4	ACTIVITY HAZARD ANALYSIS	4-15

5.0	TRAINING AND QUALIFICATIONS	5-1
6.0	SITE CONTROL ZONES	6-1
7.0	PERSONAL PROTECTIVE EQUIPMENT	7-1
8.0	MEDICAL SURVEILLANCE PROCEDURES	8-1
9.0	ENVIRONMENTAL AND PERSONNEL MONITORING	9-1
10.0	COMMUNICATIONS	10-1
10.1	TELEPHONES	10-1
10.2	AIR HORNS	10-1
11.0	PERSONNEL AND EQUIPMENT DECONTAMINATION	11-1
12.0	EMERGENCY RESPONSE PLAN	12-1
13.0	SANITATION	13-1
13.1	POTABLE WATER	13-1
13.2	HAND WASHING FACILITIES	13-1
13.3	TOILET FACILITIES	13-1
14.0	LOGS, REPORTS, AND RECORDKEEPING	14-1
14.1	MEDICAL AND TRAINING RECORDS	14-1
14.2	ON-SITE LOG	14-1
14.3	WEEKLY AND MONTHLY SAFETY REPORTS	14-1
14.4	EVENT REPORTS	14-1
14.5	OSHA FORM 300	14-1
14.6	HEALTH AND SAFETY LOGBOOKS	14-2
14.7	WORK PERMITS	14-2
15.0	REFERENCES	15-1

ATTACHMENTS

ATTACHMENT A CONTACT AND MEDICAL DATA SHEET

TABLES

Table 7-1.	Personal Protective Equipment Selection	7-2
-------------------	---	-----

ACRONYMS AND ABBREVIATIONS

AIDS	acquired immune deficiency syndrome
APP	Accident Prevention Plan
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CMC	Corporate Medical Consultant
CPR	cardiopulmonary resuscitation
dBA	A-weighted decibels
DCN	Design Change Notice
DEET	N,N-Diethyl-meta-toluamide
DMM	discarded military munitions
EC	Emergency Coordinator
EHS	Environmental, Health, and Safety
EM	Engineering Manual
ESS DR	Explosive Safety Submission Determination Request
FOL	Field Operations Lead
GPS	global positioning system
HAZCOM	Hazard Communication
HIV	human immunodeficiency virus
HVAR	high-velocity air rocket
LHTR	Lake Hancock Target Range
MC	munitions constituents
MEC	munitions and explosives of concern
MPPEH	material potentially posing an explosive hazard
MSDS	material safety data sheet
NASWI	Naval Air Station Whidbey Island
Navy	U.S. Navy
NTR	Navy Technical Representative
OSHA	Occupational Safety and Health Administration
PA	Preliminary Assessment

ACRONYMS AND ABBREVIATIONS (continued)

PEL	permissible exposure limit
PESM	Project Environmental and Safety Manager
PPE	personal protective equipment
RPM	Navy Remedial Project Manager
SCAR	sub-caliber rocket
SHA	Site Hazard Assessment
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
TOM	Task Order Manager
USC	United States Code
UXO	unexploded ordnance

1.0 INTRODUCTION

1.1 SITE DESCRIPTION

This Site Safety and Health Plan (SSHP) includes safety procedures that will be implemented during the wetlands delineation and impact study that will be conducted at the former Lake Hancock Target Range (LHTR), Site EO351. The site is a former target range where remedial actions, described in Section 1.2, were completed in the past. The site is known to contain munitions and explosives of concern (MEC)/material potentially presenting an explosive hazard (MPPEH). The project description, Section 1.3, describes the activities that will be performed during this project.

Naval Air Station Whidbey Island (NASWI) is a Department of the Navy facility encompassing approximately 8,000 acres located just north of Oak Harbor, Washington. NAS Whidbey Island is divided into four distinct parcels: 1) the main airfield or Ault Field, 2) Seaplane Base located at Crescent Harbor, 3) Lake Hancock Target Range, and 4) Outlying Field Coupeville. The former LHTR is adjacent to the Strait of Juan de Fuca. The LHTR occupies roughly 423 acres approximately 20 miles south of Ault Field and 1 mile north of Greenbank, Washington.

Lake Hancock is a shallow salt water lagoon approximately 37 acres in size surrounded by a salt marsh. To the east, the site is bordered by a horseshoe-shaped ridge. To the west, a 50-foot-wide channel connects Lake Hancock to Admiralty Inlet, which creates a tidal influence to Lake Hancock. The site was obtained by the Department of Defense circa 1943. The former LHTR was used for aerial bombing training between 1943 and 1971, and a portion of the site is currently used to monitor training in Admiralty Bay and other U.S. Navy (Navy) and U.S. Marine training exercises that do not include military ordnance. The site is fenced on the north, east, and south side with locked gates, but is accessible from the beach by which trespassers have been known to enter the site for hiking and hunting. The site is not actively patrolled by base security. Vegetated wetlands cover roughly 33 percent of the site. Access is difficult and is best accomplished at low tide because of tidal influence of seawater into the salt marsh areas.

According to the Feasibility Study Report for Lake Hancock Target Range (Tetra Tech NUS 2011), the marsh surface has been altered by World War II practice bombs used in training. The large number of salt pans (small, shallow ponds of saline water having no emergent vegetation) may be the result of the impact of the munitions. The range was

damaged by fire in 1951 and remained inactive until 1953, after which it was re-activated. It was reportedly heavily used in 1957.

The Lake Hancock site ranges in elevation from below sea level to approximately 140 feet above mean sea level. The northern and eastern boundaries of the site slope gently to the southwest and west, respectively. The wooded zone in the southwest corner of the range slopes to the northeast. Bluffs approximately 100 feet high are present on the northern and southern beach areas. The rest of the site is virtually flat, and much of it receives regular tidal flooding (Tetra Tech NUS 2011).

Vegetation within Lake Hancock consists of a mix of salt marsh, mixed forest, Douglas fir, and alder forest. Vegetated wetland areas at Lake Hancock cover roughly one-third of the site, including the former target area. The wetlands support five major plant community types: high salt marsh, low salt marsh, scrub-shrub wetland, freshwater marsh, and Sitka spruce bog. Upland areas include coniferous and deciduous forests as well as an open grassland area that has been planted with coniferous trees. Upland forest vegetation covers about 38 percent of the area, including areas of mixed forest, Douglas fir, and alder forest (Tetra Tech NUS 2011).

1.2 PRIOR INVESTIGATIONS AND REMOVAL ACTIONS

The following information is summarized from the 2011 Feasibility Study Report for Lake Hancock Target Range (Tetra Tech NUS 2011). The former LHTR underwent previous removal actions in 1972 and 1973 when three separate surface clearances were conducted by military personnel to support potential land transfer options. According to the 2011 Feasibility Study, approximately 15 tons of ordnance-related scrap was removed from the site during these three clearance operations, and the following ordnance items were identified:

- MK 23, 43, 76 and 89 practice bombs
- 2.25-inch sub-caliber rockets (SCARs) – accounting for 97 percent of all munitions recovered
- 5-inch high-velocity air rockets (HVARs)
- 100-, 250-, and 500-pound water-sand-filled bombs
- MK 6, 25, and 58 smoke bombs

A fourth clearance (date unknown) was documented in a February 1982 memorandum that stated that several 25-pound bombs containing spotting charges had been removed from the site.

In May 1996, an archaeological reconnaissance survey of the LHTR was conducted and documented in an archaeological trip report. Four known archaeological sites were located and recommendations were made for future projects that include major excavation. During this same year, an ecological survey report was also performed to document site conditions and potential effects of remedial alternatives on the habitats at the LHTR.

In 1996, aerial and ground-based geophysical surveys were performed to detect surface and subsurface ferrous objects within the former target area. The aerial survey and ground verification surveys positively identified surface and subsurface metallic debris and anomalies of MEC and non-MEC related origins, and some anomalies identified as strong signals having the potential for being unexploded ordnance (UXO) and less strong signals that may also be UXO.

In 1998, a multi-phase Site Hazard Assessment (SHA) was performed. The SHA included investigation of the site to assess potentially elevated chemical levels near the target zone through collection of sediment and surface water samples near identified geophysical anomalies and some removal of identified contamination. Sampling of sediments and surface water, including the former target center, was also conducted. Samples were analyzed for several munitions constituents (MC), and none were detected. Only metals were identified as contaminants of concern at the various anomalous areas identified during the SHA investigation. The Navy conducted a removal action during which rusted metal plates associated with an observation tower and nearby contaminated soil were removed. After the SHA and removal action, one confirmation sample slightly exceeded state sediment standards for lead. All other metals were below screening levels after the removal action. The site was recommended for no further action related to chemical contamination.

In 2007, a Preliminary Assessment (PA) was performed to summarize the history of munitions use at several sites, including the former LHTR. The PA determined that the potential existed for MEC to be present in surface and subsurface soil and sediment, based on the former use of the site as a target training range and the recovery of rocket motors and warheads from the target area and beach. It was determined that MEC and munitions debris may be present in the subsurface soil and subsurface sediment of Lake Hancock up to a depth of 10 feet. While the items observed during the PA site reconnaissance were all determined to be inert munitions debris, the potential exists for practice bombs and rockets

containing unfired spotting charges to be present. Navy personnel, contractors, and trespassers who gain access to the site may come into contact with MEC via handling, removing, or walking over the top of the items. The PA also evaluated the potential for MC to pose an exposure pathway; this analysis indicated that there are no complete pathways to potential receptors, and that MC are not expected to be present at levels that could endanger human health or the environment.

In 2010, the Site Investigation Report was prepared that documents the results of MC sampling efforts conducted to date. Surface and subsurface soil, sediment, and surface water samples were collected in 2009 and analyzed for lead and perchlorate. Perchlorate was sampled at this time because it was not analyzed in previous sampling efforts. Neither was detected above their respective screening values.

1.3 PROJECT DESCRIPTION

This project is being performed to delineate and characterize the wetlands at LHTR and determine if there are any portions of the site where intrusive MEC/MPPEH removal from the surface to a depth of 1 foot below the surface would cause irreparable damage or impacts to the wetlands to the extent that digging should be avoided. This work is being done in advance of potential future MEC removal actions.

The site will be accessed by the team primarily by foot. A project vehicle will transport personnel and equipment to and from the site and then personnel will walk to various areas to conduct the project tasks.

To avoid potential hazards of MEC/MPPEH, the wetland delineation team consisting of a wetlands biologist and a geographic information system technician will be escorted at all times by a qualified UXO technician who will, following well-established procedures, ensure MEC avoidance for the team. There will be no handling of MEC/MPPEH on this project. The UXO technician will use a handheld magnetometer to identify metallic anomalies that could be MEC and will ensure personnel safety by providing safe access around the item. In addition, global positioning system (GPS) locations of any munitions debris observed by the UXO technician will be recorded, and a map will be provided to the Navy.

During the wetlands delineation and the impact study, digging will be required for both wetland soil pits and the collection of soil samples for analysis. Wetland soil pits will not exceed 18 inches in depth. As many as 16 soil samples will be collected from surface up to 1 foot in depth and analyzed for sulfide and sulfite at a qualified laboratory. The field team

will ensure each sampling area is cleared by the UXO technician of any metallic anomalies prior to digging. Digging will be accomplished using handheld shovels, trowels, or hand augers to the required depth (not to exceed 18 inches).

This project will consist of the following tasks:

- Mobilization/demobilization of equipment and materials
- Performing wetlands delineation and characterization
- Environmental soil sampling

The potential for chemical exposure during this project from site contaminants is not expected to occur based on prior studies and the type of project activities being conducted. Personnel conducting the field activities will therefore not be required to have certification documenting compliance with 29 Code of Federal Regulations (CFR) 1910.120 for hazardous waste operations. The following sections identify potential chemical and physical hazards associated with the planned field work as well as mitigation measures to minimize potential exposures. In addition, an Activity Hazard Analysis has been included in the Accident Prevention Plan (APP) (Attachment 6) that specifies health and safety risks and mitigation measures associated with the field work.

2.0 ORGANIZATION AND RESPONSIBILITIES

[See Section 4.0 of the APP]

3.0 GENERAL SITE RULES

[See Attachment 4 of the APP]

4.0 HAZARD CHARACTERIZATION

Several general and specific safety and health hazards are likely to be associated with the planned work. The work is in a fairly remote location with a small work crew working as a team. The buddy system will be in use at all times while on the site so that no person works alone or out of sight of at least one other person, and both will be accountable to each other with a means of communication (e.g., cellular telephone and emergency contact information) for emergencies. The potential for UXO detonation exists should contact with these items occur. Other physical hazards include injuries resulting from slips, trips, and falls, contact with poisonous plants or wild animals, temperature extremes that could cause heat or cold stress, and potential for drowning. In addition, because the public might access this land for hunting (trespassers), the potential exists for hazards from gunfire if hunters are present. Chemical hazards presented by exposure to site contaminants is not anticipated because the tasks do not include any chemical soil sampling and the site has been recommended for no further action related to chemical contaminants; however, hazardous materials used in support of field operations such as the sample preservation chemical zinc acetate could present a hazard to workers. These hazards and the controls that will be applied to manage them are discussed below. All site personnel are also required to comply with the General Site Rules listed in Attachment 4 of the APP. A more detailed listing of hazard control strategies are provided in the Risk Management Processes, provided in Section 10.0 of the APP.

4.1 PHYSICAL HAZARDS

4.1.1 MEC Hazard Identification and Mitigation

The term MEC, which distinguishes specific categories of military munitions that may pose unique explosives safety risks, includes UXO, as defined in 10 United States Code (USC) 101(e)(5); discarded military munitions (DMM), as defined in 10 USC 2710(e)(2); or MC (e.g., trinitrotoluene, royal demolition explosive), as defined in 10 USC 2710(e)(3), present in high enough concentrations to pose an explosive hazard. UXO are military munitions that have been primed, fuzed, armed, or otherwise prepared for action; have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard; and remain unexploded whether by malfunction or design. DMM are military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term DMM does not include UXO, military munitions that are being held for future use or planned disposal, or

military munitions that have been properly disposed of consistent with applicable environmental laws and regulations.

The type of MEC that could be encountered on this project consists of UXO because this area was an active range.

MEC types used at the LHTR include practice bombs, rockets, pyrotechnics, and other small ordnance including practice bombs (MK 89, MK 76, MK 43 and MK 23); 2.75-inch rockets; 2.25-inch SCARs; 5-inch HVARs; water-sand-filled bombs (100-pound, 250-pound, and 500-pound); and smokes (MK 25, MK 58 and MK 6). A maximum penetration depth of 10 feet (based on a 500-pound bomb) is expected. During the preliminary assessment site walk in 2006, munitions debris was found in salt pans from the surface to approximately 6 to 8 inches below the water line around the target area, on the beach, and in the surf along the beach. The highest concentration of practice 2.75-inch rocket motors and warheads was recovered from around the target area. It is also possible that the pilots would have overshot the target area during practice bombing, resulting in ordnance items scattered around the target area or further downrange to the west. Several rocket motors were found 900 feet or more from the center of the target, on or just off of the beach. Munitions debris includes practice rocket motors and warheads. Although practice bombs and pyrotechnics were used at the site, none were observed during the preliminary assessment site walk. Tetra Tech has prepared an Explosive Safety Submission Determination Request (ESS DR) in accordance with NOSSAINST 8020.15 Explosive Safety Review, Oversight, and Verification of Munitions Responses. It is anticipated that based on anomaly avoidance, the ESS DR will result in a waiver from the full ESS requirements.

All project personnel will receive MEC awareness training prior to beginning field activities. This brief will be provided by the UXO technician/Site Safety and Health Officer (SSHO).

MEC could be present on the surface or subsurface soils and sediments, including on the beach areas within the LHTR. Exposure could occur while walking on top of an item. During the project, the field team will be escorted by the UXO technician who will provide MEC avoidance to ensure team safety for all project tasks. The UXO technician is qualified to provide this support in accordance with the Department of Defense Explosives Safety Board (DDESB) TP-18 as a Level III technician. MEC avoidance procedures are included in Section 3.4 of the Work Plan and are based on applicable requirements in Environmental, Health, and Safety (EHS) Procedure UXO-14 – MEC Avoidance Procedures for Sampling, Drilling, and Low Risk Construction Support.

The field instrument (hand-held magnetometer) used by the UXO technician will be evaluated to ensure it is working properly prior to entering the project area, and the equipment will be function tested daily to ensure it is working properly. The function tests will be documented by the UXO technician in their logbook on a daily basis.

4.1.2 Illumination Hazard Identification and Mitigation

All fieldwork will be performed during daylight hours only. Project personnel will plan the activities such that they will be back to the project vehicle at least one hour prior to sunset. For emergency purposes, all personnel will carry portable flashlights for emergency egress in the event a person is injured and response or egress must occur after sunset.

All personnel will wear high-visibility reflective traffic vests when working outdoors in this area, primarily because of the potential for trespassers hunting within the LHTR.

4.1.3 Excavation Hazard Identification and Mitigation

Shallow (18 inches or less below ground surface) excavations will be hand dug using shovels, trowels, or hand augers to collect environmental soil samples. It is not anticipated that there are underground utilities in these areas, and the excavations do not pose substantial risk for contact with underground utilities if present. The UXO technician has a hand-held magnetometer, which can also be used to identify metallic objects including underground shallow linear features (if metallic) that could potentially be a utility line.

4.1.4 Adverse Weather Conditions Hazard Identification and Mitigation

In the event of adverse weather conditions, the SSHO will determine whether work can continue without potentially risking the safety of field workers. Some of the factors to be considered prior to determining whether work should continue are as follows:

- Treacherous weather-related working conditions (cool temperatures, hail, rain, high winds [exceeding 25 miles per hour] and associated wind chill with cold weather [also see Cold Stress in Section 9.8 of the APP])
- Visible lightning within 10 miles
- Limited visibility (fog)
- Other factors as appropriate that are identified in conjunction with lesser weather related hazards

Prior to beginning work each day, the SSHO will review the day's weather forecast to screen for anticipated severe weather conditions, warn the field crews accordingly, heighten awareness, and ensure proper planning. In the event that work is suspended, the SSHO will notify personnel by cellular telephone, or in person as applicable. If this call is made, all personnel will proceed to designated assembly areas (e.g., site vehicles) for further instruction.

4.1.5 Heat and Cold Stress Hazard Identification and Mitigation

[See Section 9.8 of the APP]

4.1.6 Hand and Power Tool Hazard Identification and Mitigation

If personnel use hand and power tools to complete the various project tasks, the following protective measures will be implemented to minimize exposure to the hazards presented by the use of hand and power tools in accordance with Procedure CP-7, Construction Tools and Equipment:

- Perform daily inspections of each tool prior to use
- Remove and replace broken or damaged tools
- Use proper personal protective equipment (PPE)
- Avoid wearing loose clothing or hair that could get caught in moving or rotating parts
- Use and maintain tools in accordance with the manufacturer's operations manual
- Ensure that all electrical tools are Underwriters Laboratories-certified or other nationally recognized testing laboratory-listed, and either have approved grounding prong or are double insulated
- Inspect all electrical cords for frays or worn sections
- Prohibit the use of electric cords to lower or hoist tools
- Protect cords from traffic and water
- Use a ground fault circuit interrupter outside or in wet environments at all times

4.1.7 Noise Hazard Identification and Mitigation

Noise is a potential hazard associated with the overflying aircraft operations at the active air station. Excessive noise presents two potential problems: one, it hinders communication between workers; and the other, exposure to it (both continuous and impact noise) can have

adverse effects on a person's hearing. These adverse effects include both temporary and permanent hearing damage.

The SSHO will evaluate noise hazards at the site and direct the appropriate hearing protection if the overflying aircraft or other equipment present a significant noise hazard, though sources of significant noise are not anticipated on this project. The SSHO will ensure that hearing protection devices such as disposable earplugs are made available and are used by all personnel near sources of high-intensity noise. Hearing protection is required any time the noise level reaches 85 A-weighted decibels (dBA) or greater.

4.1.8 Traffic and Public Hazard Identification and Mitigation

Work is not anticipated to be performed at locations where contact with traffic may pose a hazard to site workers though workers may park vehicles along roads that could have traffic. Work in any areas of traffic will require use of high-visibility safety vests and spotters will be used as required for backing up.

In addition, because of the potential for trespassing public to enter the area from the beach for hunting, personnel will wear high-visibility safety vests when working in the LHTR. Should gunfire be heard while working on site within the LHTR, or if trespassers with guns are seen, personnel will return to the site vehicle and report the sighting to the Task Order Manager (TOM), Navy Technical Representative (NTR), and Remedial Project Manager (RPM) so that base security can be contacted.

4.1.9 Slip, Trip, and Fall Hazard Identification and Mitigation

The LHTR will undoubtedly pose a number of slip, trip, and fall hazards because the location is fairly remote and unmaintained. Slips, trips, and falls may be caused by slippery and uneven or unstable walking surfaces, obstacle hazards, or holes that may be hidden by vegetation or debris, wet surfaces, and even the vegetation itself. Slips, trips, and falls are a leading cause of injuries in field-related work settings. Potential adverse health effects include falling to the ground and becoming injured, twisting an ankle, or sustaining more severe injuries to the back, head, or neck. Falling or stepping onto a sharp object is also a hazard that can lead to cuts, lacerations, or puncture wounds. Stepping into muddy or marshy areas also presents the potential for becoming temporarily stuck in the sediments and potentially could lead to falling over into the mud or water.

Site personnel will be instructed to look for these potential safety hazards and attempt to avoid them as well as warn other team members of the hazard. If the hazard cannot be

immediately removed or avoided, action must be taken to warn site workers about the hazard and appropriate precautions must be taken. The UXO technician providing MEC avoidance will also route the field teams past other identified hazards that may be encountered while performing avoidance.

Any worker who could be exposed to a fall of 6 feet or more must be protected using proper fall protection requirements. If any of these areas (e.g., bluffs, pits, or other areas that pose a fall hazard meeting this description) are identified, these areas will be marked on the map and will be avoided.

4.1.10 Manual Lifting Hazard Identification and Mitigation

Manual lifting of heavy objects such as tools, equipment, and materials may be required at times. Failure to follow proper lifting techniques can result in back injuries and strains. Back injuries are a serious concern because they are a common workplace injury, often resulting in lost or restricted work time and long treatment and recovery periods.

Tetra Tech Procedure EHS 3-1, Ergonomics, states that individual employees are not to lift loads greater than 50 pounds. Backpacks (for transporting personal gear and equipment) should not exceed 20 to 25 pounds per person. The following procedures should be followed to safely lift anything, particularly heavier loads:

- Size up the load as to its weight, size, and shape.
- Place feet about a foot apart and close to the object for optimal balance.
- Bend the knees slightly into a power position and grasp the object with a good handhold.
- Using both leg and back muscles, lift the load straight up, smoothly and evenly. Pushing with the legs, keep the load close to the body.
- Lift the object into carrying position, avoiding twisting movements, until the lift is completed.
- Turn the body with changes of foot position, making sure the path of travel is clear.
- Using both leg and back muscles, comfortably lower the load by bending the knees. When the load is securely in place, release the grip. How you set the load down is as important as how you pick it up.
- The same steps apply to team lifting, with the emphasis on coordination. All should start and finish the lift action simultaneously and perform turning movements together.

- Consider using mechanical equipment for any heavy or awkward lifting.

4.1.11 Fire and Explosion Hazard Identification and Mitigation

The potential for fire and explosion hazards on this project includes fires from inadvertent contact with MEC if detonated, smoking, and any activity that causes a spark that could ignite dry vegetation, and engine problems. Although fires and explosions may arise spontaneously or by natural events (e.g., lightning strike), they are more commonly the result of careless actions during activities such as smoking in undesignated smoking areas or during refueling of project vehicles.

To minimize potential for fire, no smoking will be allowed on the project site except in specifically designated smoking areas at the direction of the SSHO. Project vehicles will only be refueled at service stations and there is no portable gas cans used on this project. There is no authorized hot work (any spark producing operation) on this project. Any fire that occurs will more likely be wildland fires rather than fires originating from the field crew's actions. In no instance will personnel fight any wildland fire. Instead, the field team will pull back to a location upwind of the fire (attempt to retreat to project vehicle only if it is upwind of the fire) and the SSHO or Field Operations Lead (FOL) will notify the fire department (see Table 9-1 in the APP).

4.1.12 Natural Disaster Hazard Identification and Mitigation

4.1.12.1 Earthquakes

Earthquakes are not uncommon in western Washington and the possibility for a strong earthquake does exist. Earthquakes may damage or collapse buildings, pipelines, electrical lines, overhead equipment, or tanks and can cause slopes to collapse. The damage may cause life-threatening injuries. During an earthquake, the following should be implemented:

- If inside, stay inside. Take cover under a strong bench, table, or desk against an inside wall or doorway and hold on.
- Stay away from windows, outside doors or walls, overhead materials, or anything that could fall.
- If outside during an earthquake, stay outside. Move away from buildings, overhead lights, wires, pipes, trees, conveyors, ducts, and other items.
- Assist the injured with first aid.

- All employees should inform their supervisor or Emergency Coordinator (EC) if any injuries, damage, or earthquake-related problems are noted. The EC should be directly informed of all emergency situations.
- If directed by the EC, contact 911 and coordinate with emergency service personnel.
- Supervisors will account for their employees and check their work area for damages. They will then notify the EC of any missing employees, injuries, high risks, or other significant damages.

In the event of an earthquake, the EC will implement the following:

- Activate the emergency alarms/air horn as necessary.
- Evacuate the area to the project vehicle to stand by.
- Monitor for any news announcements, including tsunami warnings.

Prior to resuming work after an earthquake, the EC and the SSHO will be observant of all work areas and roadways for damage and changed conditions.

4.1.12.2 Tsunamis

A tsunami could occur on Whidbey Island if a sufficiently sized and located seismic event occurs offshore. If a strong earthquake has occurred, stand by for a tsunami emergency. If working near the beach, move to higher ground. The EC will inquire about any issued tsunami warnings. Do not stay in low-lying coastal areas after a local earthquake. Should a warning be issued, wait for an “all-clear” to be issued by authorities before returning to coastal areas.

Approaching tsunamis are sometimes heralded by a noticeable rise or fall of coastal waters. This is nature’s tsunami warning that should be heeded. Potential danger areas are those less than 50 feet above sea level and within 1 mile of the coast for a tsunami of distant origin, and less than 100 feet above sea level and within 1 mile of the coast for a tsunami of local origin.

In the event that a tsunami warning is issued, all personnel will assemble and be accounted for in the field, then will be directed back to the site vehicle and staged pending evacuation notice.

4.1.12.3 Volcanic Eruptions

Volcanic eruptions have occurred within the state of Washington; however, an eruption without warning is unlikely. Depending on the proximity of the eruption and prevailing

winds, it is possible that fallout in the form of ash or cinders, as well as odor from volcanic gas, could be experienced. Should these events occur, personnel will head for the project vehicle and stay within the vehicle to limit inhalation of volcanic ash. Air vents, windows, and doors should be kept closed.

4.1.13 Work Near Water Hazard Identification and Mitigation

A potential secondary hazard associated with a slip, trip, or fall is when workers are working over or adjacent to water, including muddy marshy areas. At times, depending on tide conditions, some areas of the site may require workers to be in close proximity to waters which presents a potential for drowning or being carried away by currents or tides. Workers will wear U.S. Coast Guard-approved personal flotation devices (Type II or Type III) when working within 6 feet of open water greater than 1 foot in depth. The buddy system will also be crucial when working adjacent to open water so that immediate action can be taken should a person fall into the water.

4.2 CHEMICAL HAZARDS

4.2.1 Hazard Identification

The LHTR has been recommended for no further action following several studies to evaluate site contamination which has determined that there is no human health or ecological risk for lead or any other munitions related constituent. Exposure to any of the contaminants (namely lead) is not anticipated to occur based on prior investigation sample data and the nature of the work being performed during this project which will not present opportunity for routes of exposure to occur unless previously unidentified waste areas are discovered. All excavations performed for the digging of wetland soil pits or collection of soil samples are limited to 18 inches in depth. The soil samples are not being collected to determine or delineate chemical contamination; rather, they are for the purpose of determining potential acidifying action from sulfide and sulfate that could occur during potential future intrusive investigation and removal activities in wetland areas. As such, there will be no need for establishing site chemical hazard control zones or having any formal decontamination station for this work.

Should conditions at the site be different than expected upon inspection (e.g., visible contamination or exposed wastes are discovered in areas that need to be delineated), the RPM will be notified and information will be reviewed by the SSHO and the Project Environmental and Safety Manager (PESM) so that appropriate controls can be

implemented to complete the tasks. Based on the review and tasks to be performed, the site is not anticipated to present chemical-related hazards to employees working on this project.

During excavation and soil sampling, dust generation will be kept to a minimum, personnel sampling or handling the soil will wear gloves as required by the sampling and analysis plan procedures, and used sampling waste will be properly managed and disposed of.

The only sample preservative used for the preservation of sulfide samples is zinc acetate. Zinc acetate is an irritant to skin and the respiratory tract, can cause kidney damage if ingested, and is slightly flammable when exposed to high heat.

4.2.2 Health Effects

Arsenic is also a naturally occurring heavy metal in background soils in Washington. Contact with soils should not occur on this project to a degree that would put employees anywhere close the permissible exposure limit (PEL) for arsenic. The PEL for arsenic will not be exceeded where there are effective dust control measures that limit the amount of visible dusts in the air, good hygiene practices, and where contaminant levels in soil are relatively low. For example, when arsenic levels in soil are below 250 milligrams per kilogram (which is above the level anticipated at the project site), inhalation or ingestion of arsenic is below the PEL based on a conservative calculation by a Certified Industrial Hygienist (CIH). Soil sampling will include donning gloves in accordance with the sampling and analysis plan. Workers will have access to a hand washing station (fresh bottled potable water, soap, and paper towels at a minimum) where they will wash their hands before eating or smoking. Smoking and eating areas will be designated by the SSHO and will not be located in the active work area.

The SSHO will acquire material safety data sheets (MSDSs) for all chemical materials brought to the site such as the sampling preservative zinc acetate. The SSHO will conduct training for all site personnel in accordance with Procedure EHS 4-2, Hazard Communication (HAZCOM). HAZCOM training will be provided as a component of the initial site-specific training. The training will review the written HAZCOM program, proper chemical labeling, the location of MSDSs, site-specific chemicals of potential concern, hazards, and personal protection during sampling. Workers will use proper engineering controls or best management practices when using chemical products. In addition, workers will properly manage waste and minimize potential for contact with chemicals through donning and doffing PPE properly, maintaining proper ventilation when using chemical products, and practicing good personal hygiene (hand and face washing before eating or smoking, etc.).

More information on PPE selection and use is provided in Section 7.0.

4.3 BIOLOGICAL HAZARDS

Contact with rats, mice, and stinging or biting insects is possible and could present problems to workers should a bite or sting occur. The location of work is outdoors in wooded and semi-wooded areas. It is possible that other wildlife could be present, such as cougars, bears, foxes, or coyotes. In addition, it is possible that poisonous plants such as poison ivy or poison oak may be present on the site and workers walking around the site could come into contact with these plants.

Other biological hazards include those presented by exposure to bloodborne pathogens, for instance if first aid or cardiopulmonary resuscitation (CPR) aid is rendered.

Biological hazards as outlined in the following sections may be present at the site. The SSHO will instruct the field crew in the recognition and procedures for encountering biological hazards at the site.

4.3.1 Insect Bite and Sting Hazard Identification and Mitigation

Insects, including biting flies and bumble bees, are known to be present in the work areas; therefore, a chance of a bite or sting is possible, particularly on days when there is little to no wind. Some individuals may have severe allergic reactions to an insect bite or sting that can result in a life threatening condition.

The SSHO will instruct the field crew in the recognition and procedures for encountering biting or stinging insects at the site. Additionally, any individuals who have been bitten or stung by an insect will notify the SSHO. The following is a list of preventive measures:

- Apply insect repellent prior to fieldwork and as often as needed throughout the work shift. Apply N,N-Diethyl-meta-toluamide (DEET [vapor-active repellent]) to any exposed skin surface (except eyes and lips), and apply the permethrin repellent spray to field clothing. **Note: Allow the permethrin to dry before using the treated clothing.**
- Wear proper protective clothing (work boots, socks, and pants). Tuck pant legs into socks when possible.
- Field personnel who may have insect allergies will provide this information to the SSHO prior to commencing work, and shall have their prescription allergy medication on site. In addition, workers are encouraged to have over-the-counter

Benadryl (diphenhydramine) available for use should they not have a prescription for known severe allergies.

Mild insect 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. If insect bites become red or inflamed or symptoms such as nausea, dizziness, shortness of breath, etc., appear, medical care will be sought. Immediate care is needed if a person is allergic to insect bites/stings. If an allergic person receives a spider bite or insect bite/sting, seek immediate medical attention, keep the victim calm, and check vital signs frequently. Rescue breathing should be given if necessary to supply oxygen to the victim.

4.3.1.1 Tick Bite Hazard Identification and Mitigation

Lyme disease, which is not common in the west, is caused by bites from infected ticks that are common in and near wooded areas, tall grass, and brush. Ticks are small, ranging in size from as small as the comma punctuation contained in this sentence to about ¼ inch. When embedded into the skin, they may resemble a small freckle. Tick season extends from spring through summer, but may extend year-round in areas without significant cold weather.

Lyme disease is caused by infection from a deer tick that carries a spirochete. During the painless tick bite, the spirochete may be transmitted into the bloodstream, which could lead to the worker contracting Lyme disease. Lyme disease may cause a variety of medical conditions including arthritis, which can be treated successfully if the symptoms are recognized early and medical attention is received. Treatment with antibodies has been successful in preventing more serious symptoms from developing. If left untreated, Lyme disease can cause serious nerve or heart problems as well as a disabling type of arthritis.

Symptoms can include a stiff neck, chills, fever, sore throat, headache, fatigue, and joint pain. This flu-like illness is out of season, commonly happening between May and October when ticks are most active. A large expanding skin rash usually develops around the area of the bite. More than one rash may occur. The rash may feel hot to the touch and may be painful. Rashes vary in size, shape, and color, but often look like a red ring with a clear center. The outer edges expand in size. It is easy to miss the rash and the connection between the rash and a tick bite. The rash develops from 3 days to as long as 1 month after the tick bite. Nearly one-third of those with Lyme disease never experience the rash. Joint or muscle pain may be an early sign of Lyme disease. These aches and pains may be easy to confuse with the pain that comes with other types of arthritis; however, unlike many other types of arthritis, this pain seems to move or travel from joint to joint.

Lyme disease can affect the nervous system. Symptoms include stiff neck, severe headache, and fatigue usually linked to meningitis. Symptoms may also include pain and drooping of the muscles on the face, called Bell's Palsy. Lyme disease may also mimic symptoms of multiple sclerosis or other types of paralysis. Lyme disease can also cause serious but reversible heart problems, such as irregular heartbeat. Finally, Lyme disease can result in a disabling, chronic type of arthritis that most often affects the knees. Treatment is more difficult and less successful in later stages. The effects of Lyme disease can be confused with other medical problems.

It is recommended that personnel check themselves when in areas that could harbor ticks, wear light color clothing and visually check themselves and their buddy when coming from wooded or vegetated areas. If a tick is found biting an individual, the SSHO will be contacted immediately. The tick can be removed by pulling gently at the head with tweezers. The affected area should then be disinfected with an antiseptic wipe. The employee will be offered the option for medical treatment by a physician, which typically involves prophylactic antibiotics. If personnel feel sick or have signs similar to those above, they will notify the SSHO immediately. Effort should be made to save the tick and bring it with the affected employee for positive identification.

4.3.2 Wild Animal Hazard Identification and Mitigation

During site operations, contact with rats, mice, dogs, cats, possums, or raccoons could occur. These animals may carry rabies and should be avoided. Intimate contact with rodents is more likely to occur in and around occupied housing areas where ample food is present and more dense rodent populations are expected. Other animals such as foxes, coyotes, cougars, and bears may be present though an encounter with one of these animals is unlikely.

Workers will use discretion and avoid all contact with rodents, will not feed wild animals, and will discard food waste and lunchroom trash in proper receptacles with covers. Although not anticipated, if these animals present a problem or if significant rodent populations are encountered, the PESM will be notified who will develop a plan to alleviate the problem.

4.3.3 Bloodborne Pathogen Hazard Identification and Mitigation

Bloodborne pathogens enter the human body and blood circulation system through punctures, cuts, or abrasions of the skin or mucous membranes. They are not transmitted through ingestion (swallowing), through the lungs (breathing), or by contact with whole,

healthy skin. However, under the principle of universal precautions, all blood should be considered infectious, and all skin and mucous membranes should be considered to have possible points of entry for pathogens. Two primary bloodborne pathogens include Hepatitis B and human immunodeficiency virus (HIV)/acquired immune deficiency syndrome (AIDS).

Potential bloodborne pathogen exposures include:

- Contact with contaminated medical equipment or medical waste or sharps
- Medical emergency response operations such as administering first aid or CPR

To reduce the risk of contracting a bloodborne pathogen, take the following precautions:

- Avoid contact with blood and other bodily fluids
- Use protective equipment when giving first aid/CPR, such as disposable gloves and breathing barriers
- Thoroughly wash your hands with soap and water immediately after giving care

When cleaning up blood or other bodily fluids:

- Clean up the spill immediately or as soon as possible after the spill occurs
- Use disposable gloves and other PPE when cleaning spills
- Wipe up the spill with paper towels or other absorbent materials
- After the area has been wiped up, flood the area with a solution of ¼ cup of liquid chlorine bleach to 1 gallon of fresh water and allow it to stand for at least 20 minutes
- Dispose of the contaminated material used to clean up the spill in a labeled biohazard container

There is a vaccine for Hepatitis B. Should there be an exposure scenario (e.g., a first aid or CPR incident), and employees who are not already inoculated desire the vaccine, Tetra Tech will arrange to have the employee receive the series of inoculations in accordance with Procedure EHS 4-1. If the employee declines the vaccine, Tetra Tech will ensure that the declination form (also provided in EHS 4-1) is signed by the employee after they are counseled about the vaccine and their right to getting the inoculations after an exposure scenario. While less efficient, the Hepatitis B vaccine is effective when administered after exposure to blood containing the Hepatitis B virus. The SSHO should be notified of any potential contact with blood or bodily fluids resulting from first aid or CPR administered on the job. Site personnel will be given bloodborne pathogens training.

4.3.4 Poisonous Plant Hazard Identification and Mitigation

The potential for contact with poisonous plants exists when performing fieldwork in undeveloped and wooded areas. Poison ivy and oak may be present on site. These poisonous plants have an oily substance on their leaves and within the plant root and stem that is called urushiol. Skin contact with urushiol can cause a severe rash. Urushiol is not a singular chemical but rather contains a number of different chemicals. These chemicals penetrate the skin and stimulate an allergic reaction within 15 minutes after contact with the skin. Since the toxic substance causes a rash, urushiol should be managed and handled as if it were a hazardous chemical.

Poison ivy can be found as vines on tree trunks or as upright bushes. Poison ivy consists of three leaflets with notched edges. Two leaflets form a pair on opposite sides of the stalk, and the third leaflet stands by itself at the tip. Poison ivy is red in the early spring and turns shiny green later in the spring. Poison oak can be present as a sparingly branched shrub. Poison oak is similar to poison ivy in that it has the same leaflet configuration; however, the leaves have slightly deeper notches.

Contact with poison ivy or poison oak may lead to a skin rash in susceptible individuals. The rash is characterized by reddened, itchy, blistering skin that needs first aid treatment. If you believe you have contacted one of these plants, immediately wash skin thoroughly with soap and water, taking care not to touch your face or other body parts. The SSHO will review Procedure HSG 2-8, Poison Ivy, Oak, and Sumac Contamination Control, during orientation training. Barrier cream and soap will be available in the first aid kit carried into the field. Avoidance of plant/sap contact is the only effective means of preventing the poisoning. A person experiencing symptoms of poisoning should remove contaminated clothing; wash all exposed areas thoroughly with soap and water, taking care not to touch your face or other body parts. Apply calamine or other poison ivy/oak lotion if the rash is mild. Seek medical advice if a severe reaction occurs, or if there is a known history of previous sensitivity. Employees will be trained in the identification of these species and will be advised to wear protective clothing such as gloves and long sleeve shirts when working conditions permit. Employees should also consider applying barrier lotions to the skin that has potential to contact these species.

4.4 ACTIVITY HAZARD ANALYSIS

[See Section 10.0 and Attachment 6 of the APP]

5.0 TRAINING AND QUALIFICATIONS

[See Section 6.0 of the APP]

6.0 SITE CONTROL ZONES

Site control zones are intended to control the spread of potential contamination throughout the site, protect the public, and to ensure that only authorized individuals are permitted into potentially hazardous areas. Because there are no anticipated chemical hazards related to contaminants of concern during the small excavation and sampling tasks, there are no established control zones that will be required for this project. An exclusion zone, contamination reduction zone and support zone are not required.

Workers will wear nitrile gloves during sampling to keep soil off hands and for integrity of the sampling procedures. Workers will implement good hygiene practices of hand and face washing when leaving the work area at the end of shift or before eating, drinking, or smoking in designated areas; and will use best management practices to control fugitive dust emissions.

7.0 PERSONAL PROTECTIVE EQUIPMENT

The PPE specified in this plan represents the hazard analysis and PPE selection required by 29 CFR 1910.132. For the purposes of PPE selection, the PESM and SSHO are considered Competent Persons. The signatures on the approval page of the APP constitute certification of the hazard assessment. The basic PPE to be worn at all times for general site work includes hard hat (when overhead hazard, potential for flying debris, or construction equipment operation hazard exists), safety glasses with side shields, high-visibility vest, long pants, a three-quarter sleeve length shirt, leather work gloves as appropriate, and safety-toed boots. For sampling of soil, nitrile gloves will be worn in accordance with the sampling and analysis plan.

At the present time, there are no anticipated conditions that will result in contact with contaminated soils or any need for use of respiratory protection. Use of a personal floatation device is required if working within 6 feet of water that is 1 foot or deeper unless otherwise approved by the PESM.

All PPE will be visually inspected before and after each use for signs of damage and will be cleaned and maintained regularly. Any PPE items found to be damaged or excessively worn will not be used, and replacement PPE items will be worn.

Potential hazards can be minimized or eliminated by following good work practices, proper use of PPE, and maintaining good personal hygiene.

PPE selection for various work activities has been made in consultation with the PESM and is included in Table 7-1. Any changes will be approved by the PESM and Contracting Officer and will be documented through the Design Change Notice (DCN) process described in the Work Plan. The initial levels of protection for tasks were selected by performing a hazard assessment (see Section 4.2), taking into consideration the following:

- Potential chemical and physical hazards present or suspected
- Published exposure limits (Occupational Safety and Health Administration [OSHA] and American Conference of Governmental Industrial Hygienists)
- Work operations to be performed
- Potential routes of exposure
- Characteristics, capabilities, and limitations of PPE, and any hazards that the PPE presents or magnifies

It should be noted that this SSHP makes provisions for adjustment of protection levels based on contaminants that are anticipated at the site. Protection levels may be upgraded or downgraded based on physical conditions (e.g., generation of dust, presence of unanticipated waste or evidence of contamination) on site. Changes in protection levels will be made in accordance with the following criteria:

Reasons to Upgrade:

- Known or suspected presence of dermal hazards
- Occurrence or likely occurrence of gas or vapor emission
- Change in work task that will increase contact or potential contact with hazardous materials
- Request of the individual performing the task

Reasons to Downgrade:

- New information indicating that the situation is less hazardous than originally thought
- Change in site conditions that decrease the hazard
- Change in work task that will reduce contact with hazardous materials

On-site emergency equipment is discussed in Section 9.0 of the APP.

Table 7-1. Personal Protective Equipment Selection

Task	Head	Eye/Face	Feet	Hands	Body	Hearing	Respirator
1. Mobilization / Demobilization	HH ^{1/}	SG	STB	LWG as needed	WC/RG	EP as needed	NA
2. Wetlands Delineation	HH ^{1/}	SG	STB	LWG as needed	WC/RG	EP as needed	NA
3. Soil Sampling	HH ^{1/}	SG	STB	Nit	WC/RG	EP as needed	NA

Notes:

^{1/} If overhead hazard exists

PFD required if working within 6 feet of open water unless otherwise approved by the PESM.

EP – ear plugs

RG – rain gear

LWG – leather work gloves

SG – safety glasses

NA – not applicable

STB – safety-toed boots (leather or rubber for mud)

Nit – nitrile gloves

WC – work clothes

8.0 MEDICAL SURVEILLANCE PROCEDURES

The LHTR has been recommended for no further action following several studies to evaluate site contamination which has determined that there is no human health or ecological risk for lead or any other munitions related constituent. Exposure to any of the contaminants (namely lead) is not anticipated to occur based on prior investigation sample data and the nature of the work being performed during this project which will not present opportunity for routes of exposure to occur unless previously unidentified waste areas are discovered. Because exposure to contaminants is not anticipated during project activities, personnel performing fieldwork at the site are not required to have passed a complete medical surveillance examination in accordance with 29 CFR 1910.120(f).

All on-site personnel will be encouraged to complete the medical data sheet provided in Attachment A. The medical data sheet is intended to provide basic information that would be useful to professional medical personnel if medical treatment or transport to emergency medical facilities is required. Where possible, this medical data sheet will accompany the personnel needing medical assistance. The medical data sheet will be maintained in a secure location by the SSHO, treated as confidential, and used only on a need-to-know basis.

9.0 ENVIRONMENTAL AND PERSONNEL MONITORING

Because exposure scenarios above PELs are not anticipated for project tasks, exposure monitoring will not be conducted. However, in the event site personnel identify potential contaminants, the SSHO will discuss the potential for exposure monitoring with the program CIH and exposure monitoring may be implemented if workers need to enter previously unidentified contaminated areas to perform wetlands delineation or sampling tasks.

The chemical exposure risk to workers during field work is also anticipated to be minimal because of the following:

- There is low potential for physical contact with any potentially contaminated soils/sediment because of limited disturbance of the ground overall.
- The site was recommended for no further action related to chemicals of concern.
- Volatile contaminants are not anticipated to be encountered that could impact the workers breathing zone during these operations.
- Dust generation will be minimal for any of the tasks.
- Good hygiene practices and proper use of PPE will also help minimize exposure potential in the unlikely event there is some contamination in soil being sampled. Decontamination is addressed in Section 11.0 and sanitation facilities are addressed in Section 13.0.

Should any conditions change or the potential need for additional monitoring be identified (e.g., discovery of visually contaminated areas, strong odors, or waste), the SSHO will coordinate with the PESM to evaluate the potential for worker exposure, upgrades/downgrades in level of protection, and whether personnel or real-time exposure monitoring should be performed.

10.0 COMMUNICATIONS

The buddy system is used for all field activities where work is being performed. Tetra Tech performs the buddy system in this manner for all fieldwork.

10.1 TELEPHONES

Routine site communications will take place face-to-face and/or via cellular telephones. The FOL and SSHO will have cellular telephones for communication with outside contacts and the SSHO will ensure that the communications are tested to ensure sufficient signal strength in the areas being worked in. Emergency numbers will be maintained by the SSHO and posted in the project vehicle and will be carried in the field by the SSHO and FOL. Because there will only be one work crew of three people, there will be no members of the team working in other areas. The team will stay as a group for all activities on this project.

10.2 AIR HORNS

These will be maintained on the SSHO for initiation of emergency evacuation procedures if required, though with only one team and the buddy system, face-to-face communications are likely sufficient. One long blast on an air horn or vehicle horn will communicate emergency evacuation. Air horns can also be used to signal emergency workers (should rescue be required) of your location.

11.0 PERSONNEL AND EQUIPMENT DECONTAMINATION

The only formal decontamination required during this project is that required by the Sampling and Analysis Plan, and only if non-disposable sample equipment is used. As a good housekeeping practice, workers will wash off boots and remove muddy raingear before entering the site vehicle. As discussed in Section 4.2.2, naturally occurring arsenic may be present in the soils at this site, though not in concentrations where workers will be exposed above the PEL. Workers will have access to a hand-washing station (fresh bottled potable water, soap, and paper towels at a minimum) where they will wash their hands before eating or smoking. Smoking and eating areas will be designated by the SSHO and will not be located in the active work area. In addition, the guidance in the bullets below will also help keep potential exposures to arsenic at a minimum level.

The best line of defense for protection of personnel during the project activities is to practice good hygiene practices and procedures as follows:

- Keep street clothing (clothing to be worn home) clean of mud
- Control fugitive dust
- Wear nitrile gloves while sampling
- Leave work clothing such as leather work gloves in a dedicated equipment storage room and do not take them home or into offices or lunch/break rooms
- Doff dirty work clothing before leaving work and launder work clothing (e.g., coveralls) separately from household laundry
- Brush off boots
- Wash hands and face before leaving work area and when going on break to eat, drink, or smoke

12.0 EMERGENCY RESPONSE PLAN

[See Section 9.1 of the APP]

13.0 SANITATION

13.1 POTABLE WATER

An adequate supply of potable water will be maintained available in the project vehicle and on the project team to be available on a daily basis. Disposable cups may be used if the bottled water container is equipped with a tap. Disposable bottled water containers will not be refilled for reuse. Larger containers of potable bottled water will also be available for use as hand washing stations. The SSHO will ensure the field teams carry sufficient water and electrolyte fluids (e.g., Gatorade) into the field. Additional water will be available in the project vehicle for refilling as needed.

13.2 HAND WASHING FACILITIES

A hand washing station will be established at the site vehicle and in the field for hand washing prior to eating or drinking and following collection of soil samples. At a minimum, this station will consist of potable water in a tap dispenser, soap, and paper towels. Sanitary alcohol wipes or gel may also be provided, but not as a substitute for soap and water. A trash bag will also be provided for trash where it can be collected and managed.

13.3 TOILET FACILITIES

Toilet facilities are not present on the work site. There is a gas station, restaurant, and store in the town of Greenbank at 25189 Washington Route 525, which is about 1 mile to the south/southeast, and each of these locations has a public restroom. A site vehicle will be available to access these facilities.

14.0 LOGS, REPORTS, AND RECORDKEEPING

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

14.1 MEDICAL AND TRAINING RECORDS

Copies or verification of training (30-hour, 8-hour, site-specific training) will be maintained on site. Also see Section 6.0 of the APP. Subcontractors are not currently anticipated to be needed to accomplish the project, but should the need arise, records for all subcontractor employees will also be maintained on site. All Tetra Tech employee medical records will be maintained by the appropriate Corporate Medical Consultants (CMCs).

14.2 ON-SITE LOG

The SSHO or designee will keep a daily log of personnel on site. A daily deficiency log as required by EM 385-1-1, Section 01. A.12.d, will be maintained in the site field office.

14.3 WEEKLY AND MONTHLY SAFETY REPORTS

The SSHO shall complete and submit weekly and monthly health and safety reports and will maintain them on site and provide copies to the PESM. The report forms are provided in Attachment 5 of the APP.

14.4 EVENT REPORTS

See Sections 8.2 and 8.3 of the APP. Copies of these reports will be maintained in the project vehicle.

14.5 OSHA FORM 300

The project fieldwork is not currently anticipated to last more than 3 weeks. If project needs change and the project is anticipated to exceed 3 months duration for fieldwork, an OSHA Form 300 will be kept at the project site. All recordable injuries or illnesses will be recorded on this form. At the end of the project, the original will be sent to the PESM for maintenance. Subcontractor employers must also meet the requirements of maintaining an OSHA Form 300. The Event/Near Miss Reporting and Investigation Form, APP Attachment 5, meets the requirements of the OSHA Form 301 (supplemental record) and must be maintained with the OSHA Form 300 for all recordable injuries or illnesses.

14.6 HEALTH AND SAFETY LOGBOOKS

The SSHO will maintain a health and safety logbook during site work. The daily site conditions, task information, and significant events will be recorded. The original logbooks will become part of the project file.

14.7 WORK PERMITS

All work permits (as required) will be maintained by the SSHO in the project files in the project vehicle.

15.0 REFERENCES

USACE (U.S. Army Corps of Engineers). 2008. Safety and Health Requirements Manual, Engineering Manual (EM) 385-1-1, Washington, DC. September 15.

Tetra Tech NUS. 2011. Feasibility Study Report for Lake Hancock Target Range. October 2011.

Site Safety and Health Plan
Contract N62470-08-D-1008
Task Order JP01
NAS Whidbey Island, WA

Final
August 8, 2012

ATTACHMENT A

CONTACT AND MEDICAL DATA SHEET

**Contact & Medical Data Sheet
(Voluntary)**

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

Name: _____ **Date:** _____

Home Phone: _____

Age: _____

Name of Emergency Contact: _____

Emergency Contact Phone #: _____

Drug Allergies or Other Allergies: _____

Do You Wear Contacts? _____

Are there any Recent Major Illnesses or On-going Medical Conditions that we should be aware of? _____

What Medications are you presently using? _____

Do you have any medical restrictions? _____

Personal Physician Name: _____

Address: _____

Phone #: _____

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

Accident Prevention Plan
Contract N62470-08-D-1008
Task Order JP01
NAS Whidbey Island, WA

Final
August 8, 2012

ATTACHMENT 2
RESUMES OF PROJECT PERSONNEL

EXPERIENCE SUMMARY

Ms. Peace is a biologist with over 12 years of experience in natural resource research, writing, and consulting. She has managed transmission, gas pipeline, wind energy, hydropower, transportation, flood risk management, wetland mitigation, habitat restoration, and biological studies projects. She has worked on various projects involving biological species surveys, noxious weed management, plant community mapping, erosion and sediment control, natural resources planning, natural resources permitting, and wetland delineations. Ms. Peace has experience designing and conducting studies for both private and public sector clients that require large and small mammal trapping, herpetological trapping and surveys, mammal tracking, radiotelemetry, GPS data collection, federally-mandated protocol surveys, botanical identification, noxious weed inventories, remote sensing cameras, scent stations, transect sampling, erosion and sediment control device prescriptions, and/or point counts. She has also been involved with several projects addressing terrestrial and aquatic connectivity. She has successfully procured state and federal water, wetland, storm water/erosion, and USFS permits, NPDES permits, state water permits, transmission line state certifications, and US Army Corps of Engineers (ACOE) 404/401 permits to support various projects in New York, Ohio, California, Oregon, and Pennsylvania. Mitigation and restoration experience includes a variety of habitats, such as wetland, riparian, grassland, desert, and forest.

EDUCATION

- M.A. Conservation Biology, University of Colorado, Boulder, CO, 2002. “The effects of pH on the boreal toad and chytrid fungus pathosystem”
- B.S. Wildlife Science, Quantitative Science minor, College of Forest Resources, University of Washington, Seattle, WA, 1999.

ADDITIONAL TRAINING

- 2011 Project Management Level 2 Training
- 2010 FERC Environmental Review and Compliance for Natural Gas Facilities Seminar
- 2008 Principles of Streambank Analysis and Stabilization
- 2008 Introduction to River Restoration, Part II: Ecological Processes
- 2008 Basic Wetland Delineation Training
- 2005 Desert Tortoise Handling Workshop
- 2005 California Environmental Quality Act (CEQA) Training

REPRESENTATIVE PROJECTS

Biological and Botanical Experience

Indiana Bat Surveys, Marine Corps Reserve Center Syracuse, Naval Facilities Engineering Command Midland, Syracuse, New York. Managed project that included protocol surveys by Bat Conservation Management, Inc. (BCM) pursuant to the United States Fish and Wildlife Service Guidelines for Indiana Bat Mist Net Surveys for two nights at the Marine Corps Reserve Center in Syracuse New York. Managed acoustic monitoring for twelve week time period, data collection, and report writing for both mist net and acoustic monitoring efforts. Participated in project meetings and provided regular project status updates.

Indiana Bat Surveys, U.S. Army Corps of Engineers New York District, Green Brook Flood Damage Reduction Project, Middlesex, New Jersey. Assisted Bat Conservation Management, Inc. (BCM) with protocol surveys pursuant to the New Jersey United States Fish and Wildlife Service Field

Office Guidelines for Indiana Bat Mist Net Surveys within Areas Affected by White Nose Syndrome for two nights along Green Brook in Middlesex County. No Indiana bats were captured. Big brown (*Eptesicus fuscus*) and little brown (*Myotis lucifugus*) bats were captured, processed, and released.

Water Resources Evaluations, Gas Pipeline Replacement Project, East Ohio Gas Company, Ravenna, Ohio. Performed Primary Headwater Habitat and Qualitative Habitat Evaluations for eight streams in Ohio. Data was collected on substrate, maximum pool depth, bank full width, riparian zone and floodplain quality, flow regime, sinuosity, stream gradient, drainage area, and water quality. Biotic evaluations were also conducted for each stream to determine presence and abundance of fish, amphibians, and aquatic macroinvertebrates. Aquatic Life Use Designations were assigned based on metric scores calculated for each stream. Evaluations were conducted in support of an Ohio Environmental Protection Agency 401 Water Quality Certification Application for the proposed project.

Threatened and Endangered Species Habitat Assessment, APD Engineering, Retail Development Project, Gloversville, New York. Performed habitat assessment for threatened and endangered species for a retail development project. Focused assessment for bald eagle suitable habitat, including nesting, perching, wintering, and foraging habitat.

Rare, Threatened and Endangered Butterfly and Botanical Species Surveys, Sparrows Point Project, Pennsylvania and Maryland. Performed focused surveys along a pipeline right-of-way for rare butterflies and plant species in consultation with government agencies and client stakeholders. Identified appropriate habitat and recorded plant and wildlife species observed.

Rare, Threatened, and Endangered Wildlife and Plant Species Surveys, PacifiCorp Energy, North Umpqua Hydroelectric Project, Oregon. Served as environmental compliance coordinator and task lead for environmental clearance tasks. Conducted wildlife and plant species clearance surveys in consultation with the US Forest Service (USFS) for various projects, including installation of erosion control structures, transmission and distribution line vegetation maintenance projects, reservoir dredging, wetland creation and enhancement, habitat restoration, and capital construction projects. Performed protocol surveys for Survey and Manage mollusk species in appropriate habitat.

Noxious Weed Program, PacifiCorp Energy, North Umpqua Hydroelectric Project, Douglas County, Oregon. Served as project manager for development and implementation of a noxious weed training program as required by federal agencies for foresters, line workers, hydro workers, and contractors. Produced a noxious weed photo-identification booklet, noxious weed reporting form, and noxious weed training presentation. Trained personnel on an annual basis to fulfill compliance requirement. Coordinated training and development of materials with PacifiCorp implementation staff, as well as operations and maintenance staff. Developed noxious weed treatment plans and schedules for all priority noxious weed infestations within the FERC project boundary in consultation with the BLM and USFS. Coordinated implementation of noxious weed control activities. Treated noxious weed infestations as necessary to prevent spread of noxious weeds. Performed noxious weed risk assessments and took appropriate action prior to ground disturbing actions. Coordinated updates to noxious weed maps and GIS information. Managed release of RFP for periodic project noxious weed inventory.

Habitat and Aquatic Connectivity Enhancement Project, PacifiCorp Energy, North Umpqua Hydroelectric Project, Douglas County, Oregon. Served as project manager for development of an Aquatic Connectivity Plan and Project. Contributed to numerous discussions between the client, the USFS, and Oregon Department of Fish & Wildlife (ODFW) to negotiate intercepted tributaries and drainages to be re-connected pursuant to project relicensing requirements. Assisted with client procurement in selecting an engineering firm for production of conceptual engineering designs to support aquatic connectivity project. Provided project management, design input, meeting coordination, and permitting services in support of the aquatic connectivity project. Successfully procured an ACOE 404/401 for twelve connectivity structures. Provided subject matter expert support to guide development of designs that will encourage use by amphibians and macroinvertebrates. Performed multiple site assessments with agency personnel to determine site suitability, erosion risk, and stream width

measurements. Performed stream data collection (substrate, average immobile particle, and limits of construction) to guide site specific conceptual design development.

Horticultural Invasive Species Removal Project, PacifiCorp Energy, North Umpqua Hydroelectric Project Residential and Administrative Areas, Douglas County, Oregon. Served as project manager and program developer to assist client with compliance needs. Developed an informational photo-identification booklet in consultation with USFS botanists to educate PacifiCorp staff and residents regarding invasive garden species. Generated removal plans and methods approved by USFS staff and presented information to residents. Responded to resident concerns. Performed and managed plant removal, herbicide application, solarization, and terrace building with subcontractors.

Bat Surveys, Bridge Repair Projects along the Los Angeles Aqueduct, County of Los Angeles, California. Served as a team biologist to assess the presence of bats during two surveys for each of three bridges. Assisted with reporting and recommendations to client for mitigation of potential impacts.

Stephen Kangaroo Rat Construction Monitoring, Highway Repair Project, California Department of Transportation, San Bernardino County, California. Conducted construction monitoring as required by California Department of Fish and Game for protection of Stephens kangaroo rat (*Dipodomys stephensi*) and its habitat. Wrote monitoring reports and made recommendations for species protection.

Rare, Threatened, and Endangered Species Surveys, Highway Repair Projects, California Department of Transportation, San Bernardino County, California. Managed three projects and assisted with five others as part of an on-call services contract for environmental services. Performed surveys and habitat assessments for rare, threatened, and endangered species within project areas. Conducted protocol surveys for desert tortoise (DT; *Gopherus agassizii*), Mohave ground squirrel (MGS; *Spermophilus mohavensis*), and arroyo toads (*Bufo californicus*) when habitat was present. Gained handling experience with MGS; positively identified and located DT sign and individuals. Wrote Biological Technical Reports, Biological Evaluations, Biological Assessments, and Natural Environment Studies to document findings to the client.

Environmental Compliance Services, Wind Energy Projects, Various Clients, Kern County, California. Served as project manager on a major wind development project in southern California. Also served as assistant project manager on another wind energy project. Managed subcontractors and internal staff to assist clients with environmental compliance and preparation of NEPA/CEQA documentation. Performed sensitive plant and wildlife species surveys in support of a wind energy project. Prepared invoices, status reports, and revised schedules regularly. Performed agency coordination, client communication, and internal team management.

Large mammal trapping, Habitat Connectivity Project, California Department of Transportation, San Bernardino County, California. Served as assistant project manager for habitat connectivity study in southern California. Placed Collarums and Tomahawk traps to trap coyotes and bobcats, respectively. Captured animals were fitted with radio collars. Telemetry data collected was used to inform habitat connectivity and ecological effects of mesopredators on prey populations of concern. Monitored remote cameras, tracking, and scent stations to further inform species movements. Project work also included extensive coordination with government agencies, other contractors, as well as client personnel.

River Otter Surveys and Lynx Trapping Project, Wildlife Services Contractor, Statewide Colorado. Served as a team biologist on two major projects in Colorado that included snow tracking, trap placement and maintenance, river otter surveys, radio telemetry, track and sign identification, location collection with GPS. Successfully trapped lynx to replace radio collars, DNA samples, and individual health assessment data.

Habitat Restoration

White Mule Creek Habitat Restoration, PacifiCorp Energy, North Umpqua Hydroelectric Project, Douglas County, Oregon. Served as habitat restoration task manager for riparian restoration project.

Installed over 4,000 native plants as part of a habitat restoration plan, including 200 ponderosa pine, 200 thimbleberry, 100 blue elderberry, 12 Douglas fir, 500 willow stakes, 500 squawcarpet rhizome segments, and 3,000 squirrel tail grass plugs. Installed plants in suitable microsites with respect to slope, moisture and temperature regime, and sun exposure. Monitored success of native plantings and presence of invasive weed species. Mulched site with certified weed-free native straw for moisture retention and erosion control. Coordinated extensively with agency personnel and subcontractors regarding mitigation monitoring reports and permit closure.

Fish Creek Canal Shutoff and Drainage Sites Habitat Restoration, PacifiCorp Energy, North Umpqua Hydroelectric Project, Douglas County, Oregon. Wrote detailed planting plan for this post-construction habitat restoration site that included species to be used, spacing intervals, and rooting depth. Directed installation of erosion control structures by a subcontractor due to extremely steep (30%) slope and creek below. Adapted to constantly changing construction timeline and unexpected challenges to meet revegetation goals and deadline. Managed installation of 700 whitethorn plugs, and 200 ponderosa pine seedlings during fall 2007. Mulched slope with certified weed free native straw to further prevent erosion, control sediment, and maintain moisture for newly installed plantings. Monitored site for erosion, noxious weed presence, and success of revegetation efforts. Augmentation planting included 400 madrone seedlings installed during spring 2008, and 448 transplanted seedlings of various conifer and hardwood species during fall 2008.

Fish Creek Fish Screen Project Wetland Mitigation and Habitat Restoration, PacifiCorp Energy, North Umpqua Hydroelectric Project, Douglas County, Oregon. Served as project manager of restoration and mitigation planting project. Coordinated development and production of planting plan by subcontractor, with extensive reviews and iterations to result in quality document for PacifiCorp compliance records. Coordinated with subconsultants, construction crews, project managers, O&M staff, inspectors, and agency personnel to implement complex planting plan. Constantly adjusted to changes in schedule due to permitting delays and unforeseen circumstances. Directed soil elevations to result in suitable wetland planting area to fulfill mitigation obligations. Collected wetland plants from USFS-approved transplant source areas for wetland mitigation plantings and directed installation of 790 wetland plants into a created wetland zone. Directed and participated in the planting of four other zones, including upland areas, riparian areas, and an additional wetland enhancement area. Monitored mitigation success and establishment of native vegetation.

Habitat and Aquatic Connectivity Enhancement, Stump Lake Amphibian Connectivity Ramp, PacifiCorp Energy, North Umpqua Hydroelectric Project, Douglas County, Oregon. Contributed to design and installation of aquatic connectivity structure. Developed Revegetation Plan to improve habitat and encourage use by target species while maintaining compliance with FERC and USFS requirements. Coordinated with USFS botanists to ensure compliance with genetic guidelines and to verify suitability of selected plant species to expected physical regimes at the site. Installed over 100 native plants, including wetland grasses, shrubs, and willows. Hand-shaped streambed to encourage use by amphibians and macroinvertebrates.

Habitat Restoration, Soda Springs Fish Passage Project, PacifiCorp Energy, North Umpqua Hydroelectric Project, Douglas County, Oregon. Initiated development of a detailed revegetation plan for riparian and upland areas expected to be impacted by the Soda Springs Fish Passage Project. Coordinated with USFS botanists and silviculturist, as well as client operations and maintenance staff to ensure compatibility with USFS genetic guidelines and protection of facilities.

Wetland Delineation, Mitigation, and Monitoring

Wetland and Waterbody Resources Delineations, NAVFAC, Marine Corps Reserve Center, Syracuse, New York. Managed wetland and water resources delineation efforts for 263 acre Marine Corps Reserve Center in Syracuse, New York. Coordinated field crews and increased efficiency of effort

through verification or revisions to previously delineated wetland boundaries. Performed QAQC of all field data, coordinated access, and managed compilation, submittal, and coordination with the NYDEC and USACE for wetland verification and preliminary jurisdictional determinations.

Wetland and Waterbody Resources Delineations, Flood Risk Management Project, U.S. Army Corps of Engineers New York District, Mamaroneck and Sheldrake Rivers, Westchester County, New York. Assisted with management of wetland and water resources delineation efforts for a flood risk management project in a densely-populated high-risk flood zone area. Coordinated field crews and work flow, rights of entry compliance and coordination, and collection of additional information to support the development of a Draft Environmental Impact Statement for the project.

Wetland and Waterbody Resources Delineations, Transmission Line Rebuild Projects, National Grid, Western New York. Managed wetland and water resources delineation efforts for two large-scale transmission line rebuild projects totaling approximately 100 miles in western New York. Coordinated field crews and work flow, performed QAQC of all field data, compiled data sheets, and authored Wetland and Waterbody Delineation Reports suitable for submittal to the New York Department of Environmental Conservation (NYDEC) and the USACE in support of project permits.

Macedon Wetland Mitigation Monitoring, Wal-Mart, Macedon, New York. Led 2009 and 2010 mitigation monitoring and wetland delineation efforts at a wetland creation site in central New York. Collected detailed information on wetland and open water boundaries, restoration success, plant survival, wetland community development, hydrology measurements, noxious weeds, and wildlife use of the mitigation area. Provided recommendations for ensuring success of the mitigation project and maintaining compliance with the USACE-issued project permit.

Wetland and Waterbody Identification Survey Management, Marine Corps Base Camp Lejeune, North Carolina. Assisted with management of over 9,000 acres of wetland delineation and verification efforts in riverine and coastal wetlands within Marine Corps Base Camp Lejeune and associated installations. Coordinated field efforts with internal staff, local field delineators, professional land surveyors, Marine Corps Base staff, and U.S. Army Corps of Engineers, Wilmington District personnel to obtain official signed plats for Jurisdictional Determinations.

Wetland and Waterbody Identification Surveys, Gas Pipeline Replacement Projects, East Ohio Gas Company, Various Counties, Ohio. Performed wetland delineation and waterbody identification surveys for several gas pipeline replacement projects in various counties in Ohio to support environmental compliance permitting. Areas were evaluated for the presence and extent of wetlands using the routine, Level-2 determination method described in the Corps of Engineers Wetlands Delineation Manual and/or the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, Midwest Region, and/or Eastern Mountains and Piedmont Region.

Elmsford Wetland and Waterbody Delineation, APD Engineering, Retail Development Project, Elmsford, New York. Performed wetland and waterbody delineations for a retail development project using the 1987 USACE Wetlands Delineation Manual. Provided wetland and water resources site-specific information regarding planting communities, soils, hydrology, waterbody sinuosity, substrate, bank structure, and habitat values.

Cove Point Wetland Mitigation and Stream Restoration Monitoring, Harmontown, Potter County, Pennsylvania. Conducted mitigation monitoring annually between 2009 and 2011 for a natural gas pipeline project as required by Pennsylvania Department of Environmental Protection Permit of a mitigation wetland and stream restoration project near the Middle Branch Genesee River. Collected data on botanical species diversity, percent vegetative cover, development of wetland soil characteristics, restoration planting success, and stability of stream restoration structures. Authored mitigation monitoring report that included recommendations for mitigation success. Collected GPS data for updated As-Built drawings reflecting supplemental plantings.

Potsdam Wetland Mitigation Monitoring, Wal-Mart, Potsdam, New York. Led in 2010 and assisted in 2009 with wetland mitigation monitoring at a wetland creation and enhancement site in northern New York. Collected detailed information on wetland boundaries, restoration success, plant survival, noxious weeds, and species use of the wetland area. Provided recommendations for ensuring continued success of the mitigation project and maintaining compliance with the USACE 404/401 project permit.

Stump Lake Wetland Enhancement, PacifiCorp Energy, North Umpqua Hydroelectric Project, Douglas County, Oregon. Served as wetland enhancement task manager for wetland mitigation project. Installed over 700 native plant species to enhanced wetland project aimed at increasing stillwater amphibian breeding habitat. Installed 650 willow stakes, 54 Engelmann spruce seedlings, and 35 transplanted conifer seedlings. Planted emergent wetland, subshrub wetland, and forested wetland habitat types. Monitored success of plantings as well as success of project goals and native amphibian species recruitment. Coordinated with USFS botany and silviculture personnel to ensure that genetic guidelines for revegetation projects on the Umpqua National Forest were met.

Lemolo Lake Wetland Creation, PacifiCorp Energy, North Umpqua Hydroelectric Project, Douglas County, Oregon. Developed detailed Revegetation Plan for creation of wetland mitigation project near Lemolo Lake. Revegetation Plan included a summary of existing plant species and habitat type, description of expected planting zones after construction, and recommendations for plant species and spacing intervals for revegetation efforts. Transplanted various native plant species to ensure that genetic guidelines were met, as well as to provide an economic solution to availability of native plant materials. Secured cost effective labor force for plant installation. Managed, supervised, and participated in the installation of 4,000 wetland grass plugs, 1,100 squawcarpet rhizome segments, 1,000 willow stakes, 400 aspen seedlings/cuttings, 200 ponderosa pine seedlings, and 100 Engelmann spruce seedlings. Monitored wetland creation project for success based on guidelines provided in Revegetation Plan.

Mitigation Monitoring Program Development, PacifiCorp Energy, North Umpqua Hydroelectric Project, Douglas County, Oregon. Developed mitigation and monitoring program to track the success of all revegetation projects implemented within the hydropower project area. Developed data forms and schedule for annual mitigation monitoring field work, permanent photo points, and methods for identifying necessary actions for continued success of mitigation projects. Coordinated with PacifiCorp personnel to develop an end-to-end monitoring system linked to GIS and mapping software. Implemented mitigation monitoring program and provided training for staff to ensure continued compliance with program goals.

Wetland Mitigation Site Identification Project, PacifiCorp Energy, North Umpqua Hydroelectric Project, Douglas County, Oregon. Assisted PacifiCorp implementation personnel with identification and field investigation of potential sites for wetland mitigation projects. Recorded data on site suitability based on access, hydrology, suitable topography, soils, vegetation, and presence of noxious weeds. Encouraged selection of degraded sites for restoration, and avoidance of sites containing intact functioning wetlands.

Ranawapiti Wetland Enhancement and Creation Project, PacifiCorp Energy, North Umpqua Hydroelectric Project, Douglas County, Oregon. Assisted PacifiCorp implementation personnel with site assessment, contractor management, project coordination, meetings, report reviews, and agency coordination.

Lemolo 1 Forebay Wetland Creation Project, PacifiCorp Energy, North Umpqua Hydroelectric Project, Douglas County, Oregon. Assisted PacifiCorp implementation personnel with site assessment, contractor management, project coordination, meetings, report reviews, and agency coordination.

Wetland Survey and Delineation, Fallen Mountain Creek, PacifiCorp Energy, North Umpqua Hydroelectric Project, Douglas County, Oregon. Assisted with wetland survey and delineation of Fallen Mountain Creek near the Lemolo 2 Forebay on the North Umpqua Hydroelectric Project. Federal jurisdictional wetlands were identified and delineated based upon the 1987 USACE Wetlands Delineation

Manual and the 2008 Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region.

Wetlands and Waters Surveys and Delineations, Weaver Road Project, Oregon. Assisted with wetlands and waters survey and delineations of proposed project areas to support installation of a new bridge over the Umpqua River. Federal jurisdictional wetlands were identified and delineated based upon the 1987 USACE Wetlands Delineation Manual and the 2008 Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region.

Environmental Permitting

Environmental Compliance Services, Lockport to Mortimer Line 111 and Gardenville to Dunkirk Lines 141/142 115 kV Transmission Line Rebuild Projects, National Grid, Western New York.

Currently serving as project manager for two large scale transmission line rebuild projects in western New York, totaling 101 miles. Managed field studies, including wetland delineations, waterbody identifications, habitat assessments, and development of erosion and sediment control planning for inclusion in the project specific Environmental Management and Construction Plan (EM&CP) required as part of the Article VII Certification Process overseen by the New York Public Service Commission. Duties also include obtaining a Clean Water Act Section 404 Permit from the U.S. Army Corps of Engineers, developing project-specific EM&CP Procedures, overseeing development of a Storm Water Pollution Prevention Plan pursuant to requirements for coverage under the General Permit for Construction Storm Water Discharge (NPDES), as well as managing and performing coordination with resources agencies such as the New York State Department of Environmental Conservation (NYSDEC), the New York Natural Heritage Program (NYNHP), the State Historic Preservation Office (SHPO), and the U.S. Fish and Wildlife Service (USFWS). Provided responses to Interrogatory Requests from agencies to support the Article VII Certification process, attended public meetings, and participated in the development of project alternatives. Authored Wetland Mitigation Plan to support EM&CP approval.

Draft Environmental Impact Statement for Mamaroneck and Sheldrake Flood Risk Management Project, U.S. Army Corps of Engineers New York District, Westchester County, New York.

Managed development of preliminary and public DEIS for flood risk management project involving potential channel grading and widening, retaining walls, mitigation features, bridge replacement, and underground tunnels to alleviate flooding issues in a densely populated area. Coordinated with internal and external team members, provided creative solutions to project challenges, and performed QAQC of all project documents and deliverables.

Environmental Compliance Services, Infrastructure Replacement Project, Dominion East Ohio Gas Company.

Currently assisting with environmental compliance services for a large-scale pipeline replacement project scheduled to replace over 4,000 miles of natural gas pipeline throughout the state of Ohio. Performed duties associated with the implementation of several subtasks designed to obtain all environmental clearances, authorizations, and permits for each project. Clearances include: USACE authorizations (NWP and Individual Permit), ESA and NHPA compliance with USFWS and SHPO consultation, Ohio EPA Water Quality Certification, Ohio EPA General Storm Water Permit, and Ohio EPA hydrostatic test water permit. Prepared USACE pre-construction notifications, wetland reports, cultural summary reports, USFWS habitat assessments, state wildlife consultations, and state NOIs and SWPPPs.

Environmental Compliance Services, Clearwater 2 Canal Shut-off and Drainage Project, PacifiCorp Energy, North Umpqua Hydroelectric Project, Douglas County, Oregon.

Served as project manager of permitting and restoration services. Contributed to project planning and development discussions with respect to environmental concerns. Successfully procured USFS approval, ACOE 404/401, and Oregon Department of State Lands (DSL) Removal Fill permits in support of the project. Supported procurement of an Oregon Department of Environmental Quality (DEQ) National Pollutant

Discharge Elimination System (NPDES) 1200-C construction storm water permit. Performed sensitive species clearance surveys for wildlife and plants. Developed Revegetation Plan in consultation with USFS botanists. Managed implementation of Revegetation Plan by subconsultants.

Environmental Compliance Services, Lemolo 2 Canal Shut-off and Drainage Project, PacifiCorp Energy, North Umpqua Hydroelectric Project, Douglas County, Oregon. Served as project manager of permitting and restoration services. Contributed to planning and development discussions with respect to environmental concerns. Successfully obtained USFS approval, ACOE 404/401, DSL Removal Fill, and DEQ NPDES 1200-C permits in support of the project. Performed sensitive species clearance surveys for wildlife and plants. Developed Revegetation Plan in consultation with USFS botanists.

Permitting and Environmental Services, Lemolo 2 Forebay Dredging Project, North Umpqua Hydroelectric Project, Douglas County, Oregon. Served as project manager of permitting services to support an operations and maintenance project to dredge the Lemolo 2 Forebay. Managed the preparation and submittal of permit applications for USFS approval, ACOE 404/401, and DSL Removal Fill permits. Coordinated with DEQ regarding need for NPDES 1200-C permit and confirmed that no 1200-C was necessary for the project due to Best Management Practices to be implemented during project operations. Assisted with conducting a wetland delineation of the project area and coordinated the avoidance of wetlands with the client project manager to facilitate the permitting process.

Permitting Services, Watson Ridge Communications Project, North Umpqua Hydroelectric Project, Douglas County, Oregon. Served as assistant project manager of permitting services to support installation of a communications tower and associated infrastructure on lands administered by the USFS. Successfully procured various federal, state, and county permits to support environmental compliance of the project. Also coordinated with agency personnel and led site visits to address timber, cultural and biological resource concerns.

Erosion and Sediment Control

Prescription of Erosion and Sediment Control Devices, National Grid Lockport Mortimer Line 111 Rebuild Project, Niagara, Orleans, and Monroe Counties, New York Prescribed temporary erosion and sediment control measures for approximately 56 mile long transmission line rebuild project to comply with New York State Article VII development guidelines for Environmental Management and Construction Plans and NYSDEC Storm Water Pollution Plan (SWPPP) development in compliance with the state General Permit for Construction Storm Water Discharge Activities. Managed the development of the SWPPP and submittal to NYSDEC. Submitted request for authorization to disturb greater than 5 acres pursuant to the General Permit.

Prescription of Erosion and Sediment Control Devices, East Ohio Gas Company PIR Program, Various Counties, Ohio Collected information on areas needing temporary best management practices (BMPs) for erosion and sediment control to protect water quality during construction for seven pipeline infrastructure (PIR) projects. Authored, submitted, and received approval of Storm Water Pollution Prevention Plans (SWPPPs) for twenty-seven PIR projects throughout Ohio in compliance with various requirements for sixteen different counties.

Erosion Control Plan Implementation, PacifiCorp, North Umpqua Hydroelectric Project, Douglas County, Oregon Assisted with implementation of the Erosion Control Plan required by the FERC license and associated Settlement Agreement for the North Umpqua Hydroelectric Project. Assisted with identification of areas of concern, prescriptions for remedial actions, and project management for procurement and permitting of prescribed action plans.

OTHER EXPERIENCE



The Cougar Fund, Jackson, Wyoming. Volunteered for non-profit group, assisting with various organizational tasks, mailings, filing, and administrative duties.

University of Colorado at Boulder, Teaching and Lab Assistant. Prepared lessons, laboratory instruction, grading, media prep, hemocytometry, histopathology, slide prep/staining, spectrophotometry, fungal culturing, pH adjustment, live animal care, wild amphibian surveys and capture.

University of Washington, Wildlife Lab, Anaerobe Microbiology Lab, Lab Assistant. Culturing, autoclaving, serum extraction, small mammal and amphibian dissections, live identification, small mammal and amphibian trapping for forest silviculture study, trained new employees.

PROFESSIONAL AFFILIATIONS

The Wildlife Society
Society for the Study of Amphibians and Reptiles

Experience Summary

Ms. Miller is a biologist with over 30 years of experience with government, non-profit and private organizations. She is certified as a Professional Wetland Scientist (PWS) by the Society of Wetland Scientists (SWS) with 12 years in the discipline of wetland ecology. Client services and responsibilities have included project and task management, field surveys, field crew supervision, report writing, recommendations in support of state, federal and local permitting, wetland and stream delineations, wetland functions assessments, topsoil analysis, noxious weed surveys, rare plant surveys, forest vegetation inventory, wildlife habitat surveys, environmental monitoring, planning and implementation of restoration and mitigation projects, and construction monitoring. She has assisted other professionals in stream surveys, fish salvage, stream diversion projects, wetland hydrology modeling, and Environmental Impact Statements (EIS). She has authored numerous technical reports and provided support and peer review on environmental assessments, feasibility studies, vegetation surveys, and documentation involving the Clean Water Act (CWA), Coastal Zone Management Act (CZMA), and the National Environmental Policy Act (NEPA). Ms. Miller has prepared permit applications and supporting documentation for the Federal Energy Regulatory Commission (FERC), Oregon Energy Facility Siting Council (EFSC), CWA Section 404, County Conditional Use Permits (CUP), Washington Joint Aquatic Resources (JARPA), Streambed Alteration under the California Environmental Quality Act (CEQA), and the Washington State Environmental Policy Act (SEPA) especially in support of dam removal, urban-wildland interface fire reduction, pipeline, liquefied natural gas (LNG), military facility development, transmission line, wind energy, and solar energy projects. Ms. Miller combines 12 years of professional consulting experience with 20 years of forestry science, commercial fishing, wilderness recreation management, environmental legal research, and Geographic Information Systems (GIS) technical work.

Education

Coursework, Environmental Professional Program (EPP), Portland State University, 2005
Coursework, Graduate Studies: Geography and Land Use Planning, Portland State University, 2000
BS (Bachelor of Science), Resource Management (Minor: Wildlife Management), Oregon State University, 1987
AAS (Associate of Applied Science), Natural Resource Technology, Vermilion College, 1981

Registrations/Certifications

Professional Wetland Scientist, Earned 1/1/07
Certified Erosion and Sediment Control Lead, Earned 1/1/10

Training

Episodic Streams-Imperatives for Assessment and Environmental Planning in California; UC Berkeley; 2010
Grasses, Sedges and Rushes of the Lower Puget Sound Region; Washington Coastal Training Program; 2012
Advanced Wetland Soils and Hydrology for Delineators; PSU EPP; 1999
Basic Water Rights; Portland State University (PSU) Environmental Professional Program (EPP); 2007
Best Approaches to NEPA Compliance in Oregon and ESA II; PSU EPP; 2005
Completing Biological Assessments and Habitat Conservation Plans under ESA; PSU EPP; 2005
Desert Survival Training; 2008
Episodic Streams Workshop; 2010
ESA I: The ESA Overview; PSU EPP; 2005
ESA Project Compliance; PSU EPP; 2003
First Aid/CPR; 2010

Hydrogeomorphic Method of Classifying Functions and Values; PSU EPP; 2001
Identifying Pacific Northwest Grasses, Sedges and Rushes; PSU EPP; 2002
Identifying Winter Twigs; PSU EPP; 2002
National Environmental Policy Act (NEPA); 2009
Oregon Rapid Wetland Assessment Protocol (ORWAP); 2010
Project Management Level 201 Training; Tetra Tech; 2007
Removal-Fill Permitting Workshop; 2011
Removal-Fill Permitting Workshop; 2011
Technical Writing for Professionals Workshop; 2010
Using the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual Arid West Region; USACE; 2007
Using the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual Western Mountains, Valleys, and Coast Region; USACE; 2008
Using the Revised Washington State Wetland Rating System; 2007
Wetland Delineation; PSU EPP; 1996
Wetland Mitigation Construction and Installation; PSU EPP; 2001
Wetland Mitigation Planning & Monitoring Workshop; 2011
Wetland Plants of the Pacific Northwest; PSU EPP; 1999
Wilderness First Responder; 2009 and 2012

Corporation Project Experience

Biologist, Biological Assessment Threatened and Endangered Plant Species Section, January –March 2012,

Portland General Electric, Cascade Crossing Transmission Line Project, Boardman to Salem, OR

Authored rare plant species section of the Biological Assessment (BA) for the 215 mile (plus alternative routes) transmission line project. Peer reviewed and edited the Survey and Manage vascular and non-vascular vegetation report for the BA. Documents were prepared as part of the Oregon Energy Facility Siting Council (EFSC) Site Certificate Application and National Environmental Policy Act (NEPA) documentation.

**Task Lead & Survey Coordinator, Wetland Delineations & Botanical Surveys, March 2010 – present
Portland General Electric, Cascade Crossing Transmission Line Project, Boardman to Salem, OR**

Coordinator for wetland and stream delineations, rare plant surveys, and noxious weed surveys for a 215 mile 500-kV transmission line and alternative routes. This has involved preparing a desktop study, hiring staff, preparing proposals for three sub-contractors, contract preparation, coordinating staff and sub-contractor field surveys, conducting field surveys, assessing impacts, and peer reviewing wetland/stream delineation and botanical survey reports. Draft reports of the results of the first season's surveys have been prepared in support of joint agency Removal-Fill permitting and the Oregon EFSC Site Certificate Application and NEPA documentation.

**Task Lead Wetlands, Rare Plants and Habitat Surveys, April 2010 – present
enXco, Wilkins Section 5 & 9 Project, Klickitat County, OR**

Field lead for wetland and stream, rare plant, and habitat field studies, GPS mapping, and report writing for a potential wind energy project in Klickitat County. The results of the studies were provided in a biological constraints map for the purpose of assisting in avoidance of sensitive resources during the project layout design phase. Biological reports supporting a county Environmental Impact Statement (EIS) being completed in compliance with the Washington State Environmental Policy Act (SEPA) process.

Biologist, Desert Waters Survey, March 2011- 2012**NextEra, McCoy Solar Energy Project, Riverside County, CA,**

Partnered with staff fluvial geologist in the field delineation, assessment and evaluation of waters and report and permit application preparation for a 750-megawatt photovoltaic solar energy project in the Sonoran Desert. Prepared proposal and cost estimate, walked transects across the project mapping and collecting data, prepared federal regulatory agency report and received U.S. Army Corps of Engineers concurrence. Currently finalizing state agency report for a California Streambed Alteration Agreement under the California Environmental Quality Act (CEQA).

Biologist, Wetlands, Waters & Botanical Surveys, 2010 – 2012**Gamesa & Diversified Winds, 2Morrow Wind Energy Project, Morrow County, OR**

Supported proposals and cost estimates for wetlands, waters and rare plant surveys. Provided desktop studies and reports for wetlands, waters, and habitat categories for a large wind energy project in Eastern Oregon in preparation for biological studies in support of county conditional use permits and an Oregon Energy Facility Siting Council (EFSC) application.

Biologist, Fish Habitat Restoration, Winter 2011**Umatilla Tribe, Meacham Creek Restoration Project, Umatilla County, OR**

Provided support and peer review of vegetation monitoring section of fish habitat restoration plan for a 20-mile section of restored Meacham Creek, a tributary of the Columbia River. The monitoring plan provides a template for the Umatilla Indian tribe to monitor other such restoration projects on tribal lands.

Permitting Support, May 2010 – 2011**National Science Foundation, Woods Hole Oceanographic Initiative, West Coast United States Arrays**

Supported installation of an oceanographic research project including the completion of environmental assessments and state and federal permit applications for various phases of the project. The project involves placing research instruments in strategic locations in the oceans of Northern Hemisphere. The current project phase involves submitting permit applications for test instruments off the coast of Oregon. The project is supported by the National Science Foundation and supports the collection of data on the chemical, biological, and physical properties of the ocean waters and sea floor. Project support I provided also included periodic attendance at public meetings, disseminating information, meeting stakeholders, and recording public comments on the project.

Task Lead, Biologist, April – June 2010**enXco, Miller Ranch Southwest and Miller Ranch Northeast, Klickitat County, WA**

Coordinated and led the wetlands, stream, rare plants, and habitat field surveys, mapping and reporting for two permit application addendums to the permitted Miller Ranch Wind Project. Field surveys involved surveying corridors across remote semi-arid canyon and rangeland. Provided a critical issues analysis and mapping of sensitive resources for the purpose of identifying sensitive areas for avoidance and wrote biological sections of the draft EIS and final EIS for these natural resources, assessed impacts, wrote erosion and sediment control language and habitat management plans for these project addendums, and peer reviewed outside consultants' reports.

Biology Lead, Wetlands, Rare Plant and Habitat Surveys, April 2009 – September 2010**enXco, School Section Wind Energy Project, Klickitat County, WA**

Field lead for wetland and stream, rare plant, and habitat field studies, GPS mapping, and report writing for a potential wind energy project in Klickitat County. The results of the studies were provided in a biological constraints map for the purpose of assisting in avoidance of sensitive resources during the project layout design phase. Wrote biological sections for draft and final EIS, peer reviewed additional

biological resource reports and submitted wetland and rare plant reports for submittal with permit applications.

Field Biology Lead, Habitat Categorization, August 2010

Portland General Electric, Cascade Crossing Transmission Line Project, Boardman to Salem, OR

Coordinated field habitat categorization survey for a 200-mile 500-kV transmission line in Oregon. This involved a team approach to developing and testing methods, mapping survey areas, setting up materials for field teams, support for each field team, and collecting survey results. Results of the habitat categorization and the wetland and stream delineation reports and functional assessments are being analyzed and reported for the Oregon Energy Facility Siting Council (EFSC) Site Certificate Application and NEPA documentation.

Biology Lead, Wetlands and Streams Delineation, September - May 2010

enXco Sand Ridge Wind Project, Klickitat County, WA

Conducted a reconnaissance survey of wetlands and other waters for a critical issues analysis of a potential wind project on 40,000 remote acres in Washington. Followed up by leading field delineations and mapping of these same waters. Results will be compiled into a report meeting agency reporting standards for use with a county EIS for permitting purposes.

Biology Research and Analysis, June – July 2010

China Mountain Wind LLC, China Mountain Wind Project, Idaho Falls County, ID

Provided research and analysis for several mitigation options for potential impacts to greater sage grouse habitat on a proposed wind energy project in southeastern Idaho. Reviewed literature and potential costs and assessed the feasibility of several sagebrush habitat restoration scenarios. Mitigation options evaluated included conservation easement agreements, grazing management, wetland and stream restoration, and burned area seeding and planting.

Biologist on Washington Ground Squirrel Survey, March – May 2010

Portland General Electric, Cascade Crossing Transmission Line Project, Boardman to the John Day River, OR

Part of a field team of wildlife biologists surveying for the presence of the Washington ground squirrel along portions of a proposed transmission line route within the semi-arid habitat of the species. Walked transects within the project corridor looking for and recording potential burrows, siting, or signs of the species.

Biologist, Critical Issues Analysis, June 2009-2010

Iberdrola Renewables, Western States sites

Provided analysis for the presence of wetlands, waters, soils, wildlife, rare plants, and other sensitive resources on sites across the western states being considered for potential solar project development. Likely presence of sensitive resources were provided in critical issues analyses for each project location so the locations could be compared against each other for feasibility of development.

Task Manager, Field Biologist, May 2009 – September, 2010

EnXco Miller Ranch and Linden Ranch Wind Projects, Klickitat County, WA

Conducted biological surveys for County Critical Areas Ordinance and County EIS documentation in support of the Energy Overlay Zone (EOZ) permitting of two wind energy projects. Worked with project manager and client personnel in support of micrositing to avoid wetlands and other sensitive areas and worked closely with GIS staff to produce soils, wetland, and stream figures for the wetland delineation reports.

Biologist, Wetlands and Streams, March – June, 2010

Cherokee Tribal Nations, Chilocco Wind Energy Project, Kay County, OK

Conducted a reconnaissance and follow-up field delineation of wetlands and other waters on a 10,000-acre site on tribal lands in north-central Oklahoma. Mapped the wetlands, rivers, and streams and worked with the tribe's project manager to relocate potential turbines in order to avoid these resources. Provided a report with mapping of the delineated features.

Task Lead, Biologist, Nov 2009 – September 2010

Coyote Crest Wind Power Project, Lewis and Grays Counties, WA

Led a field delineation of wetlands and other waters along a 15-mile transmission line proposed for pole replacements. Provided mapping and a wetland delineation report for agency submittal. Provided wetlands and soils sections for the county EIS. Made follow-up site visit to assess the forest habitat on three parcels.

Biology Lead, Wetlands and Streams, September – October 2009

Competitive Power Ventures, Cimarron Wind Energy Project, Gray County, KS

Led the field delineation of wetlands and streams on a 40,000 acre potential wind power project in central-west Kansas. GPS-mapped each feature and provided an extensive report for submittal to the Army Corps of Engineers and Kansas Department of Agriculture.

Task Lead, Field Biologist, March – December, 2009

Cogentrix Energy Solar Projects, Mojave Desert, CA and NV

Conducted waters surveys according to Army Corps of Engineers guidelines for the purpose of supporting the siting of three solar energy projects (thermal and photo voltaic) in the Mojave Desert. Provided the waters reports for support of an EIS and a California Streambed Alteration Agreement for the projects.

Deputy Project Manager and Biologist, August 2008 – July 2009

NextEra Inc., Stateline 3 Wind Project Oregon EFSC application, Umatilla County, OR and Walla Walla County, WA

Technical and field support for Oregon Energy Facility Siting Council site certificate amendment request and Walla Walla and Umatilla County, WA conditional use permits (CUPs). Worked with project manager, client, and client field staff in tasks and preparation of the amendment request including numerous environmental and permitting exhibits. Worked closely with GIS staff to produce soils, wetland, and stream figures. Led field delineation and met client engineers on-site to advise them on environmental constraints and sensitive area avoidance. EFSC amended certificate, Umatilla County CUP, and numerous associated permits were issued and project was constructed.

Associate Biologist, October 2008 – February 2009

FERC Jordan Cove Liquefied Natural Gas (LNG) and Pacific Connector Pipeline Project, Coos County, OR

Prepared botanical, fungi and anadromous fish species sections of a Biological Evaluation for NEPA documentation for a liquefied natural gas (LNG) pipeline project that would span southern Oregon and parts of northern California. This involved assessing and documenting potential impacts of the project components on sensitive plants, lichens, mosses, fungi, and fish species.

Wetlands Task Manager, June 2008 – February 2009

McChord Air Force Base, Pierce County, WA

Lead biologist on a wetland field study and GPS-mapping project. Wrote wetland delineation and wetland functions report per agency submittal standards for forty-six wetlands on the McChord Air Force Base. Included reviewing and critiquing a previous wetland delineation prepared by another firm.

The delineation and evaluation report will be used in avoiding impacts to wetlands during proposed base project development and construction.

Associate Biologist, Permit Application Support, January 2008 – March 2009

Goodnoe II Wind Energy Project, Klickitat County, WA

Prepared biological sections of a county EIS and supported biological evaluations of the potential wind project site for purposes of inserting into a SEPA checklist. The checklist was submitted with an Energy Overlay Zone permit application for the site.

Deputy Project Manager, Biologist, August 2008 – October 2008

NextEra Inc., Stateline 3 Wind Energy Project, Umatilla County, OR

Led field surveys of wetlands and streams and prepared wetland report for inclusion in Energy Facility Siting Council (EFSC) application for 100.5 megawatt wind energy project. Assisted project manager with writing of several application exhibits including wetlands, soils, water, waste, and required permits as well as peer reviewing the technical reports of other permit application exhibits.

Field Biologist, July 2008

Northwest Geothermal Company, Newberry Geothermal Project, Deschutes County, OR

Field crew member surveying for Northern Goshawk over a 7500-acre area of a geothermal development project. This involved walking through forest, periodically playing recorded goshawk calls, and looking and listening for presence of the species for the purpose of determining the species gender, nesting and breeding range within the project area.

Botany Field Crew, Rare Plant and Habitat Survey, May – June, 2008

Douglas County Public Utility District, Withrow Wind Project, Douglas County, WA

Surveyed Eastern Oregon shrub-steppe and grassland habitat documenting vegetative species for a proposed wind turbine project. Specifically looked for several sensitive vegetative species.

Biologist, February, 2008

FPL Energy, West Fry Wind Project, San Bernardino County, CA

Prepared a water crossing and habitat report for a 40-turbine wind project with approximately 12 miles of proposed transmission lines. The report was used in determining project feasibility and constraints.

Biologist, February – March, 2008

Alta Vista Sun Tower LLC

Authored the Soils and Agriculture and the Surface Water Resource sections of the biological survey report prepared for the California Energy Commission for the proposed Alta Vista Solar Generating Station.

Biologist, January 2008

Federal Energy Regulatory Commission (FERC), Yuma Lateral Natural Gas Pipeline Project, Yuma, AZ

Authored a Biological Assessment for a liquefied natural gas pipeline. The document addressed six species federally listed as threatened or endangered. It included an environmental baseline assessment and a discussion of the effect the project would have on the listed species. The pipeline was constructed in 2008.

Wetland Biologist, January 2008 – February 2008

Invenergy, Willow Creek Wind Energy Project, Gilliam & Morrow Counties, OR

Field delineated and provided GPS mapping and wetland delineation report for a 40-turbine wind energy project with an 8-mile transmission line and 5-mile fiber optic line in Morrow County, Oregon. The report was used in avoiding impacts to wetlands and streams during the planning and layout of the project.

Biologist, October 2007 – December 2007

BP Alternative Energy, Goshen North Wind Energy Project, Bonneville County, ID

Provided wetland and stream field study and GPS mapping and wrote report per agency submittal standards for a 39-turbine wind energy project in East Idaho. The report will be used in avoiding impacts to wetlands, streams and other waters.

Project Manager, May 2007 – September 2007

Northwest Wind Partners, Lower Linden Wind Energy Project, Klickitat County, WA

Prepared a State Environmental Policy Act (SEPA) Checklist for submittal with an Energy Overlay Zone (EOZ) permit application for a wind energy project in Klickitat County. Worked with regulatory agency personnel, project proponent and subcontractors in coordinating engineering, environmental, mapping, visual, and cultural components of the application submittal. Conducted field delineation of wetlands and streams and prepared report.

Wetlands Task Manager, Environmental Permitting Specialist, July 2007 – July 2008

Northwest Wind Partners, Miller Ranch and Lower Imrie Wind Energy Projects, Klickitat County, WA

Assisted project manager in coordinating environmental, visual and cultural studies for the purpose of completing a SEPA Checklist for submittal with EOZ permit applications for two large wind energy projects. Worked closely with civil engineer and environmental subcontractor in micro-siting facilities for sensitive resource avoidance. Conducted field delineations of wetlands and streams and prepared reports. Miller Ranch has been permitted but is undergoing project revisions. Lower Imrie project was cancelled in lieu of the Goodnoe II wind project permitted for the area north of the Lower Imrie project site.

Biologist, July – September 2007

BP Alternative Energy, Silver Star, Sherbino Mesa & Rolling Thunder Wind Projects

Provided field studies and reports for two wind energy projects in Central and West Texas for use in avoiding major impacts to wetlands, streams and other waters and thus avoiding the need for Clean Water Act individual Section 404 permits. The projects were constructed with minimal impacts to wetlands and waters and thus were covered under Nationwide Permits for minor impacts. Provided peer review and coordination of a subcontractor on Rolling Thunder wind project wetland and stream reconnaissance in South Dakota for use in refining the project facility layout. Layout was revised to become a smaller wind turbine project, Titan Phase I.

Biologist, August 2007

Verizon Wireless, Rocky Flat Cellular Repeater Station, Klickitat County, WA

Provided field survey and Biological Evaluation for project involving the installation of a cellular facility on an existing electrical transmission tower near the town of Lyle, Washington. Evaluation involved looking for habitat within the project vicinity that could support federal and state listed endangered or threatened species and providing an assessment that the project would avoid impacts to the listed species.

Biologist, January – April 2007

KEA Pillar Mountain Wind Energy Project, Kodiak, AK

Provided peer review and submitted final wetland and stream delineation report for a small wind project on Kodiak Island for which regulatory agency concurrence was obtained. Completed Clean Water Act (CWA) Section 404 permit application and obtained the permit on behalf of project proponent. Identification of jurisdictional waters for impact avoidance and minimization allowed for use of the expedient Nationwide Permit process.

Biologist, May – June 2007

Bureau of Indian Affairs, Indian Allotment 8 Development Project, Chelan County, WA

Wrote Biological Assessment as per Endangered Species Act requirements for a 75-lot housing project adjacent to Lake Chelan for a local Native American tribe. Documentation was prepared and submitted for agency review. Provided field delineation and report of wetlands and streams according to Federal and State regulatory agency guidelines.

Biologist, January – March 2007

Cascade Wind Project, Wasco County, OR

Provided peer review and submitted delineation report for a large proposed wind project near The Dalles, Oregon. Provided the wetland section and other biological information of a state Energy Facility Siting Council (EFSC) application.

Biologist, January 2007 – March 2007

Dayton Wind Project, Columbia County, WA

Responsible for identifying, delineating and GPS mapping of wetlands and streams and state and federal permit application preparation for impacts on a 70-turbine wind energy project. Prepared a Joint Aquatic Resources Permit Application (JARPA) for wetland and stream impacts and peer reviewed the State Environmental Policy Act (SEPA) checklist for the project.

Previous Experience

URS Corporation, 2003 to 2007

Wetlands

Team Leader/Senior Wetland Ecologist, 2005 – 2006

Northern Star Liquefied Natural Gas (LNG), Bradwood Landing, OR

Provided leadership and coordination on a Federal Energy Regulatory Council (FERC) application for a project spanning both Oregon and Washington on the Columbia River. The project included a 30-mile long pipeline and would involve river dredging and construction of an LNG facility, disposal area, transmission lines, parking lot, and road and culvert improvements. Coordinated staff and subcontractors in conducting wetland and stream delineations, functions assessments, and wetland ratings. Was part of team assessing fish, wildlife, vegetation, habitat, and wetlands, and planning the mitigation for impacts to these resources as part of state and federal permit applications including Section 404, Washington Joint Aquatic Resources Permit Application (JARPA), Coastal Zone Management, and the Oregon Joint-Removal-Fill permit Application as well as documentation for an Environmental Impact Statement (EIS).

Task Lead/Senior Wetland Ecologist, 2006

Georgia-Pacific Pipeline Project, Toledo, OR

Task lead in wetland and stream delineation, functions assessment and GPS mapping for a water pipeline improvement project. This involved delineating separate estuarine and freshwater resources, preparation of a Joint (state and federal) Removal-Fill permit application, an off-site mitigation plan, and fish isolation and salvage plan. Provided peer review of each deliverable.

Team Leader/Senior Wetland Ecologist, 2004 – 2005

Eugene Parkway, Eugene, OR

Conducted wetland and stream delineations, functions assessments, rare plant surveys, and mapping for lands adjacent to parkway alternative alignments in support of state and federal permit applications. These included a Joint Removal-Fill Permit application with extensive mitigation plans and Supplemental and Final Supplemental Environmental Impact Statements (FSEIS).

Project Manager/Wetland Ecologist, 2005

City of Lake Oswego, Inverurie Project, Lake Oswego, OR

Conducted a wetland and stream delineation challenging a previous delineation conducted on the site. Provided confirmation of wetlands previously assessed by the project proponent (City of Lake Oswego). Required coordination and onsite meeting with client and regulatory agency staff.

Task Lead/Wetland Ecologist, 2005

Camas-Washougal Boat Ramp Project, Port of Washougal, WA

Worked with team on the SEPA Checklist and environmental permit applications, including a Joint Aquatic Resources Permit Application (JARPA) for an eight-lane boat ramp project on the Columbia River; included a wetland and stream delineation of the site. Permit application planning involved meeting with City planners, project engineer, and project proponent, and providing an extensive project site alternatives analysis as required by the JARPA process.

Task Lead/Wetland Ecologist, 2005

Two-Lane Boat Ramp Project, City of Castle Rock, WA

Conducted wetland and stream delineation, wrote wetland report, and prepared SEPA Checklist and Joint Aquatic Resources Permit Application (JARPA) for a boat ramp project on the Cowlitz River. Worked closely with the project engineer to assess and avoid sensitive resource impacts.

Task Lead/Wetland Ecologist, 2004

Columbia County Department of Land Development Services, St. Helens, OR

Conducted a wetland and stream delineation, wrote mitigation plan, and supported wetland Joint Removal-Fill permitting on six-acre County solid waste and recycle transfer station project. Met permit application deadline on a short-notice project and negotiated on-site mitigation with regulatory agencies. Required meetings and close coordination with client and Army Corps and Department of State Lands (DSL) regulatory staff. Mitigation plan was implemented by the project proponent.

Wetland Ecologist, 2004

Oregon Economic & Community Development Division, Lebanon, OR

Delineated wetlands, performed wetland functions assessment, and wrote subsequent reports for the 120-acre Rodeo Industrial Site for purpose of assessing site for Industrial Certification under State economic development program.

Wetland Ecologist, 2004 – 2006

Portland Metropolitan Service District (Metro), Portland, OR

Conducted wetland and stream delineations and prepared wetland report updates on alternative designs for the MAX Light Rail South Corridor Project. Project required onsite meetings with client and regulatory agencies.

Team Leader/Wetland Ecologist, 2003

ODOT, Central Oregon Highway Bridges

Conducted wetland delineations and special status wildlife species habitat inventories and wrote subsequent reports for various bridge improvement projects in Central and Eastern Oregon. Studies were prepared in support of an expedited environmental permitting process to address bridges in urgent need of repair.

Team Leader/Wetland Ecologist, 2003

ODOT, SE 19th to SE 32nd Road Widening Project, Lincoln City, OR

Conducted wetland and stream delineation and wetland functions assessment and wrote reports for Highway 101 widening project in preparation of joint (state and federal) removal-fill permit application.

Wetland Ecologist, 2003

ODOT, Highway 26 Widening Project, Washington County, OR

Crafted wetland mitigation plan and stream relocation planting plan and prepared joint removal-fill permit application and Washington County Clean Water Services natural resource assessment for Highway 26 road widening project in city of Cedar Hills. Mitigation opportunities in the vicinity were few and creative solutions were required. Coordinated onsite meetings with client and Washington County Clean Water Services agency. Wetland mitigation has subsequently been installed by the project proponent and has met monitoring standards.

Task Manager/Wetland Ecologist, 2003

Northwest Natural Gas South Mist Pipeline Extension Project, Clackamas and Washington Counties, OR

Conducted wetland and stream field delineations, GPS site mapping, and technical memorandum preparation. Identified wetlands within proposed construction access areas for purpose of joint wetland removal-fill permit application and Washington County Clean Water Services natural resources assessment preparation. Conducted post-construction monitoring per state agency requirements.

Wetland Ecologist, 2003

British Petroleum (BP), Cherry Point Refinery Project, Blaine, WA

Conducted wetland and stream delineation and functions assessment and GPS-mapped a 50-acre expansion portion of a 200-acre refinery project site. Delineation was used in crafting the environmental permit application.

Wetland Ecologist, 2003

Northwest Pipe and Casing, Oregon Department of Environmental Quality/Environmental Protection Agency, Clackamas, OR

Prepared an on-site wetland mitigation report for a Superfund site soil remediation project. Mitigation project has been implemented, monitored and deemed a success by state and federal regulatory agencies.

Biological Surveys/ Ecological Assessments and Monitoring

Team Leader/Wetland Ecologist, 2005

Northwest Natural Gas, South Mist Pipeline Extension Project, Clackamas and Washington Counties, OR

Monitored wetland and stream crossing mitigation sites for compliance with joint (state and federal) removal-fill permit and Washington County Clean Water Services rules on constructed 60-mile natural gas pipeline.

Wetland Biologist, 2003

ODOT, Proposed West Eugene Parkway, Eugene, OR

Part of a plant inventory team conducting vegetation and sensitive species inventories on a 5-mile long corridor proposed for a roadway development project. Vegetation inventories were for use in preparation of an FSEIS.

Task Manager/ Ecologist, 2003 – 2004

South Mist Pipeline Extension Project, Northwest Natural, Clackamas, Marion and Washington Counties, OR

Conducted topsoil field analysis for a 60-mile long pipeline project corridor for soil conservation planning purposes. Managed field crew hand-excavating and analyzing over 400 soil pits. Pipeline was constructed in 2004 and soil conservation plan was implemented by project proponent.

National Environmental Policy Act (NEPA)

Biologist, 2005

FEMA, City of Portland Urban Fuels Reduction, Portland, OR

Prepared Environmental Assessment and NEPA documentation for a Federal Emergency Management Agency (FEMA) grant application for the Portland Wildland Urban Interface Fuels Reduction program. Assessed and documented potential impacts of the fuels reduction plan on three large urban open-space areas. Application was accepted by FEMA, grant was issued to City of Portland, and City has implemented fuels reduction activities.

Task Manager/Wetland Ecologist, 2004

Lolo Pass Bear Creek Culvert Replacement & Fish Passage Improvement Project, Clackamas County, OR

Conducted wetland and stream delineation and prepared a joint removal-fill permit application and NEPA Categorical Exclusion for a project replacing a culvert with a bridge. Project resulted in construction of a bridge that provided fish passage improvement for special status species.

GIS/GPS

Project Manager/Wetland Ecologist, 2004

Industrial Certification Application, City of Lebanon, OR

Conducted GPS survey of delineated wetlands on 120-acre Rodeo Industrial Site for project feasibility study.

GIS Technical Assistance, 2003

ODOT Proposed West Eugene Parkway, Eugene, OR

Rectified orthophotos and digitized wildlife habitat overlays for support of GIS mapping of proposed parkway project.

GIS Technical Assistance, 2003

Port of Vancouver Eagle Study, Vancouver, WA

Rectified orthophotos and mapped eagle nests and flight paths for support of GIS mapping of port properties.

Fish Netting and Fish Salvage

Field Biologist, 2006

Northern Star Liquefied Natural Gas (LNG), Bradwood Landing, OR

Shocked and netted fish for species survey of estuarine inlet for support of proposed LNG project environmental permit applications.

Field Biologist, 2004

Northwest Natural Gas, Washington County, OR

Netted, shocked and salvaged fish at multiple creek crossings during 60-mile Southmist Pipeline Project construction. Included certification to operate fish shocking equipment. Replaced fish in streams after pipeline installation.

Self-Employed Consultant, 2001 to 2003

Wetlands

Biologist, 2001– 2003

Oregon Coast, Willamette Valley, Mt. Hood, and the Portland-Vancouver Metropolitan Area

Performed a variety of wetland and stream delineations, wetland functions assessments and GPS surveys as an independent environmental consultant for support of a variety of development permit applications.

Biological Survey

Biologist, 2001

Metropolitan Service District (Metro), Portland, OR

Surveyed vegetation on a 60-acre burn research area on Cooper Mountain site in Washington County with senior botanist. Site has since been purchased as part of Metro's Greenspaces program.

Entranco Inc., 2000-2001

Wetland Consultant, Willamette Valley, the Portland-Vancouver Metropolitan Area, and Yakima County, WA

Performed a variety of wetland and stream delineations, wetland functions assessments and GPS surveys in Oregon and Yakima, Washington for a consulting firm formerly in Beaverton, Oregon. Prepared Section 404 and local permit applications and wetland mitigation plans.

Professional Affiliations

Member, Certified Professional Wetland Scientist (PWS) by Society of Wetland Scientists; 2007-present

Member, Society of Wetland Scientists, Member and Chapter Volunteer

Discipline Codes

Biologist, Primary

Ecologist

Environmental Scientist

Skill Set

Aerial Photogrammetry

Environmental Monitoring

Environmental Permitting

Field Biology

Field Sampling

Freshwater Wetland Assessment

Permitting

Resource Planning

Terrestrial and Wetland Ecological

Investigations

Vegetation Assessments

Wetland Function and Value Assessment (WET)

Hydrogeomorphology Function and Value Assessment (HGM)

Estuarine HGM Function and Value Assessment

Wetlands Delineation

Wetlands Ecology

Wetlands Mitigation

Professional References

Jeffrey Walker, Botanist, URS Corporation 206-438-2351, jeffrey_walker@URSCorp.com

Loverna Wilson, Senior Botanist & Wetland Scientist, 541-758-3403, loverna@peak.org

Nancy Rorick, Hydrogeologist, Rorick Environmental Services, 503-452-9312, nrorick@verizon.net

Related Company Information

Payroll Number: 521143

Employment Status: P-6



Preferred First Name: Laura

Office Location: Portland

Hire Date: 1/8/07

Years with Other Firms: 7

Years with Current Firm: 5

Total Years' Experience: 12

Supervisor: Laura R. Nagy, Natural Resources Discipline Lead

Office Phone: (503) 721-7218

Cell Phone: (503) 703-8396

Fax: (503) 227-1287

E-mail Address: laura.miller@tetratech.com

Other E-mail Address (if any):

Resume Last Revised: 6/20/12

EXPERIENCE SUMMARY

Ms. Leonard is a geological engineer with over eight years of experience as an Assistant Engineer in environmental and remediation engineering and commercial construction. Responsibilities have included: assisting project management and design and support engineering for various remediation projects; AutoCAD drafting; soil, sediment, and groundwater sampling; work plan and permit/compliance report preparation; on-site project management for commercial construction projects; design and support engineering for water and wastewater treatment and distribution systems; and oversight of installation and mechanical integrity testing of deep injection wells.

Ms. Leonard has experience in hazardous waste investigations and remedial actions on federal CERCLA and RCRA sites and State Model Toxic Control Act (MTCA) sites and has performed site characterization and investigation and field sampling for the USACE and the U.S. Navy. She has developed several sampling and analysis plans that include UFP QAPPs which have been approved by the Region 10 EPA, Washington State Department of Ecology, and the Oregon Department of Environmental Quality. Ms. Leonard has also been the lead investigator and/or field sampling lead for several large environmental projects including site investigations at: NAS Whidbey Island, WA; EPA NPL site in North Tacoma, Washington; former Naval Air Facility Adak, Alaska; and the Former Camp Adair, Oregon. She has also been responsible for the development of large summary closure reports that have lead to over five “No Further Action” responses from Ecology. See below for detailed project information.

EDUCATION

BS, Geological Engineering, 2004, Missouri University of Science and Technology

TRAINING

National UST Decommissioning (U2) Certification (from ICC) 2011
Washington State Site Assessment (U7) Certification (from ICC) 2011
Emergency Care Basic Life Support Training – 2011
OSHA HAZWOPER Refresher- 2011
40-Hour OSHA Hazardous Waste Health and Safety Training – 2009
30-Hour OSHA Training – 2009
Dale Carnegie Training Class for Effective Communication and Human Relations - 2008
10-Hour OSHA Training – 2006
PADI Scuba Certified - Open Water, Advanced Open Water, and Enriched Air Nitrox – 2005
MSHA Safety Training Program - 2002

CORPORATION PROJECT EXPERIENCE

Associate Remediation Engineer, September 2011 - Current
U.S. Navy, TCRA (Phase I) and NTCRA (Phase II) to Prevent Further Landfill Erosion (Seawall Repair) at Area 1 Beach Landfill, NAS Whidbey, WA

Supported the Project Manager with tasks associated with the Time Critical Removal Action (TCRA) to prevent further landfill erosion (Phase I) and the design and construction of permanent coastal erosion protection (Phase II) at Area 1 Beach Landfill, NAS Whidbey Island. Tasks included leading the preparation of the Work Plans for both Phases and assisting the project manager with scheduling, budget,



Monthly Progress Reports, procurement of material and equipment, and subcontracts.

Associate Remediation Engineer, April 2012 - Current
U.S. Navy, Wetland Delineation and Impact Study at Lake Hancock Target Range, NAS Whidbey, WA

Acted as the main author of the Work Plan and associated Environmental Protection Plan, Sampling and Analysis Plan, and Accident Prevention Plan for the Wetland Delineation and Impact Study at the former Lake Hancock Target Range, NAS Whidbey, WA. Assisted in project management tasks including budget tracking, status meetings with the Navy, and other associated tasks. Will act as the GIS technician during Wetland Delineation and Impact Study field activities.

Associate Remediation Engineer, November 2010 – Current
USACE Site Investigation at Multiple Sites at the Former Camp Adair, OR

Lead Investigator and Field Operations Lead (FOL) for technical development and implementation of a Site Investigation program to determine whether soil, sediment, surface water and/or groundwater contamination exist at Multiple Sites at the Former Camp Adair, Oregon. Acted as the main author of the Work Plan and led the Visual Site Inspection which acted as the Kick-off Meeting for the project. Assisted project management tasks including; Monthly Progress Report preparation, procurement of subcontractors, schedule updates, and budget tracking. Served as the FOL during SI activities in the field to determine specific sample locations and collected soil samples. Responsible for preparing the SI report which details the findings of SI activities.

Associate Remediation Engineer, May 2012 - Current
Lockheed Martin Space Systems Company, US Air Force Plant PDKS Bioremediation Project, Waterton, CO

Involved in field activities including groundwater monitoring (water level measurements, water quality samples, groundwater sampling) and field oversight during the installation of nine biobarriers using EEO and DHC injection treatment to reduce TCE and NDMA levels in alluvial groundwater.

Associate Remediation Engineer, September 2010 - Current
U.S. Navy, Land Use Controls and Institutional Controls Inspections at NAS Whidbey, WA

Supported the Project Manager with tasks associated with LUC inspections and shoreline monitoring. Tasks included Work Plan preparation, inspection report preparation, Monthly Progress reports, and schedule updates. Was the FOL during the LUC inspections and shoreline monitoring, conducting the inspections and directing the survey crew to determine the rate of erosion of the shoreline at the Area 1 Landfill.

Associate Remediation Engineer, June 2010 – June 2011
ARRA Ruston North Tacoma Yard Clean-up Project, Ruston and North Tacoma, WA

On site during the soil testing of over 230 residential yards to identify the extent, if any, of contamination and whether the yards required remediation. Was a part of a field team that collected soil samples at predetermined sample locations and in five depth intervals using a hand auger. After sample collection acted as Field Laboratory Manager of the on site laboratory working closely with the project chemist to set up the laboratory and efficiently managed the sampling program; over 600 samples from over 160 residential yards were cataloged, stored, sampled and analyzed. Responsible for the coordination and implementation of the rigorous field sampling preparation program that followed requirements set forth in



EPA SW 846 method 6200 and was in charge of sample analyzing using an INNOV-X Systems ALPHA series field portable X-Ray Fluorescence Spectrometer and responsible for the data management of field results. Also involved in the Post-Remediation sampling to verify contaminated soil was properly removed by the remediation contractor.

Associate Remediation Engineer, October 2009 – January 2012
Groundwater Monitoring/Sampling at McChord Air Force Base and Fort Lewis

Supports the Project Manager with groundwater sampling at McChord Air Force Base and Fort Lewis during quarterly sampling. Collects depth to water measurements and groundwater samples to be analyzed at an off site laboratory.

Associate Remediation Engineer, September 2009 - January 2011
U.S. Navy, Land Use Controls and Institutional Controls Repairs and Improvements at the Former Naval Air Facility, Adak, AK

Supported the Project Manager with scheduling and budget management during proposal preparation. Developed the Work Plan for the project including engineering design support of seawall repairs, land use control improvements and repairs, and erosion control repairs at CERCLA facilities to ensure long-term compliance with institutional controls. The repairs and improvements included large scale erosion repairs to landfill caps at 5 different landfills, construction and repairs to 4 miles of roads including new culvert installations and roadside swale installation, revegetation at 10 sites, and other repairs to site control including fencing and signage. Supported project management tasks during site construction activities and was the main author of the closure report that detailed the construction activities. Ensured the project was completed ahead of the specified schedule and under budget; received specific commendation from the Navy's Project Manager in the final evaluation for the task order.

Associate Remediation Engineer, June 2009 – March 2010
U.S. Navy, Pipeline Decommissioning and Excavation at the Former Naval Air Facility, Adak, AK
Assisted project management during construction activities for the decommissioning of over 47,000 linear feet of fuel pipelines at the Former NAF Adak. Including management of and distributing daily production reports, weekly QC meeting minutes, schedule updates, decommissioned pipeline activity tracking, soil and waste sampling data review, and Closure Report preparation. Developed up front planning documents including a rigorous Stormwater Pollution Prevention Plan and Spill Response plan. Successfully utilized an on-site water treatment system to treat on-site, 84,000 gallons of decontamination and excavation waters. Appropriately characterized and disposed of 7 tons of hazardous sludge and 41 tons of non-hazardous debris, including asbestos. Ensured this 5.8M project was completed within the specified schedule and under budget.

Associate Remediation Engineer, July 2009 – February 2010
U.S. Navy, Site Investigation at Five MRP Sites at the Naval Air Station, Whidbey Island, WA
Assisted project management tasks during site characterization activities at the Naval Air Station Whidbey Island including supporting the Data Quality Objective (DQO) process with preparation of meeting agenda and minutes, generation and approval of key field change requests, schedule updates, and SI Report preparation. Lead a field activities that included a very large soil, sediment, and water sampling program where several hundred multi-incremental samples were collected and prepared for chemical analysis. Both the plans and the field program were successfully implemented resulting in the Ecology and EPA awarding the Navy 5 No Further Action letters for chemical contaminants at these sites. The primary contaminants of concern included inorganics, perchlorate, and munitions related VOCs and SVOCs.



PREVIOUS EXPERIENCE

Assistant Project Manager, January 2006 – April 2009

S.M. Wilson & Co., St Louis, MO

Assisted project management activities for a General Contractor including subcontract preparation, schedule development, submittal and RFI tracking, submittal review, change management, MEP coordination, and project closeout on the following commercial construction projects; 9 Target Retail stores, Waterloo School District New High School, and the Jewish Community Center Caryln Wohl Building.

Assistant Engineer and Geologist, June 2004 – December 2005

LBFH, Inc. (currently AECOM), Palm City, FL

Assisted the project engineer on utility service projects including design and engineering support of water and wastewater distribution systems, evaluated water treatment technologies and prepared a preliminary design of the selected recommendation, and performed and reported on infiltration and inflow studies of storm and sanitary sewer systems. Also provided daily observation for the construction and mechanical integrity testing of several deep injection wells and collected and field tested water quality samples at monitors wells associated with the deep injection wells.

Research Assistant, June 2003 – August 2003

University of Missouri-Rolla Rock Mechanics

Assisted Dr. Paul Worsey on a U.S. Army Corps of Engineers project with evaluated the effect of shaped charges on reinforced concrete while an undergraduate student at the University of Missouri- Rolla.

Engineering Technician/Construction Site Inspector, June 2002 – August 2002

Kansas City Missouri Public Works- Engineering Division

As a part of a summer internship, worked as an engineering technician reviewing contract documents and observed daily construction activities for a variety of civil construction projects.

DISCIPLINE CODES

Geological Engineer
Assistant Project Manager

SKILL SET

Environmental Geology
Environmental Engineering
Project Management
Preliminary Assessment/Site Investigation
Erosion Control
Field Sampling
Sampling - Sediment
Sampling - Soil
Sampling - Water Level Measurements
Groundwater/Surface Water Sampling
Borings and Wells - Monitoring Well Installation
Hydrogeology - Pump Test Analysis
Hydrogeology - Water Quality



TECHNICAL EXPERTISE

Proficient in AutoCAD, Surfer 9, Microsoft Office (Word, Excel, Project, PowerPoint, Outlook), Leica GPS Unit applications, Trimble handheld GPS applications, and INNOV-X Systems ALPHA series field portable X-Ray Fluorescence Spectrometer applications.

LANGUAGE SKILLS

English *Knowledge Level:* Primary: Fluent

RELATED COMPANY INFORMATION

Payroll Number: 526367
Employment Status: Full
Preferred First Name: Barb
Office Location: Bothell, WA
Hire Date: June, 2009
Years with Other Firms: 5
Years with Current Firm: 3
Total Years Experience: 8
Supervisor: Brent Jones, Supervising Engineer
Office Phone: 303-980-3534
Cell Phone: 314-322-4582
E-mail Address: Barbara.leonard@tetrattech.com
Resume Last Revised: February 2012



Mark A. Ladd, U.S. Navy EOD/DV Ret.
2039 So. 69th E. Ave. ▪ Tulsa, Oklahoma 74112
mark.ladd@sbcglobal.net ▪ (918) 619-2608

EOD/UXO Senior Technician/Diver Corp #1947

U.S. Navy (Oct 1971-July 1995)

EOD Tech July 1987-July 1995 (96 Months active duty)

Senior instructor at the Naval Diving and Salvage Training Center in Panama City, Fl. teaching underwater demolition techniques and demo range instructor, Eglin AFB. Range safety supervisor at EOD Detachment Yorktown, Va. Assigned to the "Broken Arrow" task force and worked with the U.S. Secret Service on the "Presidential Protection Team".

Senior EOD Technician (Diver Qualified) Conduct visual and/or detector-aided UXO and discarded military munitions (DMM) field search activities. Locate subsurface UXO and DMM by operating geophysical detection instruments and related equipment. Perform field maintenance and calibration checks on geophysical detection instruments and related equipment. Remove non-hazardous munitions debris and range-related debris, only after such items have been inspected by a UXO technician or UXO qualified personnel and determined to be safe for handling. Perform site/area security functions. Reconnoiter and classify UXO and DMM. Identify all types of military munitions, including possible fuzes and their condition, armed or unarmed. Examples of these military munitions are:

Bombs

Guided missiles

Projectiles

Rockets

Land mines and associated components

Pyrotechnic items

Military explosives and demolition materials

Grenades

Sub-munitions

Excavate subsurface UXO and DMM. Move and/or consolidate UXO and DMM that has been determined acceptable for movement within a Munitions Response Site (MRS) OR Munitions Response Area (MRA), but not over public traffic routes. Transport demolition materials and/or UXO and DMM that have been determined safe for transport over public traffic routes, when required. Prepare firing systems, both electric and non-electric, for demilitarization operations. Operate personnel decontamination stations. Assist in the inspection of Material Potentially Presenting an Explosive Hazard (MPPEH) for the presence of explosive hazards. Construct UXO-related protective works. Properly store explosive materials per applicable guidance. Determine precise location in field environment using a variety of techniques such as use of global positioning equipment, or basic land navigation techniques using topographical map and compass. Perform field collection procedures to identify contaminated soil. Prepare an on-site holding area to temporarily stow MEC that has an acceptable risk of movement. Operate modes of transportation for transporting UXO, for which the risk of movement has been determined acceptable, when appropriate. Perform limited technical supervision of UXOSP. Escort personnel who are not directly involved in UXO-related operations (e.g., personnel performing environmental monitoring), but have activities to perform within exclusion areas. Inspect MPPEH for the presence of explosives safety hazards. Supervise and perform the on-site demilitarization of MEC and handling of demolition materials. Prepare an explosives storage plan per all applicable guidance. Prepare required UXO munitions response actions and/or range maintenance administrative reports. Prepare standard operating procedures for on-site munitions responses and/or for range clearance activities. Assist in the preparation of risk and hazards analyses. Conduct daily site safety briefings. Supervise the conduct of all on-site UXO-related operations. Inspect and certify and/or verify MPPEH as safe or as to the explosive hazard it may present for transfer within the Department of Defense or release from DOD control per current policies and standards.

Mark A. Ladd
UXO TECHNICIAN III/DIVER
TULSA, OKLAHOMA



EDUCATION: Nathan Hale High School, Graduated 1971

TRAINING: OSHA 1910.120 40-Hour HAZWOPER Training; Aug 1995
OSHA 1910.120 30-Hour Construction Safety; Jul 2008
OSHA 1910.120 8-Hour Annual Refresher Training; Nov 2010
American Safety Training Institute CPR/AED; Nov 2010
American Safety Training Institute First Aid; Nov 2010
American Safety Training Institute Emergency Oxygen Administration
American Safety Training Institute Blood-borne Pathogens & OPIM
Explosive Ordnance Disposal Course; Jul 1986
U.S. Navy Second Class Diver Course; Sep 1984
MK 16 Closed Circuit Diver Course; Jun 1986
Advanced Nuclear Weapons Course; Jul 1988

EXPERIENCE SUMMARY:

14 total years of Explosive Ordnance Disposal/Unexploded Ordnance (EOD/UXO) experience.
26 total years of Diving experience.
Current Passport
Secret Clearance
Current Dive Physical
NAUI Dive Master

PROJECT EXPERIENCE:

UXO Tech III; Tetra Tech Inc.; Feb 5, 2012 to Present.

Quantico Va. Detector aided search of grids. Brush clearing for GEO team.

EOD Tech (Advisor); DynCorp International; 12 Sep 2011 to 17 Dec 2011.

Advance team tasked with finding and disabling MANPADS in Libya. Details provided upon request.

UXO Tech III (Safety/QC); Tetra Tech Inc.; Aug 2011 to Aug 2011.

UXO sweep of dry river beds in known ordnance areas of Beaumont, California.

UXO Tech III; Tetra Tech Inc.; June 2011 to June 2011.

UXO "Escort" for the collection of water samples in a known ordnance area at the Ammunitions Plant in Burlington, Iowa.

UXO Tech III (Safety/QC); Tetra Tech Inc.; June 2011 to June 2011.

UXO "Avoidance Operation" for drill/sampling team at Indian Head, MD.

UXO Tech III (Safety/QC); Tetra Tech Inc.; May 2011 to June 2011.

UXO "Remedial Investigation" (RI) which included an "NOSSA Audit" at Cecil Field, Florida.

EOD Tech (Advisor); DynCorp International; Mar 2011 to May 2011.

Advisor to the Tanzania Army leading a team to clean up damaged ordnance due to an explosion involving multiple weapons storage buildings. 13,843 items (37.16 net tons) of fused ordnance was collected and destroyed. Over 14,000 damaged (not fused) ordnance items (over 203 tons) collected. 349.4 tons of ordnance related items was collected and removed.

UXO Tech III (SUXOS); Tetra Tech Inc.; Nov 2010 to Dec 2010.

UXO construction support, Aberdeen Proving Grounds (APG), Maryland.

UXO Tech III (Safety/QC); Tetra Tech Inc.; Nov 2010 to Nov 2010.

UXO Escort for fire brake cutting team Corpus Christi, Texas.

UXO Tech III; Tetra Tech Inc.; Nov 2010 to Nov 2010.

Mag and flag transects Lakehurst, New Jersey.

UXO Tech III; Tetra Tech Inc.; Sep 2010 to Oct 2010.

UXO Escort for drill team, tidal side, Concord, California.

UXO Tech III (SUXOS); Tetra Tech Inc.; Sep 2010 to Oct 2010.

Trenching and demolition operations, inland side, included an "NOSSA Audit" at Concord California.

UXO Tech III; Tetra Tech Inc.; Jul 2010 to Aug 2010.

UXO escort for drill team and geo teams, Vandenberg AFB, California.

UXO Tech III (Safety/QC); Tetra Tech Inc.; Jul 2010 to Jul 2010.

UXO construction support, Indian Head Training Center, Indian Head, Maryland

UXO Tech III (Safety/QC); Tetra Tech Inc.; Jun 2010 to Jul 2010.

UXO escort for GEO team, Quantico Marine Base, Quantico, Virginia

Field UXO Senior Supervisor (SUXOS); Tetra Tech Inc.; Jun 2010 to Jun 2010.

UXO construction support, Aberdeen Proving Grounds (APG), Maryland.

Field UXO Senior Supervisor (SUXOS); Tetra Tech Inc.; Mar 2010 to Apr 2010.

UXO escort for GEO team at Roosevelt Roads Naval Base, Puerto Rico

UXO Tech III (Safety/QC); Tetra Tech Inc.; Feb 2010 to Mar 2010.

UXO mag and flag at Pensacola Naval Air Station, Pensacola, Florida

UXO Tech III; Tetra Tech Inc.; Feb 2010 to Feb 2010.

UXO support for digging operations at the Burlington Army Ammunitions Plant, Burlington, Iowa

UXO Tech III; Tetra Tech Inc.; Jan 2010 to Feb 2010.

UXO support for archeological team at Roosevelt Roads Naval Base, Puerto Rico

UXO Tech III (Safety/QC); Tetra Tech Inc.; Jan 2010 to Jan 2010.

UXO support establishing transects followed by detector aided search and GPS work at Paris Island Marine Training facility, Paris Island, South Carolina

UXO Tech III (Safety/QC); Tetra Tech Inc.; Nov 2009 to Dec 2009.

UXO support for GEO team and mag/flag at Seal Beach Navy Base, Seal Beach California

UXO Tech III (Safety/QC); Tetra Tech Inc.; Oct 2009 to Nov 2009.

UXO construction support in the tidal area, Naval Weapons Station, Concord, California

EOD Tech (Advisor); DynCorp International; Sep 2009 to Oct 2009.

Recon/Map ordnance items and collect information from local tribes in the Torakena region of Nu Gina

UXO Tech III; Tetra Tech Inc.; Jul 2009 to Aug 2009.

UXO support for earth removal operations at Burlington Army Ammunitions Plant, Burlington, Iowa

UXO Tech III; Tetra Tech Inc.; Jun 2009 to Jul 2009

UXO construction support at the Naval Weapons Station, Concord, California

UXO Tech III; Tetra Tech Inc.; May 2009 to Jun 2009

UXO support for earth removal operations at Burlington Army Ammunitions Plant, Burlington, Iowa

UXO Tech III (SUXOS); Tetra Tech Inc.; Apr 2009 to May 2009

UXO support establishing transects, mag/flag grids and establishing GPS coordinates at Quantico Marine Base, Quantico, Virginia

UXO Tech III; Tetra Tech Inc.; Apr 2009 to Apr 2009

UXO escort for core sampling team on land and off shore at Mare Island Sub Base, Mare Island, California

UXO Tech III (Diver); Environmental Chemical Corp. (ECC); Apr 2009 – Apr 2009

Diving operations to clear ordnance from pier support construction site 60' depth at the Ammunitions pier Concord Weapons Station, Concord, California **UXO Tech III; Tetra Tech Inc.; Mar 2009 to Apr 2009**

UXO construction support at the Naval Weapons Station, Concord, California

UXO Tech III; Tetra Tech Inc.; Feb 2009 to Mar 2009

UXO construction support and GEO escort at Naval Weapons Station, Fallbrook, California

UXO (Diver); STRATA; Sep 2008 to Oct 2008

Superlite 17 surface supplied air dive to 100' in the Great Slave Lake, Canada

UXO Tech III; Pika; Jul 2008 to Aug 2008

UXO mag and flag transects at the Picatinny Army Base, Picatinny, New Jersey

Diver; Oklahoma Aquarium; May 2008 to Present

Volunteer work target medicating and feeding marine life and performing the feeding show to the public, Jenks, Oklahoma

Operations Manager; Fox Collision Center; Feb 2007 to Oct 2007

17 locations in 4 states. Rebuilt infrastructure to support growth nationally. Created the "Circle of Dependability" identifying key requirements for insurance company endorsement. Tulsa, Oklahoma

Branch Manager; N Glantz and Son Inc.; Jul 2005 to Feb 2007

National wholesale distributor of sign supplies with 21 locations. As a "turn around" leader, I achieved significant operational and warehouse readiness through the development of personnel metrics, building a winning team through effective asset utilization techniques and the development of a safety training program. We set the standard for customer service. Provided leadership in various project's contributing to facility improvements, Safety, budgetary improvements and team building programs ensuring a profitable annual business plan. Tulsa, Oklahoma

Plant Operations Manager; Pepsi-Cola; May 1997 to Jul 2004

As the team leader of multiple sites including Tulsa, Muskogee, and Tahlequah, Oklahoma, along with Coffeerville, Kansas and Joplin, Missouri my primary responsibilities included production, facility safety, maintenance and improvements, personnel staffing and training, fleet, and warehouse operations. Provided leadership in the development of numerous operational and safety programs that became a standard worldwide for Pepsi facilities. Strong P & L responsibilities with heavy emphasis on inventory control. Tulsa, Oklahoma

Production Manager; Anheuser Busch Brewery; Aug 1995 to May 1997

As a front line production manager I was responsible for manufacturing line performance, safety training, quality of product and leadership for union employees. This position required strong budget and inventory knowledge. Williamsburg, Virginia

U.S. Navy; Oct 1971 to Jul 1995

Started out as a Yeoman until 1982 at which time I joined BUD'S class 143 in Coronado, CA. Left for the Navy diving school in April 1984. Went to EOD School at Indian Head in October 1986. I retired from the Navy July 1995. My assignment and mission details available on request.

PRESENTATIONS:

Ladd, M. A., "Sexual Harassment Policies" presented at U.S. Navy Diving Salvage and Training Center, Panama City, Florida, June 1986.

Ladd, M. A., "Communications" presented for the American Heart Association at St. Francis Hospital, Tulsa, Ok., Oct 1996.

PUBLICATIONS/ARTICLES:

Ladd, M. A., "U.S. Navy Diving Manual" (Life Saving Techniques), Aug 1986.

NOTABLE DISTINCTIONS

"Research Associate" and "Divisional Leader" for the U.S. Navy's Deep Sea Diving and Salvage Training Center in Panama City, Florida. Assisted in the development of training programs and authored segments of the U.S. Naval Diving Manual. Presented new Harassment program to thousands of personnel.

"Safety Manager" for underwater and surface explosive operations with no lost time accidents for the 6 years I held the position.

Member of the military "Presidential Protection Team" assigned to the United States Secret Service.

Created safety and procedural policy for Pepsi Cola Warehouse, Tulsa, Oklahoma **operation's resulting** in the top nationwide performance scores for 4 years running.

Developed operational standards for Pepsi Cola's Joplin Mo. region and overhauled P & L for maximum ROI for national wholesale distributor.

Board of Directors, Oklahoma Sign Association

Board of Directors, Navy Federal Credit Union, Panama City, Florida



Accident Prevention Plan
Contract N62470-08-D-1008
Task Order JP01
NAS Whidbey Island, WA

Final
August 8, 2012

ATTACHMENT 3
CERTIFICATIONS



Tetra Tech, Inc.

Corporate Quality Assurance Program 2012 Annual Training

I, Mark A. Ladd (print legibly), have reviewed the Tetra Tech annual training materials on Corporate Quality Assurance Program on the Tetra Tech intranet site. I have read, understand and will follow the guidelines presented in this training session.

Signature: 

Date: 3 Feb 2012

Office: TT NUS



TETRA TECH

Training Documentation

Tetra Tech NUS Corporate Quality Assurance Program Manual

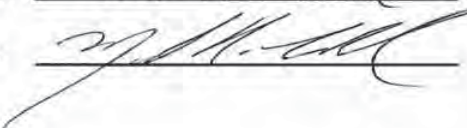
It is the policy of TtNUS that we perform our jobs and deliver our services and products in conformance to clearly established requirements. The Corporate Quality Assurance Program Manual (QAPM) implements this policy and details the responsibilities of each TtNUS employee.

The QAPM is located on the intranet site under the Quality Assurance folder at: <http://intranet.ttnus.com/Quality Assurance/Forms/AllItems.aspx>

The signature acknowledges that I have read the Corporate QAPM and understand and will perform my responsibilities as described in the QAPM. I have had an opportunity to have any questions I have answered and explained to my satisfaction.

Office/Location: IT NUS Stone Mountain GA.

Print Name: Mark A. Ladd

Signature: 

Date: 13 March 11



Tetra Tech NUS, Inc.

CERTIFICATE OF TRAINING

THIS CERTIFIES THAT

Mark Ladd

has successfully completed an 8-hour course of instruction in

OSHA 29 CFR 1910.120

GENERAL SITE WORKER REFRESHER TRAINING

Prepared and instructed by Tetra Tech NUS, Inc.

January 16, 2012

Date of Award

Certificate Number: **01-16-12-01**

Eric M. Samuels
Health and Safety Manager
Atlanta, Georgia

Certificate of Completion

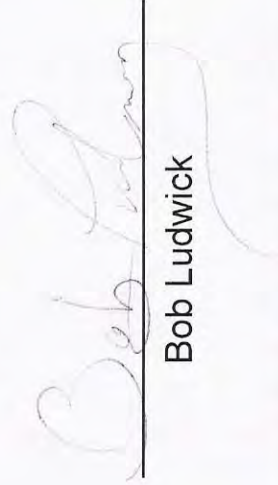


Northeast Florida Safety Council, Inc.

Mark A. Ladd

Has successfully completed the course of instruction for

40 Hour HAZWOPER Course


Bob Ludwick

18 August 1995



Mark Ladd

This card certifies that the above individual has successfully completed the requirements and skills examination in accordance with the American Safety Training Institute curriculum in:

Basic First Aid

Adult First Aid

Pediatric First Aid

11/28/2010

ISSUE DATE

11/28/2012

RENEWAL DATE

AMERICAN SAFETY TRAINING INSTITUTE

Naval School Explosive Ordnance Disposal



This certifies that

Boatswain's Mate Second Class
Mark A. Ladd, USN

having successfully completed
the prescribed course of study for

NAVY BASIC EXPLOSIVE ORDNANCE DISPOSAL

is awarded this
Certificate

this 1st day of July A.D. 1987

M. A. Murray
M. A. MURRAY, CDR, USN
COMMANDING OFFICER

CPR & AED CERTIFICATION



Mark LADD

This card certifies that the above individual has successfully completed the requirements and skills examination in accordance with the American Safety Training Institute curriculum in:

Adult CPR AED

Child CPR AED

Infant CPR AED

11/28/2010

11/28/2012

ISSUE DATE

RENEWAL DATE

AMERICAN SAFETY TRAINING INSTITUTE

Certificate Of Completion

PRESENTED TO

Mark Ladd

In Recognition of Successful Completion of Requirements In
**CPR/AED (Adult/Child/Infant)
Universal First Aid**

11/24/2010

CERTIFICATION DATE

11/24/2012

EXPIRATION DATE

[Signature]

Christy Ann Beyer

AUTHORIZED SIGNATURE



www.AmericanSTI.org

This certifies participant listed above has successfully passed skills evaluation in accordance with national cognitive skills examination standards, and American Safety Training Institute certification terms and conditions. American Safety Training Institute courses follow national guidelines set by the American Heart Association (AHA), and the International Liaison Committee on Resuscitation (ILCOR). The American Safety Training Institute is not associated, affiliated with, sponsored, or endorsed by American Safety and Health Institute (ASHI), American Heart Association (AHA), or American Red Cross (ARC), and unless otherwise specified no affiliation or endorsement is implied.



Certificate of Completion

Mark A. Ladd

**Has Successfully Completed the
Course of Instruction in:**

OSHA 30 Hour Construction Industry Safety

Betty Reaties

Betty Reaties

OSC, Oklahoma Safety Council,
4323 NW 63rd St, Suite 140,
Oklahoma City, OK. 73116

July 21, 2008

Date completed

ATTACHMENT 4

FIELD HEALTH AND SAFETY FORMS

- Event/Near Miss Report and Investigation
- Incident Report Forms
- Daily Tailgate Safety Meeting Forms
- Quality Event Report and Investigation
- Event/Near Miss Report and Investigation Sketch Template and Instructions
- Daily Equipment Inspection
- Daily Briefing Sign-In Sheet
- EHS Weekly/Monthly Inspection and Action Item Report
- NAVFAC NW Mishap Heads-Up Initial Notification form

EVENT/NEAR MISS REPORT AND INVESTIGATION

Section 1, General Information			
Short Description/Title Below: (limited to 125 characters). This is the description that will appear in the database listing.			
Type of Event/Near Miss (check all that apply):			
Was a person injured or made ill: <input type="checkbox"/> By something at work <input type="checkbox"/> By something outside the work environment <input type="checkbox"/> No injury or illness			
Did this event occur in one of our major offices? <input type="checkbox"/> Yes <input type="checkbox"/> No List Office:			
Did this event occur in a foreign country? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Did this event involve:			
A strain?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Fire?	<input type="checkbox"/> Yes <input type="checkbox"/> No
A motor vehicle accident?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Property damage (>\$500)?	<input type="checkbox"/> Yes <input type="checkbox"/> No
A repetitive motion injury?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Spill/release?	<input type="checkbox"/> Yes <input type="checkbox"/> No
A fall?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Permit exceedance?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Being struck by something?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Event Information			
Case #:	Site Case #:	Workers Comp #:	
Where did the event occur?		Project # (4 digits):	
Site/Location Name:		Delivery Order #'s:	
Date of event:		Military time:	
Tetra Tech Supervisor on duty:		Was Supervisor at event scene? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Event Location:			
What employee/employer category was involved in this event?			
<input type="checkbox"/> Tetra Tech permanent <input type="checkbox"/> Tetra Tech craft/temp service <input type="checkbox"/> Subcontractor <input type="checkbox"/> Other			
Employer of affected employee?			
Weather conditions:		Adequate Lighting at Scene? <input type="checkbox"/> Yes <input type="checkbox"/> No	
What was the employee doing, or what was happening, just before the event occurred? Describe the activity below, as well as the tools, equipment, or material the employee was using. Be specific. For example, "climbing a ladder while carrying roofing materials," "spraying chlorine from hand sprayer," or "daily computer key-entry."			

EVENT/NEAR MISS REPORT AND INVESTIGATION

<p>What happened? What was the contact or event and how did it occur? Tell us below how the injury occurred. For example, "When the ladder slipped on the wet floor, the worker fell 20 feet," "worker was sprayed with chlorine when gasket broke during replacement," or worker developed soreness in wrist over time." Attach file if necessary.</p>		
Section 2, Affected Employee Information		
<p>Include injured person, driver/operator, or employee whose activities resulted in the event. A new event report must be created for each injured employee.</p>		
Employee's name:		Sex <input type="checkbox"/> Male <input type="checkbox"/> Female
Date of Hire:	Job classification:	Number of months at Tetra Tech:
Work hours on shift prior to event:	Years in job classification (##):	
Did event relate to routine task for job classification? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Section 3, Injury/Illness Information (If not applicable, check here <input type="checkbox"/> and go to Section 4)		
<p>Nature of injury of illness: Describe body part affected and how it was affected below. Be more specific than "hurt," "pain," or "sore." For example, "strained back."</p>		
<p>What object or substance directly harmed the employee? For example, "concrete floor," "chlorine," "radial arm saw." If this question does not apply to the event, leave it blank.</p>		
Was First Aid provided? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Did the injury/illness result in <input type="checkbox"/> Days away (with or without restricted days) <input type="checkbox"/> Restricted days only <input type="checkbox"/> No or unknown		
Did employee die? <input type="checkbox"/> Yes <input type="checkbox"/> No		
<p>Medical treatment does not include examination, diagnostic tests, or First Aid. See ZIP Bulletin 109 for OSHA definition of First Aid. Attach treatment report/doctor's note or send copies to Director, EHS Services.</p>		
Was medical treatment provided? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Section 4, Vehicle and Property Damage Information (If not applicable, check here <input type="checkbox"/> and go to Section 5)		
Damaged vehicle make:		Damaged vehicle model:
Damaged vehicle VIN:		Vehicle owner:
Property damaged:		
Describe property damage:		

EVENT/NEAR MISS REPORT AND INVESTIGATION

Section 5, Environmental Release (If not applicable, check here <input type="checkbox"/> and go to Section 6)		
<i>Environmental Release</i>		
Substance spilled or released:		
From where:	To where:	
Estimated quantity/duration:	CERCLA Hazardous substance? <input type="checkbox"/> Yes <input type="checkbox"/> No	
RQ exceeded? <input type="checkbox"/> Yes <input type="checkbox"/> No	Specify RQ:	
Reportable to agency? <input type="checkbox"/> Yes <input type="checkbox"/> No	Specify (place telecom in project file):	
Responsibility to report: <input type="checkbox"/> Tt <input type="checkbox"/> Client <input type="checkbox"/> Other	Time frame:	
Written report (place report in project file): <input type="checkbox"/> Yes <input type="checkbox"/> No		
Response action taken:		
<i>Permit Exceedance</i>		
Type of permit:	Permit #:	
Date of exceedance:	Parameter(s):	
Criteria:	Exceedance levels:	
Exceedance duration:	Reportable to agency: <input type="checkbox"/> Yes <input type="checkbox"/> No	
Specify (place telecom in project file):	Written report: <input type="checkbox"/> Yes <input type="checkbox"/> No	
Time frame:		
Response action taken:		
Section 6, Notifications		
Insert names of Tetra Tech personnel notified below:		
Name:	Date:	Time:
Name:	Date:	Time:
Name:	Date:	Time:
Name:	Date:	Time:
Client rep notified:	Date:	Time:
By whom:		
Agency notified:	Date:	Time:
By whom:		
Agency Contact Name:		
Section 7, Persons Preparing Report		
Signature of this form verifies that all supplied information is accurate.		
Employee's name (print):	Sign:	
Employee's name (print):	Sign:	
Supervisor's name (print):	Sign:	
Supervisor's phone number:		
Date:		
<i>Note to supervisor:</i> Supervisor is to forward a copy of the Event Report to immediate supervisor, PESM, ESS or ESC, and other personnel as identified in Table 1 of this procedure ASAP, but no later than 24 hours.		

EVENT/NEAR MISS REPORT AND INVESTIGATION

Section 8, Attach Sketches or Photos		
<i>Report Number:</i>		
Send sketch by mail, fax, or attach an electronic file.		
<i>Vehicle Events</i>		
Write in the street names and, if possible, the points of the compass. Attach black-and-white hard-copy photos or JPG or BMP files (JPG file sizes are typically smaller) as appropriate. If the sketch appears on a police report or insurance form, this need not be completed. Attach the other report or send a hard copy to the Director, EHS Services.		
Section 9, Investigative Report		
Date Information:		
Date of event:	Date of investigative report:	
<i>Event Cost:</i>		
Other event costs: \$	WC claim value: \$	Estimated loss: \$
Cause Analysis		
Was the activity addressed in an AHA? <input type="checkbox"/> Yes (attach applicable section) <input type="checkbox"/> No		
Immediate Causes		
What actions and conditions contributed to this event? Check all that apply:		
Substandard Acts		
<input type="checkbox"/> Operating equipment without authority	<input type="checkbox"/> Horseplay	
<input type="checkbox"/> Failure to warn	<input type="checkbox"/> Using equipment improperly	
<input type="checkbox"/> Failure to secure	<input type="checkbox"/> Failure to follow procedure	
<input type="checkbox"/> Operating at improper speed	<input type="checkbox"/> Personnel not properly qualified	
<input type="checkbox"/> Making safety devices inoperable	<input type="checkbox"/> Failure to communicate	
<input type="checkbox"/> Removing safety devices	<input type="checkbox"/> Operating equipment outside of specified parameters	
<input type="checkbox"/> Using defective equipment	<input type="checkbox"/> Failure to check equipment prior to acceptance	
<input type="checkbox"/> Failure to use PPE properly	<input type="checkbox"/> Acceptance of defective equipment	
<input type="checkbox"/> Improper loading	<input type="checkbox"/> Failure to provide proper equipment	
<input type="checkbox"/> Improper placement	<input type="checkbox"/> Improper servicing/maintenance of equipment	
<input type="checkbox"/> Improper lifting	<input type="checkbox"/> Other substandard acts	
<input type="checkbox"/> Improper position for task	<input type="checkbox"/> Servicing equipment in operation	
<input type="checkbox"/> Under influence of alcohol/drugs		
Substandard Conditions		
<input type="checkbox"/> Guards or barriers	<input type="checkbox"/> Exposure to hazardous materials	
<input type="checkbox"/> Protective equipment	<input type="checkbox"/> Extreme temperature exposure	
<input type="checkbox"/> Tools/equipment or materials	<input type="checkbox"/> Illumination	
<input type="checkbox"/> Congestion	<input type="checkbox"/> Ventilation	
<input type="checkbox"/> Warning system	<input type="checkbox"/> Visibility	
<input type="checkbox"/> Fire and explosion hazards	<input type="checkbox"/> Radiation	
<input type="checkbox"/> Poor housekeeping	<input type="checkbox"/> Hazardous environmental conditions	
<input type="checkbox"/> Noise exposure	<input type="checkbox"/> Other substandard conditions	

EVENT/NEAR MISS REPORT AND INVESTIGATION

Enter brief explanation of each <i>immediate cause</i> below:

Basic Causes

What specific personal or job factors contributed to this event? Check all that apply:

Personal Factors	Job Factors
<input type="checkbox"/> Inadequate physical/physiological capability	<input type="checkbox"/> Inadequate leadership and/or supervision
<input type="checkbox"/> Inadequate mental/psychological capability	<input type="checkbox"/> Inadequate engineering
<input type="checkbox"/> Physical or physiological stress	<input type="checkbox"/> Inadequate purchasing
<input type="checkbox"/> Lack of knowledge	<input type="checkbox"/> Inadequate maintenance
<input type="checkbox"/> Lack of skill	<input type="checkbox"/> Inadequate tools and equipment
<input type="checkbox"/> Improper motivation	<input type="checkbox"/> Inadequate work standards
<input type="checkbox"/> Other personal factors	<input type="checkbox"/> Excessive wear and tear
	<input type="checkbox"/> Abuse and misuse
	<input type="checkbox"/> Change
	<input type="checkbox"/> Other job factors

Enter brief explanation of each *basic cause* below:

--

Section 10, Action Plan

What has or should be done to control each of the causes listed? Consider the following Management Programs in developing remedial actions:

<input type="checkbox"/> Leadership and administration	<input type="checkbox"/> Health control
<input type="checkbox"/> Training	<input type="checkbox"/> System evaluation
<input type="checkbox"/> Planned inspections	<input type="checkbox"/> Engineering controls and change management
<input type="checkbox"/> Task analysis and procedures	<input type="checkbox"/> Personal communications
<input type="checkbox"/> Task observation	<input type="checkbox"/> Group meetings
<input type="checkbox"/> Emergency preparedness	<input type="checkbox"/> General promotion
<input type="checkbox"/> Rules and work permits	<input type="checkbox"/> Hiring and placement
<input type="checkbox"/> Accident/event analysis and corrective and preventive action	<input type="checkbox"/> Materials and services management
<input type="checkbox"/> Personal protective equipment	

EVENT/NEAR MISS REPORT AND INVESTIGATION

Remedial Actions			
Actions	Person Responsible	Target Date	Completion Date
1.	1.		
2.	2.		
3.	3.		
4.	4.		
Section 11, Persons Performing Investigation			
Investigator's name:		Date:	
Investigator's name:		Date:	
Investigator's name:		Date:	
Management Review			
<i>Note: Signature verifies that all supplied information is accurate; the description supports the causal analysis; and the Action Plan is sufficient to address the causes.</i>			
Project/Office Manager Approval: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Comments:			
Sign:		Date of Approval:	
ESQ (PESM) Approval: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Comments:			
Sign:		Date of Approval:	
Note: Attach additional information as necessary. Supervisor to forward copy of Investigative Report to the PM or Office Manager or ESQ as soon as possible, but no later than 72 hours after the event. A copy shall be sent to the Director, EHS Services, within 24 hours of completion of the report. Attach here.			



**TETRA TECH, INC.
 INCIDENT REPORT**

Report Date	Report Prepared By	Incident Report Number
INSTRUCTIONS:		
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	
INFORMATION ABOUT THE INCIDENT		
Description of Incident		
<hr/> <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	Client:	
Tt Supervisor or Project Manager	Was supervisor on the scene?	
	Yes <input type="checkbox"/> No <input type="checkbox"/>	
WITNESS INFORMATION (attach additional sheets if necessary)		
Name	Company	
Street Address	City, State and Zip Code	
Telephone Number(s)		



**TETRA TECH, INC.
 INCIDENT REPORT**

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

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



**TETRA TECH, INC.
 INCIDENT FORM IR-A**

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.		



**TETRA TECH, INC.
 INCIDENT FORM IR-A**

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"			
<div style="border-bottom: 1px solid black; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black;"></div>			
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"			
<div style="border-bottom: 1px solid black; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black;"></div>			
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".			
<div style="border-bottom: 1px solid black; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black;"></div>			
MEDICAL CARE PROVIDED			
Was first aid provided at the site: Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, describe the type of first aid administered and by whom?			
<div style="border-bottom: 1px solid black; margin-bottom: 5px;"></div>			
Was treatment provided away from the site: Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, provide the information below.			
Name of physician or health care professional		Facility Name	
<div style="border-bottom: 1px solid black; margin-bottom: 5px;"></div>		<div style="border-bottom: 1px solid black; margin-bottom: 5px;"></div>	
Street Address, City State and Zip Code		Type of Care?	
<div style="border-bottom: 1px solid black; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black;"></div>		Was individual treated in emergency room? Yes <input type="checkbox"/> No <input type="checkbox"/>	
<div style="border-bottom: 1px solid black; margin-bottom: 5px;"></div>		Was individual hospitalized overnight as an in-patient? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Telephone Number		Did the individual die? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, date: _____	
<div style="border-bottom: 1px solid black; margin-bottom: 5px;"></div>		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
<div style="border-bottom: 1px solid black; margin-bottom: 5px;"></div>	<div style="border-bottom: 1px solid black; margin-bottom: 5px;"></div>	<div style="border-bottom: 1px solid black; margin-bottom: 5px;"></div>	<div style="border-bottom: 1px solid black; margin-bottom: 5px;"></div>

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.



**TETRA TECH, INC.
 INCIDENT FORM IR-B**

<u>INSTRUCTIONS:</u>			
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			
Results of Incident: Fully describe damages, losses, etc.			
<div style="border-bottom: 1px solid black; height: 15px; width: 100%;"></div> <div style="border-bottom: 1px solid black; height: 15px; width: 100%;"></div> <div style="border-bottom: 1px solid black; height: 15px; width: 100%;"></div>			
Response Actions Taken:			
<div style="border-bottom: 1px solid black; height: 15px; width: 100%;"></div> <div style="border-bottom: 1px solid black; height: 15px; width: 100%;"></div> <div style="border-bottom: 1px solid black; height: 15px; width: 100%;"></div>			
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)	
		<div style="border-bottom: 1px solid black; width: 100%;"></div> Exceeded? Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	
FIRES / EXPLOSIONS (Provide information related to fires/explosions)			
Fire fighting equipment used? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, type of equipment: <div style="border-bottom: 1px solid black; width: 100%;"></div>			
NOTIFICATIONS			
Required notifications	Name of person notified	By whom	Date / Time
Client: <div style="border-bottom: 1px solid black; width: 100%;"></div> Yes <input type="checkbox"/> No <input type="checkbox"/>			
Agency: <div style="border-bottom: 1px solid black; width: 100%;"></div> Yes <input type="checkbox"/> No <input type="checkbox"/>			
Other: <div style="border-bottom: 1px solid black; width: 100%;"></div> 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: <div style="border-bottom: 1px solid black; width: 100%;"></div>			
Was an additional written report on this incident generated? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, place in project file.			



**TETRA TECH, INC.
 INCIDENT FORM IR-C**

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	



**TETRA TECH, INC.
 INCIDENT FORM IR-C**

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"/>
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"/>
Citation #				Citation #		
Citation Description				Citation Description		
PASSENGERS IN VEHICLES (NON-INJURED)						
<p>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</p>						
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-TETRA TECH 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"/>			Yes <input type="checkbox"/>	No <input type="checkbox"/>	Yes <input type="checkbox"/>
	Female <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"/>			Yes <input type="checkbox"/>	No <input type="checkbox"/>	Yes <input type="checkbox"/>
	Female <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		



**TETRA TECH, INC.
INCIDENT FORM IR-C**

COMPLETE AND SUBMIT DIAGRAM DEPICTING WHAT HAPPENED

A large, empty rectangular box with a thin black border, intended for the user to draw a diagram of the incident. The box is currently blank.

	TETRA TECH, INC. DAILY SAFETY MEETING FORM	Revision Date: 10/1/2008
		Document Control Number:
		FORM HST-2
		Page 1 of 2

Project: _____ Project Number: _____ PM/SSC: _____

Date/Time: _____ Project No.: _____

Client: _____ Site Location: _____

Site Activities Planned for Today: _____

Safety Topics Discussed
Protective clothing and equipment:
Chemical hazards:
Physical hazards:
Environmental and biohazards:
Equipment hazards:
Decontamination procedures:
Other:
Review of emergency procedures:

	TETRA TECH, INC. DAILY SAFETY MEETING FORM	Revision Date: 10/1/2008
		Document Control Number:
		FORM HST-2
		Page 2 of 2

Employee Questions or Comments:
--

Attendees	
Printed Name	Signature

Meeting Conducted by:

Name

Title

Signature

Quality Event Report and Investigation

Section 1, Event Description and Investigation			
Date of event:			
Office/Project Location:		Organization or Department:	
Means of identification:			
<input type="checkbox"/> Client concern	<input type="checkbox"/> Nonconformance report	<input type="checkbox"/> Audit report	<input type="checkbox"/> Corrective action request
<input type="checkbox"/> Supervisory review	<input type="checkbox"/> Peer review	<input type="checkbox"/> Project review	<input type="checkbox"/> Other (describe):
Enter Short Description/Title (limited to 125 characters) below. This is the description that will appear in the database listing.			
Issue Summary: Summarize the concern, problem, or situation that needs to be addressed. Identify who was involved and their role (e.g., performer, inspector, auditor).			
Section 2, Persons Preparing Report			
Signature of this form verifies that all supplied information is accurate.			
Employee's name (print):		Sign:	
Employee's name (print):		Sign:	
Supervisor's name (print):		Sign:	
Supervisor's phone number:			
Date:			
<i>Note to supervisor:</i> Supervisor is to forward a copy of the Event Report to immediate supervisor, PESM, ESS or ESC, and other personnel as identified in Table 1 of this procedure ASAP, but no later than 24 hours.			
Section 3, Investigative Report			
Date of investigative report:			
Other event costs: \$		WC claim value: \$	Estimated loss: \$
Cause Analysis			
<i>Immediate Causes</i>			
What actions and conditions contributed to this event? Check all that apply:			
Substandard Acts			
<input type="checkbox"/> Operating equipment without authority		<input type="checkbox"/> Inadequate inspection/peer review	
<input type="checkbox"/> Failure to follow/improper execution of procedure		<input type="checkbox"/> Poor judgment	
<input type="checkbox"/> Using equipment improperly		<input type="checkbox"/> Failure to communicate—written and/or verbal	
<input type="checkbox"/> Improper servicing/maintenance of equipment		<input type="checkbox"/> Acceptance of defective equipment/material	
<input type="checkbox"/> Under influence of alcohol/drugs		<input type="checkbox"/> Other substandard acts	
<input type="checkbox"/> Horseplay			

QUALITY EVENT REPORT AND INVESTIGATION

Substandard Conditions	
<input type="checkbox"/> Personnel not properly qualified or trained	<input type="checkbox"/> Inadequate oversight
<input type="checkbox"/> Defective equipment/material	<input type="checkbox"/> Inadequate procedure/instruction
Enter brief explanation of each <i>immediate cause</i> below:	
Basic Causes	
What specific personal or job management system factors contributed to this event? Check all that apply:	
Personal Factors	Job Factors
<input type="checkbox"/> Inadequate physical/physiological capability	<input type="checkbox"/> Inadequate leadership and/or supervision
<input type="checkbox"/> Inadequate mental/psychological capability	<input type="checkbox"/> Inadequate engineering
<input type="checkbox"/> Physical or physiological stress	<input type="checkbox"/> Inadequate purchasing
<input type="checkbox"/> Lack of knowledge	<input type="checkbox"/> Inadequate maintenance
<input type="checkbox"/> Lack of skill	<input type="checkbox"/> Inadequate tools and equipment
<input type="checkbox"/> Improper motivation	<input type="checkbox"/> Inadequate work standards
<input type="checkbox"/> Other personal factors	<input type="checkbox"/> Excessive wear and tear
	<input type="checkbox"/> Abuse and misuse
	<input type="checkbox"/> Change
	<input type="checkbox"/> Other job factors
Enter brief explanation of each <i>basic cause</i> below:	
Section 4, Action Plan	
What has or should be done to control each of the causes listed? Consider the following Management Programs in developing remedial actions:	
<input type="checkbox"/> Leadership and administration	<input type="checkbox"/> Engineering controls and change management
<input type="checkbox"/> Training	<input type="checkbox"/> Personal communications
<input type="checkbox"/> Planned inspections	<input type="checkbox"/> Group meetings
<input type="checkbox"/> Critical task analysis and procedures	<input type="checkbox"/> General promotion of Loss Control principles
<input type="checkbox"/> Task observation	<input type="checkbox"/> Hiring and placement
<input type="checkbox"/> Rules and work permits	<input type="checkbox"/> Materials and services management
<input type="checkbox"/> Accident/event analysis and corrective and preventive action	<input type="checkbox"/> Quality control
<input type="checkbox"/> System evaluation	

QUALITY EVENT REPORT AND INVESTIGATION

<i>Remedial Actions</i>			
Actions	Person Responsible	Target Date	Completion Date
1.	1.		
2.	2.		
3.	3.		
4.	4.		
Section 5, Persons Performing Investigation			
Investigator's name:		Date:	
Investigator's name:		Date:	
Investigator's name:		Date:	
Management Review			
<i>Note: Signature verifies that all supplied information is accurate; the description supports the causal analysis; and the Action Plan is sufficient to address the causes.</i>			
Project/Office Manager Approval: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Comments:			
Sign:		Date of Approval:	
ESQ (PESM, QA) Approval: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Comments:			
Sign:		Date of Approval:	
Note: Attach additional information as necessary. Supervisor to forward copy of Investigative Report to the PM or Office Manager or ESQ as soon as possible, but no later than 72 hours after the event. A copy shall be sent to the Director, EHS Services, within 24 hours of completion of the report. Attach here.			

DAILY EQUIPMENT INSPECTION

PROJECT _____
 MANUFACTURER TYPE _____
 UNIT # _____ MODEL _____ DATE _____
 ENGINE HRS/MILEAGE _____ / _____ SHIFT _____

Check appropriate column and describe correction needed.

	If Good (✓)	NA	Correction Needed
Steering Mechanisms^{1*}	_____	_____	_____
Service Brakes²	_____	_____	_____
Emergency Brakes¹	_____	_____	_____
Parking Brake¹	_____	_____	_____
Transmission & Controls	_____	_____	_____
Suspension & Springs	_____	_____	_____
Hydraulic Leaks	_____	_____	_____
Exhaust System	_____	_____	_____
Warning Gauges	_____	_____	_____
Windshield¹ & Wipers	_____	_____	_____
Lights (Head & Tail)	_____	_____	_____
Brake Lights¹	_____	_____	_____
Mirrors	_____	_____	_____
Seat and Seat Belts¹ (w/ ROPS)	_____	_____	_____
Tires/Tread¹	_____	_____	_____
Regular Horn	_____	_____	_____
Audible Back-up Alarm¹	_____	_____	_____
Steps, Hand-holds	_____	_____	_____
Fire Extinguisher	_____	_____	_____
Engine Coolant	_____	_____	_____
Engine Oil	_____	_____	_____
Hydraulics & Operating Controls	_____	_____	_____
Fenders/Mudflaps	_____	_____	_____
Heater/defroster	_____	_____	_____

Remarks:

¹ Items required to be operational by OSHA 1926.602 before use.

² Service brake must be capable of stopping and holding equipment fully loaded. _____

 Operator Name (Printed) _____
 Operator Signature
 Review : Superintendent _____
 Date Repairs or adjustments completed: _____
 Equipment Supervisor/Mechanic: _____

ESQ MEETING/DAILY BRIEFING SIGN-IN SHEET

Date: _____ Office/Project Name/Location: _____

Shift/Department: _____ Person Conducting Meeting/Briefing: _____

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

2. OTHER ISSUES (ESQ Plan changes, action items, attendee comments, etc.):

3. ATTENDEES (Print Name):

1.	21.
2.	22.
3.	23.
4.	24.
5.	25.
6.	26.
7.	27.
8.	28.
9.	29.
10.	30.
11.	31.
12.	32.
13.	33.
14.	34.
15.	35.
16.	36.
17.	37.
18.	38.
19.	39.
20.	40.

Give completed documentation to ESO.

EHS WEEKLY/MONTHLY CHECKLIST AND ACTION ITEM REPORT

Inspection Type: Weekly Monthly

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

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

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

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

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

Waste/Stockpiles		
47. Refer to: a. Attachment C – Hazardous Waste Less Than 90 Days For Hazardous Waste Stockpiles; b. Attachment C – Solid Waste For State Regulated/Non-Hazardous Stockpiles; and/or c. Attachment C – PCB for PCB Stockpiles, if applicable		
TSCA PCB Wastes		
48. Inspected every 30 days at a minimum. Refer to PESH PCB Checklist		
Point Source Discharges		
49. Permit conditions are being met.		
50. Monitoring equipment is fully operational.		
51. Equipment calibrations and maintenance is up-to-date.		
52. Discharge sampling performed at required intervals.		
53. Review monitoring results (<i>Report permit exceedances</i>)		
54. DMR and Plant Logs properly completed, signed, and submitted (if required).		
55. Fugitive Dust – Appropriate BMPs are instituted for fugitive dust emissions.		
Stormwater and other NPDES Discharge Activities		
56. SWPPP reflects current activities and has been updated as necessary.		
57. BMPs in SWPPP/Soil Plan implemented.		
58. Visual observations indicate stormwater meets water quality criteria.		
59. Stormwater BMP inspections conducted and documented as required (weekly and before/after > 0.5" storm event).		

60. Monitoring/sampling performed at required intervals.		
61. Review monitoring results if required. (<i>Report permit exceedances</i>)		


Project/Location:	Inspector/s:		Time/Date:
ACTION ITEM	RESPONSIBLE PARTY	SCHEDULE	DATE COMPLETED

Other Conditions or Work Practices			
62.			
63.			
64.			
65.			
66.			
67.			
68.			
69.			
70.			
71.			
72.			
73.			
74.			
75.			

Reviewed by: _____
 SS / Site Manager

_____ Date

cc: *Project Manager (monthly only)*
PESM (monthly only)

		NW MISHAP HEADS UP INITIAL NOTIFICATION	
<input type="checkbox"/> CIVILIAN <input type="checkbox"/> MILITARY <input type="checkbox"/> CONTRACTOR			
1. NAME OF ACTIVITY, INSTALLATION, OR LOCATION WHERE INCIDENT OCCURRED:		2. DATE AND TIME OF INCIDENT:	
3. TYPE OF WORK BEING PERFORMED:			
4. CORRECTIVE ACTION AT INITIAL NOTIFICATION AND WHEN FOLLOW UP WILL BE PROVIDED:			
5. EXTENT OF PROPERTY DAMAGE:			
6. SAFETY INVESTIGATORS:		7. EMPLOYEE IMMEDIATE SUPERVISOR OR RESPONSIBLE PERSON:	
		8. MISHAP REVIEW BOARD (MRB) ANTICIPATED DATE:	
9. BRIEF DESCRIPTION OF MISHAP (WHO, WHAT, WHERE, WHEN, WHY, AND HOW):			
THE INITIAL LESSONS LEARNED INCLUDE:			

Accident Prevention Plan
Contract N62470-08-D-1008
Task Order JP01
NAS Whidbey Island, WA

Final
August 8, 2012

ATTACHMENT 5
GENERAL SAFE WORK PRACTICES FOR FIELD WORK

	TETRA TECH, INC. GENERAL SAFE WORK PRACTICES FOR FIELD WORK	Revision Date: 10/1/2008
		Document Control Number:
		SWP 5-1
		Page 1 of 3

To prevent injuries and adverse health effects, the following general safe work practices (SWP) are to be followed when conducting work involving known and unknown site hazards. These SWPs establish a pattern of general precautions and measures for reducing risks associated with field operations not conducted on hazardous waste sites. This list is not inclusive and may be amended as necessary.

- Be familiar with and knowledgeable of and adhere to all instructions in the construction health and safety plan (C-HASP), job safety analysis, job hazard analysis, work permit or other health and safety documentation.
- At a minimum, a safety meeting will be held at the start of each project to discuss the hazards of the site and site work. Additional meetings will be held, as necessary, to address new or continuing safety and health concerns.
- Be aware of the location of the nearest telephone and all emergency telephone numbers.
- Attend a briefing on the anticipated hazards, equipment requirements, SWPs, emergency procedures, and communication methods before going on site.
- Plan and delineate entrance, exit, and emergency escape routes.
- Rehearse unfamiliar operations prior to implementation.
- Use the “buddy system” whenever respiratory protection, fall protection, or other protective equipment is in use. Buddies should establish hand signals or other means of emergency communication in case radios break down or are unavailable.
- In order to assist each other in the event of an emergency, buddies should maintain visual contact with each other and with other on-site team members by remaining in close proximity.
- Do not bring nonessential vehicles and equipment onto the site.
- Immediately report all injuries, illnesses, and unsafe conditions, practices, and equipment to the site safety coordinator (SSC).
- Maintain a portion of the site field logbook as a project safety log. The project safety log will be used to record the names, entry and exit dates, and times on site of all Tetra Tech personnel, subcontractor personnel, and project site visitors; and other information related to safety matters.



TETRA TECH, INC.
**GENERAL SAFE WORK PRACTICES FOR FIELD
WORK**

Revision Date: 10/1/2008

Document Control Number:

SWP 5-1

Page 2 of 3


- A portable eyewash station should be located in the support zone if corrosive materials are used or stored on the site.
- Smoking is not allowed on Tetra Tech projects sites, except in designated smoking areas.
- Do not bring matches and lighters in the exclusion zone or contamination reduction zone.
- Observe coworkers for signs of toxic exposure and heat or cold stress.
- Inform coworkers of nonvisual effects of illness if you experience them, such as headaches, dizziness, nausea, or blurred vision.
- Anyone known to be under the influence of drugs or intoxicating substances that impair the employee's ability to safely perform assigned duties shall not be allowed on the job while in that condition.
- Horseplay, scuffling, and other acts that tend to have an adverse influence on the safety or well-being of the employees is prohibited.
- Work shall be well planned to prevent injuries in the handling of materials and when working with equipment.
- No one shall knowingly be permitted or required to work while the employee's ability or alertness is so impaired by fatigue, illness, or other causes that might unnecessarily expose the employee or others to injury.
- Use proper lifting techniques. Heavy objects will be lifted using the large muscles of the leg instead of the smaller muscles of the back.
- Wear appropriate footwear and all other protective equipment required for work.
- Cleanse thoroughly after handling hazardous substances.
- Maintain all tools and equipment in good condition.
- First aid kits shall be located in a prominent location and stocked with basic first aid supplies.

	TETRA TECH, INC. GENERAL SAFE WORK PRACTICES FOR FIELD WORK	Revision Date: 10/1/2008
		Document Control Number:
		SWP 5-1
		Page 3 of 3

Disclaimer: This safe work practice (SWP) is the property of Tetra Tech, Inc. (Tetra Tech). Any reuse of the SWP without Tetra Tech's permission is at the sole risk of the user. The user will hold harmless Tetra Tech for any damages that result from unauthorized reuse of this SWP. Authorized users are responsible for obtaining proper training and qualification from their employer before performing operations described in this SWP.

Revision Date	Document Authorizer	Revision Details
10/1/2008	Chris McClain	NEW

The online version of this document supersedes all other versions. Paper copies of this document are uncontrolled. The controlled version of this document can be found on the Tetra Tech Intranet.

	TETRA TECH, INC. SAFE WORK PRACTICES for WORKING OVER OR NEAR WATER	Revision Date: 10/1/2008
		Document Control Number:
		SWP 5-6
		Page 1 of 3

The following sections discuss general procedures for working over or near water, underwater work, and cold water procedures.

1.0 SCOPE

This safe work practice (SWP) provides guidelines for all Tetra Tech employees and subcontractors who work over or near bodies of water three (3) or more feet deep or swiftly moving water. This SWP was developed in accordance with the Occupational Safety and Health Administration (OSHA) standard specified in Title 29 of the *Code of Federal Regulations* (CFR), Part 1926.106, “Working Over or Near Water.”

2.0 RESPONSIBILITIES

The project manager (PM) is responsible for identifying all health and safety requirements of each project, including all tasks that may involve worker exposure to hazards or working in or near bodies of water. The PM will appoint a site safety coordinator (SSC) to ensure that this SWP is followed in the field. Workers will follow this SWP whenever working near or in any body of water that is over three (3) feet deep or swiftly moving.

3.0 GENERAL PROCEDURES

When working over or near water, the following precautions will be taken:

- All staff and team members must wear a personal flotation device (PFD) when working within 15 feet of a water body. Personnel will be provided with U.S. Coast Guard (USCG)-approved life jackets or work vests. The PFD should be Class III, which will support the head of an unconscious person above water.
- Life jackets and work vests will be inspected before and after each use.
- Ring buoys with at least 90 feet of line shall be provided and readily available for employee rescue operations.
- The distance between ring buoys shall not exceed 200 feet.



TETRA TECH, INC.
SAFE WORK PRACTICES
for
WORKING OVER OR NEAR WATER

Revision Date: 10/1/2008

Document Control Number:

SWP 5-6

Page 2 of 3

- A USCG-approved life-saving skiff will be available.
- Under no circumstances will team members enter water bodies without protective clothing such as rubber boots or waders.
- At least one person will remain on shore as a look-out.

If a team member falls into the water, a ring buoy, branch, paddle, pole, or other floating object should be extended to the person in the water. Resist the impulse to dive in; employees should not attempt a deep water rescue unless they have been trained in water lifesaving skills.

When the person in the water grabs the extended item, the worker should be pulled toward the shore or boat. If the person is unconscious, the PFD, clothing, or hair should be hooked to pull the person toward the shore or boat. Once the person has been safely retrieved, necessary emergency medical procedures should be performed by qualified personnel. If none are necessary, the retrieved team member should change into dry clothing as soon as possible after any necessary personal decontamination.

4.0 UNDERWATER WORK

Underwater work should be performed in accordance with the procedures and guidelines of the Diving Safety Program (Document Control No. 2-15).

5.0 COLD WATER PROCEDURES

When the water temperature is below 45 °F, hypothermia is a serious risk. A person can lose feeling in the extremities within 5 minutes. Additional protective equipment such as cold water immersion suits may be required. All field staff members should be familiar with cold water survival techniques or should receive training from an American Red Cross-certified swimming instructor in cold water survival techniques when site conditions warrant such knowledge. Cold water safe work practices must be addressed in site specific safety documents.

After a person has been rescued from cold water, he or she should change into dry clothes as soon as possible. If the person who has fallen into the water displays hypothermia symptoms, he or she should be treated immediately and taken to a medical facility. Under no circumstances should the hypothermia victim be given hot liquids because this could



TETRA TECH, INC.
SAFE WORK PRACTICES
for
WORKING OVER OR NEAR WATER

Revision Date: 10/1/2008

Document Control Number:

SWP 5-6

Page 3 of 3

accelerate shock. Drinks no warmer than normal body temperature are acceptable. If symptoms are severe and evacuation to a medical facility cannot be quickly conducted, any wet clothing should be removed, the victim should be placed in blankets or sleeping bags in a sheltered location, and the rescuer should climb into the blankets or sleeping bag with victim to provide additional warmth. The victim should also be treated continuously for shock, elevating feet and monitoring the victim's pulse and breathing rate.

If a team member falls into cold water, he or she should not remove any clothing while in the water because clothing provides additional insulation. Although clothing creates an added drag while swimming, the insulation outweighs the disadvantage of the additional drag. Each team member should carry a wool hat to place on his or her head in case he or she falls into the water. A wool hat, even when wet, provides good insulation for the head, where a large amount of body heat is lost.

Disclaimer: This safe work practice (SWP) is the property of Tetra Tech, Inc. (Tetra Tech). Any reuse of the SWP without Tetra Tech's permission is at the sole risk of the user. The user will hold harmless Tetra Tech for any damages that result from unauthorized reuse of this SWP. Authorized users are responsible for obtaining proper training and qualification from their employer before performing operations described in this SWP.

Revision Date	Document Authorizer	Revision Details
10/1/2008	Chris McClain	Update from 1998 format



**TETRA TECH, INC.
FIELD AUDIT CHECKLIST**

Revision Date: 5/28/09

Document Control Number:

AF-1

Page 1 of 3

Project Name: _____ Project No.: _____

Field Location: _____ Completed by: _____

Project Manager: _____ Site Safety Coordinator: _____

General Items		In Compliance?		
		Yes	No	NA
Health and Safety Plan Requirements				
1	Approved health and safety plan (HASP) on site or available			
2	Names of on-site personnel recorded in field logbook or daily log			
3	HASP compliance agreement form signed by all on-site personnel			
4	Material Safety Data Sheets on site or available			
5	Designated site safety coordinator present			
6	Daily tailgate safety meetings conducted and documented			
7	On-site personnel meet HASP requirements for medical examinations, fit testing, and training (including subcontractors)			
8	Compliance with specified safe work practices			
9	Documentation of training, medical examinations, and fit tests available from employer			
10	Exclusion, decontamination, and support zones delineated and enforced			
11	Windsock or ribbons in place to indicate wind direction			
12	Illness and injury prevention program reports completed (California only)			
Emergency Planning				
13	Emergency telephone numbers posted			
14	Emergency route to hospital posted			
15	Local emergency providers notified of site activities			

The online version of this document supersedes all other versions. Paper copies of this document are uncontrolled. The controlled version of this document can be found on the Tetra Tech Intranet.



**TETRA TECH, INC.
FIELD AUDIT CHECKLIST**

Revision Date: 5/28/09

Document Control Number:

AF-1

Page 2 of 3

16	Adequate safety equipment inventory available			
17	First aid provider and supplies available			
18	Eyewash stations in place			
Air Monitoring				
19	Monitoring equipment specified in HASP available and in working order			
20	Monitoring equipment calibrated and calibration records available			
21	Personnel know how to operate monitoring equipment and equipment manuals available on site			
23	Environmental and personnel monitoring performed as specified in HASP			

Safety Items		In Compliance?		
		Yes	No	NA
Personal Protection				
1	Splash suit			
2	Chemical protective clothing			
3	Safety glasses or goggles			
4	Gloves			
5	Overboots			
6	Hard hat			
7	Dust mask			
8	Hearing protection			
9	Respirator			
Instrumentation				
10	Combustible gas meter			
11	Oxygen meter			

The online version of this document supersedes all other versions. Paper copies of this document are uncontrolled. The controlled version of this document can be found on the Tetra Tech Intranet.



**TETRA TECH, INC.
FIELD AUDIT CHECKLIST**

Revision Date: 5/28/09

Document Control Number:

AF-1

Page 3 of 3

12	Organic vapor analyzer			
Supplies				
13	Decontamination equipment and supplies			
14	Fire extinguishers			
15	Spill cleanup supplies			
Corrective Action Taken During Audit:				
Corrective Action Still Needed:				

Note: NA = Not applicable

Auditor's Signature

Site Safety Coordinator's Signature

Date

Accident Prevention Plan
Contract N62470-08-D-1008
Task Order JP01
NAS Whidbey Island, WA

Final
August 8, 2012

ATTACHMENT 6
ACTIVITY HAZARD ANALYSIS

Activity Hazard Analysis (AHA) #1

Job/Task: Mobilization/Demobilization	Overall Risk Assessment Code (RAC) (Use highest code)	M				
Project Location: Lake Hancock Target Range, Site EO351 Whidbey Island Naval Air Station, WA	Risk Assessment Code (RAC) Matrix					
Contract Number: N62470-08-D-1008 CTO No. JP01	Severity	Probability				
Date Prepared: May 1, 2012		Frequent Likely Occasional Seldom Unlikely				
Prepared by (Name/Title): Jennifer L. Peters, Sr. Environmental, Health, and Safety Specialist	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
Reviewed by (Name/Title): Roger Margotto, CIH, PESM	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L
Notes: (Field Notes, Review Comments, etc.) In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP/SSHP. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures. Personal protective equipment will consist of hard hat (if overhead hazards exist), safety-toed boots, safety glasses, standard work uniform (long pants, ¾-length sleeve shirt), hearing protection (as required), work gloves (when indicated), and high-visibility safety vest.	Step 1: Review each “Hazard” with identified safety “Controls” and determine RAC (see above).					
	“Probability” is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.				RAC Chart	
	“Severity” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.				E = Extremely High Risk	
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on the AHA. Annotate the overall highest RAC at the top of the AHA.				H = High Risk	
				M = Moderate Risk		
				L = Low Risk		

AHA #1 – Job/Task: Mobilization/Demobilization			
Job Steps	Hazards	Controls	RAC
1. Driving vehicles and parking vehicles at entry locations to Lake Hancock Target Range; leaving the range in vehicles	Vehicle hazards, traffic hazards such as being struck by vehicle, vehicle rolling.	Park in a location that is off the road such as pull-outs, or park within the gated area when possible. Look before opening the door when exiting or entering vehicle on road side. Wear high-visibility safety vest when exiting or entering vehicle and when working around the vehicle when traffic is present. Use spotter for backing up vehicle. Wear seatbelt when in vehicle. Use headlights when operating vehicle. Lock the gate after entry into the site or after leaving the site. Only authorized personnel will operate Tetra Tech project vehicles, and operators will have a valid driver’s license. Set parking brake when parking. Do not position your back facing traffic; unload equipment from the door not on the traffic side, and set up gear away from the road. Follow posted speed limits and established traffic routes.	M

AHA #1 – Job/Task: Mobilization/Demobilization			
Job Steps	Hazards	Controls	RAC
2. Preparing to leave parking area for site work areas or returning to truck at end of the day	Slip, trip, and fall hazards could be present.	Visually inspect work areas and eliminate slip, trip, and fall hazards if feasible. Keep work areas neat and orderly. Always place supplies in areas away from normal foot traffic, and equipment and tools in a safe location that does not present a trip hazard. Workers should not stand or walk on either equipment or supplies. Load/unload on even terrain. Park in area that allows best access to the site. Utilize existing paths and roads to the extent possible.	M
	Workers could experience strains from manually moving materials and equipment or placing gear onto their backs.	Direct personnel to use proper lifting techniques, such as keeping the back straight, lifting with the legs without twisting, and getting help when moving bulky/heavy materials and equipment. Employees will not lift more than 50 pounds alone. Encourage a steady, sustainable work pace. Share loads of equipment and materials amongst the team.	M
	Sharp objects could cause cut or puncture injuries to workers.	Wear cut-resistant work gloves when handling sharp edges, items with pinch points, materials, etc. Blunt sharp edges whenever practical. Use retractable blade cutting tools.	
	Lack of emergency preparedness.	Have safety briefing before leaving for the site. Ensure routes of access and egress are discussed and that personnel know the routes to the hospital (see Figure 9-1 in the APP), who has the vehicle keys, who has what emergency equipment, etc. Stage an emergency drill before beginning fieldwork or on the first day of fieldwork.	
	Missing or non-functioning field gear and equipment could lead to an emergency in the field for which team is unprepared or extra foot travel back and forth to vehicle which can lead to exhaustion.	During safety briefing, team will ensure that each one has (in their backpack of gear): <ul style="list-style-type: none"> • At least two cellular telephones (charged); verify outside line connectivity • First aid kit • Air horn • Sufficient drinking water and electrolyte fluids • Field maps and emergency information (Emergency Plan and phone numbers, routes to hospital) • Broad spectrum sunscreen, barrier cream and poisonous plant soap, DEET • Flashlight • Sufficient layers of clothing for heat and cold stress • Each person's prescription medicine (e.g., for stings) • Personal flotation device • Other necessary gear and equipment as dictated by activities 	
	Workers could be injured by high winds or lightning.	SSHO checks weather forecast prior to leaving the truck for the work area. Shut down work when wind speed is greater than 25 mph sustained, and follow the 30/30 rule in the event of lightning in the area. Monitor the local weather report daily and as necessary for any severe weather warnings. Know the procedures to follow in the event of severe weather emergencies.	M

AHA #1 – Job/Task: Mobilization/Demobilization		
Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements
1. Site vehicles	Drivers must have current state-issued driver's license.	Receipt inspection by Equipment Supervisor (FOL). Vehicle inspection by drivers. Operator's manual for each vehicle must be located with the vehicle.
2. Magnetometers	Only qualified UXO technicians trained on care and use of magnetometers.	Receipt inspection by UXO technician. Daily inspection by UXO technician. Successful completion of function test in accordance with site ESS DR and SOPs in the Work Plan.
3. Hand and power tools	Training in use of hand and power tools by the SSHO or designee and review of operating manual. Use proper hand tool for the task.	Daily inspection by users/operators.
4. Fire extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.
5. First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking.

Abbreviations and Acronyms:

AHA – Activity Hazard Analysis
 APP – Accident Prevention Plan
 CIH – Certified Industrial Hygienist
 EM – Engineer Manual
 ESS DR – Explosive Safety Submission Determination Request
 FOL – Field Operations Lead
 mph – miles per hour
 PE – Professional Engineer
 PESM – Project Environmental Safety Manager
 RAC – Risk Assessment Code
 SOP – Standard Operating Procedures
 SSHO – Site Safety and Health Officer
 SSHP – Site Safety and Health Plan

Activity Hazard Analysis (AHA) #2

Job/Task: Wetlands Delineation and Characterization	Overall Risk Assessment Code (RAC) (Use highest code)	M
Project Location: Lake Hancock Target Range, Site EO351 Whidbey Island Naval Air Station, WA	Risk Assessment Code (RAC) Matrix	
Contract Number: N62470-08-D-1008 CTO No. JP01	Severity	Probability
Date Prepared: May 1, 2012		Frequent Likely Occasional Seldom Unlikely
Prepared by (Name/Title): Jennifer L. Peters, Sr. Environmental, Health, and Safety Specialist	Catastrophic	E E H H M
	Critical	E H H M L
Reviewed by (Name/Title): Roger Margotto, CIH, PESM	Marginal	H M M L L
	Negligible	M L L L L
Notes: (Field Notes, Review Comments, etc.) In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP/SSHP. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures. Personal protective equipment will consist of hard hat (if overhead hazards exist), safety-toed boots, safety glasses, standard work uniform (long pants, ¾-length sleeve shirt), hearing protection (as required), work gloves (when indicated), and high-visibility safety vest.	Step 1: Review each “ Hazard ” with identified safety “ Controls ” and determine RAC (see above).	
	“ Probability ” is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.	RAC Chart
	“ Severity ” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.	E = Extremely High Risk
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on the AHA. Annotate the overall highest RAC at the top of the AHA.	H = High Risk
		M = Moderate Risk
		L = Low Risk

AHA #2 – Job/Task: Wetlands Delineation and Characterization			
Job Steps	Hazards	Controls	RAC
1. Accessing work locations on foot and walking the site to perform delineations and document GPS locations	MEC hazards within the area can present an explosion and fire hazard.	The UXO technician will follow the procedures in the Work Plan for MEC avoidance to provide safe access to the sites by the team. All areas where metallic anomalies are detected will be avoided. The UXO technician will function-test the magnetometer daily and document the function-test in the field logbook. Team members will follow the instruction of the UXO technician and stay behind him until directed to proceed. No suspect MEC will be handled during this project by anyone. The UXO technician will document munitions debris visually observed. Any suspected UXO visually identified by the UXO technician will also be documented by GPS coordinates and reported to the Navy RPM.	M

AHA #2 – Job/Task: Wetlands Delineation and Characterization			
Job Steps	Hazards	Controls	RAC
1. Accessing work locations on foot and walking the site to perform delineations and document GPS locations (cont'd)	Slip, trip, and fall hazards could be present.	Visually inspect work areas and eliminate slip, trip, and fall hazards if feasible. Keep work areas neat and orderly. Always place equipment and tools in a safe location that does not present a trip hazard. Workers should not stand or walk on either equipment or supplies. Load/unload on even terrain. Utilize existing paths and roads to the extent possible. Watch your footing and wear sturdy work boots. Pace yourself when walking. Avoid bluffs, pits, and depressions and warn others of the hazard if discovered. Stay more than 6 feet away from any edges where a fall of 6 feet or greater could occur.	M
	Workers could experience strains from manually moving materials and equipment or placing gear onto their backs.	Direct personnel to use proper lifting techniques, such as keeping the back straight, lifting with the legs without twisting, and getting help when moving bulky/heavy materials and equipment. Employees will not lift more than 50 pounds alone. Encourage a steady, sustainable work pace. Share loads of equipment and materials amongst the team.	M
	Sharp objects could cause cut or puncture injuries to workers.	Wear cut-resistant work gloves when handling sharp edges, items with pinch points, using tools, materials, etc. Blunt sharp edges whenever practical. Use retractable blade cutting tools. Wear leather safety toed work boots. Watch for broken tree limbs or any beaver chewed tree trunks of small diameter as these are sharpened to a point and could be stepped on or fallen onto.	
	Contact with poisonous plants, stinging or biting insects, or wild animals.	If poison oak, sumac, or ivy is present, wear barrier cream applied to exposed skin. Conduct safety briefing on the hazards (review HSG 2-8, Poison Ivy, Oak, and Sumac Contamination Control) of these plants and identification of the plants as specified in the SSHP Section 4.4.3. Have soap in first aid kit in the event of skin contact and treat as a potential emergency by observing for rash. Route around areas of poisonous plants. Report any potential contact with, or any rashes received to the SSHO.	
	Workers could be injured by high winds or lightning.	SSHO checks weather forecast prior to leaving the truck for the work area. Monitor the local weather report as necessary for any severe weather warnings. Shut down work when wind speed is greater than 25 mph sustained and follow the 30/30 rule in the event of lightning in the area. Seek shelter in the site vehicle with doors and windows closed if lightning is in the area. Know the procedures to follow in the event of severe weather emergencies.	M

AHA #2 – Job/Task: Wetlands Delineation and Characterization			
Job Steps	Hazards	Controls	RAC
1. Accessing work locations on foot and walking the site to perform delineations and document GPS locations (cont'd)	Heat or cold stress related illnesses or injuries – temperature extremes.	Follow procedures in the APP Section 9.8 for heat and cold stress and train employees in recognition of signs and symptoms of exposure. Drink plenty of fluids and electrolytes and carry sufficient drinking water into the field. Take breaks and rest, in heat find shade to rest in when possible. Layer clothing appropriately for the weather conditions. Keep feet dry and have a change of socks with you. Wear appropriate footwear if working in marshy areas which may consist of hip waders or rubber boots. Monitor each other for signs and symptoms of exposure and SSHO will do WGBT or physiological monitoring in accordance with EHS 4-6 – Temperature Extremes. Note that wearing raingear or hip waders can cause heat to build up and lead to higher degree of heat stress. Report to the SSHO if you need to take a break or are suffering any heat or cold related issues.	M
	Drowning hazards or water entrapment hazards.	Wear PFD when working within 6 feet of water more than 1 foot in depth. Use the buddy system at all times amongst the team. Test water depth before entry, even in shallow marshy areas as mud or uneven ground could be present that could cause one to get feet stuck and potentially fall over into the water. Be mindful of the tides. Incoming tides can cause surges into the wetlands making routes that were accessible earlier, inaccessible or challenging later. Ensure a means of egress out of an area if it could become inundated with water.	M
	Wildland fire hazards – burns or smoke inhalation.	Follow the procedures in Section 9.10 of the APP for wildland fire hazards. Be observant of smoke if seen or if odor is present and investigate the source to determine if it presents a hazard. Ensure egress routes out of the area are known as well as an alternate egress route depending on where the fire is headed. Watch the wind. Do not smoke in any location on site except for designated areas at the direction of the SSHO. There is no hot work allowed on this project. Dig permits will be obtained and underground utility locates will be performed following procedures described in the SSHP.	M
	Eye injuries – damage to eyes from punctures, dust, scratches, UV light.	Wear ANSI-approved Z87.1 safety glasses at all times. Wear shaded glasses appropriate for ambient conditions to protect from UV damage. First aid kit will have small portable eyewash bottle in it in the event something enters an eye. Have an emergency eye wash bottle in each field vehicle. Minimize generation of dusts. Flush objects from eyes; do not rub. Impaled objects will not be pulled free from eye. Report eye injuries to the SSHO promptly.	L

AHA #2 – Job/Task: Wetlands Delineation and Characterization			
Job Steps	Hazards	Controls	RAC
1. Accessing work locations on foot and walking the site to perform delineations and document GPS locations (cont'd)	Gunfire from trespassing hunters on the property.	If you hear gunfire on the property, leave the area in a direction opposite the gunfire and return to the site vehicle. If you see hunters on the property, leave the property and return to the project vehicle. Notify the NTR and the Task Order Manager so that base security can be notified. Personnel walking on the property will wear high-visibility safety vests at all times to be more visible to potential hunters on the property.	M

AHA #2 – Job/Task: Wetlands Delineation and Characterization		
Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements
1. Site vehicles	Drivers must have current state-issued driver's license.	Receipt inspection by Equipment Supervisor (FOL). Vehicle inspection by drivers. Operator's manual for each vehicle must be located with the vehicle.
2. Magnetometers	Only qualified UXO technicians trained on care and use of magnetometers.	Receipt inspection by UXO technician. Daily inspection by UXO technician. Successful completion of function test in accordance with site ESS DR and SOPs in the Work Plan.
3. Hand and power tools	Training in use of hand and power tools by the SSHO or designee and review of operating manual. Use proper hand tool for the task.	Daily inspection by users/operators.
4. Fire extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.
5. First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking.
6. GPS unit	Only qualified GIS technicians familiar and trained in use and calibration of GPS units will operate and use GPS units.	Receipt inspection by GIS Technician. Daily inspection and field calibration by GIS Technician.

Abbreviations and Acronyms:

AHA – Activity Hazard Analysis
 APP – Accident Prevention Plan
 CIH – Certified Industrial Hygienist
 EHS – environmental health and safety
 EM – Engineer Manual
 ESS DR – Explosive Safety Submission Determination Request
 FOL – Field Operations Lead
 GPS – global positioning system
 MEC – munitions and explosives of concern

mph – miles per hour
 PE – Professional Engineer
 PFD – personal flotation device
 PESM – Project Environmental Safety Manager
 RAC – Risk Assessment Code
 SOP – Standard Operating Procedures
 SSHO – Site Safety and Health Officer
 SSHP – Site Safety and Health Plan
 UXO – unexploded ordnance

Activity Hazard Analysis (AHA) #3

Job/Task: Soil Sampling	Overall Risk Assessment Code (RAC) (Use highest code)	M
Project Location: Lake Hancock Target Range, Site EO351 Whidbey Island Naval Air Station, WA	Risk Assessment Code (RAC) Matrix	
Contract Number: N62470-08-D-1008 CTO No. JP01	Severity	Probability
Date Prepared: May 1, 2012		Frequent Likely Occasional Seldom Unlikely
Prepared by (Name/Title): Jennifer L. Peters, Sr. Environmental, Health, and Safety Specialist	Catastrophic	E E H H M
	Critical	E H H M L
Reviewed by (Name/Title): Roger Margotto, CIH, PESM	Marginal	H M M L L
	Negligible	M L L L L
Notes: (Field Notes, Review Comments, etc.) In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP/SSHP. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures. Personal protective equipment will consist of hard hat (if overhead hazards exist), safety-toed boots, safety glasses, standard work uniform (long pants, ¾-length sleeve shirt), hearing protection (as required), work gloves (when indicated), and high-visibility safety vest.	Step 1: Review each “Hazard” with identified safety “Controls” and determine RAC (see above).	
	“Probability” is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.	RAC Chart
	“Severity” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.	E = Extremely High Risk
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on the AHA. Annotate the overall highest RAC at the top of the AHA.	H = High Risk M = Moderate Risk L = Low Risk

AHA #3 – Job/Task: Soil Sampling			
Job Steps	Hazards	Controls	RAC
1. Accessing soil sampling locations on foot	MEC hazards within the area can present an explosion and fire hazard.	The UXO technician will follow the procedures in the Work Plan for MEC avoidance to provide safe access to the sites by the team. All areas where metallic anomalies are detected will be avoided. The UXO technician will function-test the magnetometer daily and document the function-test in the field logbook. Team members will follow the instruction of the UXO technician and stay behind him until directed to proceed. No suspect MEC will be handled during this project by anyone. The UXO technician will document munitions debris visually observed. Any suspected UXO visually identified by the UXO technician will also be documented by GPS coordinates and reported to the Navy RPM.	M

AHA #3 – Job/Task: Soil Sampling			
Job Steps	Hazards	Controls	RAC
1. Accessing soil sampling locations on foot (cont'd)	Slip, trip, and fall hazards could be present.	Visually inspect work areas and eliminate slip, trip, and fall hazards if feasible. Keep work areas neat and orderly. Always place equipment and tools in a safe location that does not present a trip hazard. Workers should not stand or walk on either equipment or supplies. Load/unload on even terrain. Utilize existing paths and roads to the extent possible. Watch your footing and wear sturdy work boots. Pace yourself when walking. Avoid bluffs, pits, and depressions, and warn others of the hazard if discovered. Stay more than 6 feet away from any edges where a fall of 6 feet or greater could occur.	M
	Workers could experience strains from manually moving materials and equipment or placing gear onto their backs.	Direct personnel to use proper lifting techniques, such as keeping the back straight, lifting with the legs without twisting, and getting help when moving bulky/heavy materials and equipment. Employees will not lift more than 50 pounds alone. Encourage a steady, sustainable work pace. Share loads of equipment and materials amongst the team.	M
	Sharp objects could cause cut or puncture injuries to workers.	Wear cut-resistant work gloves when handling sharp edges, items with pinch points, using tools, materials, etc. Blunt sharp edges whenever practical. Use retractable blade cutting tools. Wear leather safety-toed work boots. Watch for broken tree limbs or any beaver-chewed tree trunks of small diameter as these are sharpened to a point and could be stepped on or fallen onto.	M
	Contact with poisonous plants, stinging or biting insects, or wild animals.	If poison oak, sumac, or ivy is present, wear barrier cream applied to exposed skin. Conduct safety briefing on the hazards (review HSG 2-8, Poison Ivy, Oak, and Sumac Contamination Control) of the plants as specified in the SSHP. Have soap in first aid kit in the event of skin contact and treat as a potential emergency by observing for rash. Route around areas of poisonous plants. Report any potential contact with, or any rashes received to the SSHO.	M
	Workers could be injured by high winds or lightning.	SSHO checks weather forecast prior to leaving the truck for the work area. Monitor the local weather report as necessary for any severe weather warnings. Shut down work when wind speed is greater than 25 mph sustained and follow the 30/30 rule in the event of lightning in the area. Seek shelter in the site vehicle with doors and windows closed if lightning is in the area. Know the procedures to follow in the event of severe weather emergencies.	M

AHA #3 – Job/Task: Soil Sampling			
Job Steps	Hazards	Controls	RAC
1. Accessing soil sampling locations on foot (cont'd)	Heat or cold stress related illnesses or injuries – temperature extremes.	Follow procedures in the APP Section 9.8 for heat and cold stress and train employees in recognition of signs and symptoms of exposure. Drink plenty of fluids and electrolytes and carry sufficient drinking water into the field. Take breaks and rest; in heat, find shade to rest in when possible. Layer clothing appropriately for the weather conditions. Keep feet dry and have a change of socks on hand. If working in marshy areas, wear appropriate footwear which may consist of hip waders or rubber boots. Monitor each other for signs and symptoms of exposure; SSHO will do WGBT or physiological monitoring in accordance with EHS 4-6 – Temperature Extremes. Note that wearing raingear or hip waders can cause heat to build up and lead to a higher degree of heat stress. Report to the SSHO if you need to take a break or are suffering any heat or cold related issues.	M
	Drowning hazards or water entrapment hazards.	Wear PFD when working within 6 feet of water more than 1 foot in depth. Use the buddy system at all times amongst the team. Test water depth before entry, even in shallow marshy areas as mud or uneven ground could be present that could cause one to get feet stuck and potentially fall over into the water. Be mindful of the tides. Incoming tides can cause surges into the wetlands making routes that were accessible earlier inaccessible or challenging later. Ensure a means of egress out of an area if it could become inundated with water.	M
	Wildland fire hazards – burns or smoke inhalation.	Follow the procedures in Section 9.10 of the APP for wildland fire hazards. Be observant of smoke if seen or if odor is present and investigate the source to determine if it presents a hazard. Ensure egress routes out of the area are known as well as an alternate egress route depending on the direction the fire is spreading. Watch the wind. Do not smoke in any location on site except for designated areas at the direction of the SSHO. There is no hot work allowed on this project. Dig permits will be obtained and underground utility locates will be performed following procedures described in the SSHP.	M

AHA #3 – Job/Task: Soil Sampling			
Job Steps	Hazards	Controls	RAC
1. Accessing soil sampling locations on foot (cont'd)	Eye injuries – damage to eyes from punctures, dust, scratches, UV light.	Wear ANSI-approved Z87.1 safety glasses at all times. Wear shaded glasses appropriate for ambient conditions to protect from UV damage. First aid kit will have small portable eyewash bottle in it in the event something enters an eye. Have an emergency eye wash bottle in each field vehicle. Minimize generation of dusts. Flush objects from eyes with water; do not rub. Impaled objects will not be pulled free from eye. Report eye injuries to the SSO promptly.	L
	Gunfire from trespassing hunters on the property.	If you hear gunfire on the property, leave the area in a direction opposite the gunfire and return to the site vehicle. If you see hunters on the property, leave the property and return to the project vehicle. Notify the NTR and the Task Order Manager so that base security can be notified. Personnel walking on the property will wear high-visibility safety vests at all times to be more visible to potential hunters on the property.	M
2. Excavation of holes (limited to 18 inch depth) for collection of soil samples	MEC, if present could cause an explosion and fire upon contact.	UXO technician will screen each sample location for metallic objects using the handheld magnetometer to assure MEC avoidance for the team. The technician will follow MEC avoidance procedures in the Work Plan. The magnetometer will be function checked daily by the UXO technician. If metallic objects are detected, there will be no digging in that area and another location will be chosen.	M
	Contact with underground utilities could present a hazard of electrocution or explosion.	Follow the NASWI Base dig permit system. Follow procedures in the APP Section 4.1.3 and EHS 3-15 for call-before-you-dig and utility clearance requirements. In addition, the magnetometer on site can be used to find linear features that may be utilities; however, this is limited to metallic lines, and if metallic objects are located, there will be no digging allowed.	M

AHA #3 – Job/Task: Soil Sampling			
Job Steps	Hazards	Controls	RAC
2. Excavation of holes (limited to 18 inch depth) for collection of soil samples (cont'd)	Potential arsenic (naturally occurring) in soil – dermal contact, ingestion, inhalation.	Soil could potentially contain arsenic (arsenic is naturally occurring) at low levels. Wear gloves when contacting the soil. Minimize generation of dust. Wash hands with soap and water after handling soil and before eating, drinking, or smoking. If other indicators of contamination such as odors and visible staining are present, stop and collect samples in a different location and report the findings to the TOM, NTR, RPM, and PESM.	L
	Tool use could cause injury (shovel, hand auger, trowel).	Use the right tool for its intended function. Use tools in an ergonomic manner and minimize stooping or bending and repetition. Do not use defective or damaged tools. Wear gloves when using hand augurs, shovels, or trowels. Procedure EHS 3-11 will be followed for proper tool use.	L
3. Collect and preserve soil samples	Contact, inhalation, or ingestion of sample preservative zinc acetate.	Ensure MSDS for zinc acetate (preservation chemical for sulfide analysis) is onsite and available for review by the sampling team. Wear nitrile gloves during all sample processing. Minimize any handling of the zinc acetate directly where it can contact skin. Minimize handling of dry zinc acetate when it is windy. Wear safety glasses when sampling. Have hand wash station accessible for washing hands and/or face if contact with the preservative is made. Follow the sampling and analysis plan for preservation of samples.	L
4. Transport coolers containing samples back to project vehicle	Heavy lifting of coolers containing samples and sample ice packs could cause back strain and fatigue.	Break up the load amongst the field team or team carry coolers back to project vehicle. Do no load coolers full of samples. Test the load periodically to determine if the cooler is full while sampling so that it does not get overloaded. Take rest breaks as necessary and to reposition.	M

AHA #2 – Job/Task: Wetlands Delineation and Impact Study		
Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements
1. Site vehicles	Drivers must have current state-issued driver's license.	Receipt inspection by Equipment Supervisor (FOL). Vehicle inspection by drivers. Operator's manual for each vehicle must be located with the vehicle.
2. Magnetometers	Only qualified UXO technicians trained on care and use of magnetometers.	Receipt inspection by UXO technician. Daily inspection by UXO technician. Successful completion of function test in accordance with site ESS DR and SOPs in the Work Plan.
3. Hand and power tools	Training in use of hand and power tools by the SSHO or designee and review of operating manual. Use proper hand tool for the task.	Daily inspection by users/operators.
4. Fire extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.
5. First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking.
6. GPS Unit	Only qualified GIS technicians familiar and trained in use and calibration of GPS units will operate and use GPS units.	Receipt inspection by GIS technician. Daily inspection and field calibration by GIS technician.
7. Sample Equipment	The FOL will ensure the SAP is properly implemented for the collection of samples.	Daily prior to mobilizing to the site.

Abbreviations and Acronyms:

AHA – Activity Hazard Analysis
 APP – Accident Prevention Plan
 CIH – Certified Industrial Hygienist
 EHS – environmental health and safety
 EM – Engineer Manual
 ESS DR - Explosive Safety Submission Determination Request
 FOL – Field Operations Lead
 GPS – global positioning system
 MEC – munitions and explosives of concern
 mph – miles per hour
 MSDS – material safety data sheet
 NASWI – Naval Air Station Whidbey Island

NTR – Naval Technical Representative
 PE – Professional Engineer
 PFD – personal flotation device
 PESM – Project Environmental Safety Manager
 RAC – Risk Assessment Code
 RPM – Remedial Project Manager
 SAP – Sampling and Analysis Plan
 SOP – Standard Operating Procedures
 SSHO – Site Safety and Health Officer
 SSHP – Site Safety and Health Plan
 TOM – Task Order Manager
 UXO – unexploded ordnance