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REVISED ACCIDENT PREVENTION PLAN AND SITE SAFETY AND HEALTH PLAN FOR GROUNDWATER BACKGROUND STUDY WITH TRANSMITTAL NS MAYPORT FL
7/6/2012
TETRA TECH

TETRA TECH

Document Tracking Number 12JAX0127

July 6, 2012

Project Number 112G03797

Naval Facilities Engineering Command, Southeast
ATTN: Mr. Brian Syme (OPC 6)
Remedial Project Manager
135 Ajax Street North, Building 903
Naval Air Station Jacksonville
Jacksonville, FL 32212-0030

Reference: CLEAN Contract Number N62470-08-D-1001
Contract Task Order Number JM71

Subject: Revised Final Accident Prevention Plan and Site Safety and Health Plan for Groundwater Background Study at Naval Station (NAVSTA) Mayport, Jacksonville, Florida

Dear Mr. Syme:

Tetra Tech is pleased to submit the Revised Final Accident Prevention Plan and Site Safety and Health Plan for Groundwater Background Study at NAVSTA Mayport, Jacksonville, Florida. This document was prepared for the United States Navy, Naval Facilities Engineering Command Southeast under Contract Task Order (CTO) JM71 for the Comprehensive Long-term Environmental Action Navy (CLEAN) Contract Number N62470-08-D-1001. Copies of this report have also been provided to the NAVSTA Mayport Partnering Team as indicated below.

If you have any questions with regard to this submittal, please feel free to contact me at (904) 730-4669, extension 220, or via e-mail at Ben.Marshall@TetraTech.com.

Sincerely,

Ben Marshall, P.E.
Project Manager

BM/lc

Enclosure

c: Paul Malewicki, NAVSTA Mayport
John Winters, FDEP (courtesy CD)
RDM, Tetra Tech Pittsburgh (hardcopy and CD)
CTO JM71 Project File

Tetra Tech, Inc.
8640 Philips Highway, Suite 16, Jacksonville, FL 32256
Tel 904.636.6125 Fax 904.636.6165 www.tetratech.com

Comprehensive Long-term Environmental Action Navy

CONTRACT NUMBER N62470-08-D-1001

Revised Final

Accident Prevention Plan and Site Safety and Health Plan for Groundwater Background Study

Naval Station Mayport
Jacksonville, Florida

Contract Task Order JM71

June 2012

NAVFAC
Naval Facilities Engineering Command
NAVFAC SOUTHEAST

NAS Jacksonville
Jacksonville, Florida 32212-0030

TETRA TECH

ACCIDENT PREVENTION PLAN AND SITE SAFETY AND HEALTH PLAN

FOR

GROUNDWATER BACKGROUND STUDY

AT

NAVAL STATION MAYPORT

MAYPORT, FLORIDA

Prepared For:

NAVFAC SE
P. O. BOX 30 BLDG. 903
NAS JACKSONVILLE, FL 32212

Prepared By:

TETRA TECH
234 MALL BOULEVARD, SUITE 260
KING OF PRUSSIA, PENNSYLVANIA 19406

Prepared Under:

CONTRACT NUMBER N62470-08-D-1001
CONTRACT TASK ORDER JM71

JUNE 2012

PREPARED UNDER THE SUPERVISION OF:

BEN MARSHALL, PE
PROJECT MANAGER
TETRA TECH
JACKSONVILLE, FLORIDA

APPROVED FOR SUBMISSION BY:

MATTHEW M. SOLTIS, CIH, CSP
CLEAN HEALTH AND SAFETY MANAGER
TETRA TECH
PITTSBURGH, PENNSYLVANIA

ACRONYMS

§	Section
ACGIH	American Conference of Governmental Industrial Hygienists
AHA	Activity Hazard Analysis
ANSI	American National Standards Institute
APP	Accident Prevention Plan
BBP	Bloodborne pathogen
BLS	Bureau of Labor Statistics
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CO/COR	Contracting Officer/Representative
COC	Chemicals of Concern
CPR	Cardiopulmonary resuscitation
CRZ	Contamination Reduction Zone
CSP	Certified Safety Professional
CTO	Contract Task Order
DART	Days Away/Restricted Duty/Transfer
dB	decibels
DOD	Department of Defense
DOT	Department of Transportation
EM	Engineer Manual
EPA	Environmental Protection Agency
FDEP	Florida Department Environmental Protection
FOL	Field Operations Leader
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSM	Health and Safety Manager
MSDS	Material Safety Data Sheet
MSL	Mean Sea Level
NAICS	North American Industry Classification System
NAVFAC	Naval Facilities Engineering Command
NRL	Naval Research Laboratory
NRR	Noise Reduction Rating
OSHA	Occupational Safety and Health Administration (U.S. Department of Labor)
PE	Professional Engineer
PHSO	Project Health and Safety Officer
PM	Project Manager
POC	Point of Contact

PPE	Personal Protective Equipment
QC	Quality Control
RCIR	Recordable Case Incident Rate
RPM	Remedial Project Manager
SAP	Sampling and Analysis Plan
SAR	Small Arms Range
SI	Site Inspection
SOP	Standard Operating Procedure
SSO	Site Safety Officer
SSHP	Site Safety and Health Plan

ACCIDENT PREVENTION PLAN

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1.0 SIGNATURE SHEET

Prepared by:

James K. Laffey
Tetra Tech
Project Health and Safety Officer

Signature

(412) 921-8678
Phone

Prepared Under the Supervision of:

Ben Marshall, PE
Tetra Tech
Project Manager

Signature

(904) 730-4669
Phone

Concurred by:

John Trepanowski, PE
Tetra Tech
Program Manager

Signature

(610) 491-9688
Phone

2.0 BACKGROUND INFORMATION

Contractor: Tetra Tech
Contract Number: N62470-08-D-1001 CTO JM71
Project Name: Groundwater Background Study

2.1 PROJECT DESCRIPTION

This Accident Prevention Plan (APP) and Site Safety and Health Plan (SSHP) have been prepared to support sampling activities for a Groundwater Background Study at Naval Station (NAVSTA) – Mayport, Florida. It presents support to the technical approach described in the Uniform Federal Policy (UFP) - Sampling and Analysis Plan (SAP).

Tetra Tech shall perform a Groundwater Background Study for metals at NAVSTA Mayport in compliance with Florida Department Environmental Protection (FDEP) guidance. In addition to the SSHP the UFP SAP must be on site during Groundwater Background Study.

This APP addresses only the activities to be performed by Tetra Tech and its sub-contractor personnel. The site-specific health and safety provisions in this document have been developed for use during the provision of the Groundwater Background Study.

This document addresses applicable items specified under the U.S. Army Corps of Engineers Safety and Health Requirements Manual, Engineering Manual (EM) 385-1-1, and United States Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) standard Title 29 of Code of Federal Regulations (CFR), § 1910.120 and 1910.126.

This APP is available to on-site personnel who may be exposed to hazardous on-site conditions, including Tetra Tech and subcontractor personnel participating in field activities, and site visitors, including regulatory agency representatives. Site-specific sections of EM 385-1-1 applicable to this field effort are as follows. If the box is checked “Yes” the topic listed is applicable, and if it box is check “NA” it is not applicable to this project:

Yes NA

☒ ☐ 1 - Program Management
☒ ☐ 2 - Sanitation
☒ ☐ 3 - Medical and First Aid Requirements
☐ ☒ 4 - Temporary Facilities

☒ ☐ 5 - Personal Protective and Safety Equipment
☒ ☐ 6 - Hazardous Substances, Agents, and Environments
☐ ☒ 7 - Lighting
☒ ☐ 8 - Accident Prevention Signs, Tags, Labels, Signals, Piping System Identification, and Traffic Control
☐ ☒ 9 - Fire Prevention and Protection
☐ ☒ 10 - Welding and Cutting
☐ ☒ 11 - Electrical
☒ ☐ 12 - Control of Hazardous Energy
☒ ☐ 13 - Hand and Power Tools
☒ ☐ 14 - Material Handling, Storage, and Disposal
☐ ☒ 15 - Rigging
☒ ☐ 16 - Machinery and Mechanized Equipment
☐ ☒ 17 - Conveyors
☒ ☐ 18 - Motor Vehicles and Aircraft
☐ ☒ 19 - Floating Plant and Marine Activities
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☐ ☒ 27 - Concrete and Masonry Construction and Steel Erection
☒ ☐ 28 - HAZWOPER
☐ ☒ 29 - Blasting
☐ ☒ 30 - Contract Diving Operations

This APP and SSHP has been developed using the latest available information regarding known or suspected chemical contaminants and potential physical hazards associated with the proposed work at the site. These documents will be modified if new information becomes available. Changes will be made with the approval of the Tetra Tech Project Health and Safety Officer (PHSO), and the Tetra Tech Corporate Manager of Health and Safety who serves as the Health and Safety Manager (HSM). Requests for modifications to the SSHP will be directed to the Site Safety Officer (SSO), who will determine if the changes are necessary. The SSO will notify the Project Manager (PM), who will notify affected personnel of changes. The information contained in this plan, as well as policies on conducting on-site operations, have been obtained from the Tetra Tech Health and Safety Program, and supporting Standard Operating Procedures (SOPs).

2.2 SITE MAPS

The facility location map (Figure 2-1) showing where Tetra Tech employees will be performing work is included.

FIGURE 2-1
FACILITY LOCATION MAP

2.3 WORK PHASES

Work on this project will occur in the following phases. Associated dates when Tetra Tech personnel will be on site performing work will be listed for each phase of the project following authorization to proceed.

- Phase 1 – Mobilization
- Phase 2 – Groundwater Background Study activities, including monitoring well installation and multimedia sampling
- Phase 3 – Demobilization

3.0 STATEMENT OF SAFETY AND HEALTH POLICY

Tetra Tech is committed to providing our employees with a safe and healthful workplace. It is the goal of Tetra Tech to continue excellent safety performance on Naval Facilities Engineering Command (NAVFAC) contracts to support the Navy in their safety efforts. Specifically, Tetra Tech will perform work in a manner that is consistent with the Zero Incident Philosophy. It is our goal to plan and perform the work in a manner that integrates safety and health considerations so that worker injuries or illnesses, environmental releases/impacts, or property damage are eliminated. In addition to the line and staff management functions described in this APP and the accompanying SSHP, each individual performing work under this contract has the responsibility for their own personal health and safety, as well as assisting in assuring the health and safety of their co-workers. This element is also the first one listed in our corporate Health and Safety Policy Statement, which requires that "each employee recognize a *personal* responsibility for their own health and safety and for actions that affect the health and safety of fellow employees." This employee responsibility includes observing specified health and safety requirements and communicating with the designated SSO on matters such as the effectiveness of specified control measures, identification of new potential hazards, and other related issues.

An employee's failure to adhere to the requirements of this APP and SSHP or to observe specified safety requirements and restrictions or to properly use identified protective equipment may lead to injury or illness. As a result, deviation from safety and health procedures is not tolerated. Failure to comply with health and safety procedures and requirements will lead to reprimand up to and including dismissal.

Health and safety-related information is communicated to employees through meetings, postings, written communications, and reporting of hazards.

The principal elements of our program are founded on the requirements presented in the Health and Safety Policy in Figure 3-1.

FIGURE 3-1
HEALTH AND SAFETY POLICY

TETRA TECH NUS, INC.
HEALTH AND SAFETY POLICY

Tetra Tech NUS, Inc., is committed to providing our employees with a safe and healthful workplace. We believe that occupational injuries and illness can be prevented; and we are convinced that a strong Health and Safety Program is essential to achieve this objective.

The principal elements of our program are founded on the requirements that our managers and employees:

- **Recognize a *personal responsibility* for their own health and safety and for actions that affect the health and safety of fellow employees.**
- **Integrate safety and health into *all aspects* of their work, with the well-being of employees as the primary concern in all activities.**
- **Comply with applicable *federal, state, and local regulations*, as well as with our internal Corporate and our clients' safety and health policies and procedures.**
- **Take *an active role* in the Health and Safety Program by providing input and constructive criticism for improvements to the program.**

Mark T. Perry

Mark T. Perry, P.E.
President

Matthew M. Soltis

Matthew M. Soltis, CIH, CSP
Health and Safety Manager

Tetra Tech NUS. Inc.
January 2010

3.1 TETRA TECH SAFETY STATISTICS

Table 3-1 presents safety statistics for Tetra Tech for the last 3 calendar years compared to the national averages for our industry. This comparison uses data collected by the United States Department of Labor, Bureau of Labor Statistics (BLS) for different types of employers, segregated by North American Industry Classification System (NAICS) codes.

TABLE 3-1

COMPARISON OF TETRA TECH AND 2010 BLS DATA FOR NAICS CODE 541 (RCIR AND DART CASE RATES)

	NAICS 541 Professional, Scientific and Technical Services 2010	Tetra Tech 2009	Tetra Tech 2010	Tetra Tech 2011
Total Recordable Case Incident Rate (RCIR)	1.0	0.2	0.6	0
Days Away/Restricted Duty/Transfer Case Rate (DART)	0.3	0.2	0.2	0

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

Tetra Tech Man Hours Worked

2009	890,072
2010	900,132
2011	872,801

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

2009-2010:	0.74
2010-2011:	0.76
2011-2012:	0.78

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

Summary of Work-Related Injuries and Illnesses

Year 2009

U.S. Department of Labor
Occupational Safety and Health Administration
Form approved OMB no. 1218-0176

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

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

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

Number of Cases

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

Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
0	38
(K)	(L)

Injury and Illness Types

Total number of... (M)

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

Establishment information

Your establishment name Tetra Tech NUS, Inc.

Street 661 Andersen Drive, Foster Plaza 7

City Pittsburgh State PA Zip 15220

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

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

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

Employment information

Annual average number of employees 437

Total hours worked by all employees last year 890,072

Sign here

Knowingly falsifying this document may result in a fine.

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

Company executive

President
Title

(626) 470-2819
Phone

13-Jan-10
Date

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

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

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

Log of Work-Related Injuries and Illnesses

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

Year 2009

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

Form approved OMB no. 1218-0176

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

Establishment name: Tetra Tech NUS, Inc.

City: Pittsburgh State: PA

Identify the person				Describe the case		Classify the case											
						CHECK ONLY ONE box for each case based on the most serious outcome for that case:				Enter the number of days the injured or ill worker was:		Check the "injury" column or choose one type of illness:					
(A) Case No.	(B) Employee's Name	(C) Job Title (e.g., Welder)	(D) Date of injury or onset of illness (mo./day)	(E) Where the event occurred (e.g. Loading dock north end)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (e.g. Second degree burns on right forearm from acetylene torch)	Death	Days away from work	Remained at work		Away From Work (days)	On job transfer or restriction (days)	(M) Injury	Skin Disorder	Respiratory Condition	Poisoning	Hearing Loss	All other illnesses
								Job transfer or restriction	Other record-able cases								
						(G)	(H)	(I)	(J)	(K)	(L)	(1)	(2)	(3)	(4)	(5)	(6)
NUS-2009-10	XXXXXXXXXXXXXX	Environmental Engineer	9/4/2009	MarkWest Energy - E&S Permits	Sprained right ankle while walking a gas pipeline			X			38	X					
					Page totals	0	0	1	0	0	38	1	0	0	0	0	0

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

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

Page 1 of 1

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

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

Year 2010

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

Form approved OMB no. 1218-0176

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

Number of Cases

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

Number of Days

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

Injury and Illness Types

Total number of...
(M)

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

Establishment information

Your establishment name Tetra Tech NUS, Inc.

Street Foster Plaza 7, 661 Andersen Drive

City Pittsburgh State Pennsylvania Zip 15220

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

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

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

Employment information

Annual average number of employees 465

Total hours worked by all employees last year 900,132

Sign here

Knowingly falsifying this document may result in a fine.

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

Mark T. Fahy
Company executive

President
Title

(412) 921-7217
Phone

28-Jan-11
Date

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

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

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

Log of Work-Related Injuries and Illnesses

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

Year 2010

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

Form approved OMB no. 1218-0176

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

Establishment name Tetra Tech NUS, Inc.

City Pittsburgh State PA

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

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

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

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

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

Year 2011

U.S. Department of Labor
Occupational Safety and Health Administration
Form approved OMB no. 1218-0176

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

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

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

Number of Cases

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

Number of Days

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

Injury and Illness Types

Total number of… (M)

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

Establishment Information

Your establishment name Tetra Tech NUS, Inc.

Street 661 Andersen Drive, Foster Plaza 7

City Pittsburgh State Pennsylvania Zip 15220

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

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

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

Employment information

Annual average number of employees 436

Total hours worked by all employees last year 872801

Sign here

Knowingly falsifying this document may result in a fine.

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

Mark T. [illegible]
Company executive

President
Title

(412) 921-7217
Phone

1/23/12
Date

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

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

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

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

Year 2011

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

Form approved OMB no. 1218-0176

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

Establishment name: Tetra Tech - 112 NUS

City: Pittsburgh State: PA

Identify the person			Describe the case			Classify the case											
						CHECK ONLY ONE box for each case based on the most serious outcome for that case:				Enter the number of days the injured or ill worker was:		Check the "injury" column or choose one type of illness:					
(A) Case No.	(B) Employee's Name	(C) Job Title (e.g., Welder)	(D) Date of injury or onset of illness (mo./day)	(E) Where the event occurred (e.g. Loading dock north end)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (e.g. Second degree burns on right forearm from acetylene torch)	Death	Days away from work	Remained at work		Away From Work (days)	On job transfer or restriction (days)	(M) Injury	Skin Disorder	Respiratory Condition	Poisoning	Hearing Loss	All other illnesses
								Job transfer or restriction	Other record-able cases								
						(G)	(H)	(I)	(J)	(K)	(L)	(1)	(2)	(3)	(4)	(5)	(6)
					Page totals	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

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

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

Page 1 of 1

4.0 RESPONSIBILITIES AND LINES OF AUTHORITY

Tetra Tech, as the employer for the staff that will be engaged in performing the work presented in this APP, fully recognizes and accepts the ultimate responsibility for protecting the safety and health of our employees, and for the implementation of an effective Safety and Occupational Health program. The Tetra Tech SSO for this project has been appointed by the PM and is responsible for field implementation of tasks and procedures contained in the SSHP (see Appendix A) portion of the APP. The SSO has completed 40-Hour HAZWOPER and subsequent 8-Hour HAZWOPER Refresher Training, 8-Hour HAZWOPER Supervisor Training, OSHA 10 or 30 hour Construction Safety Training, and First Aid/CPR and Blood-borne Pathogen training in accordance with regulatory requirements applicable to the work that will be performed for this project. The Tetra Tech SSO has primary responsibility for responding to and correcting emergency situations and for taking appropriate measures to ensure the safety of site personnel and the public (e.g., evacuation of personnel from the site area). The SSO is also responsible for ensuring that corrective measures have been implemented, appropriate internal and Navy authorities have been notified, and follow-up reports have been completed.

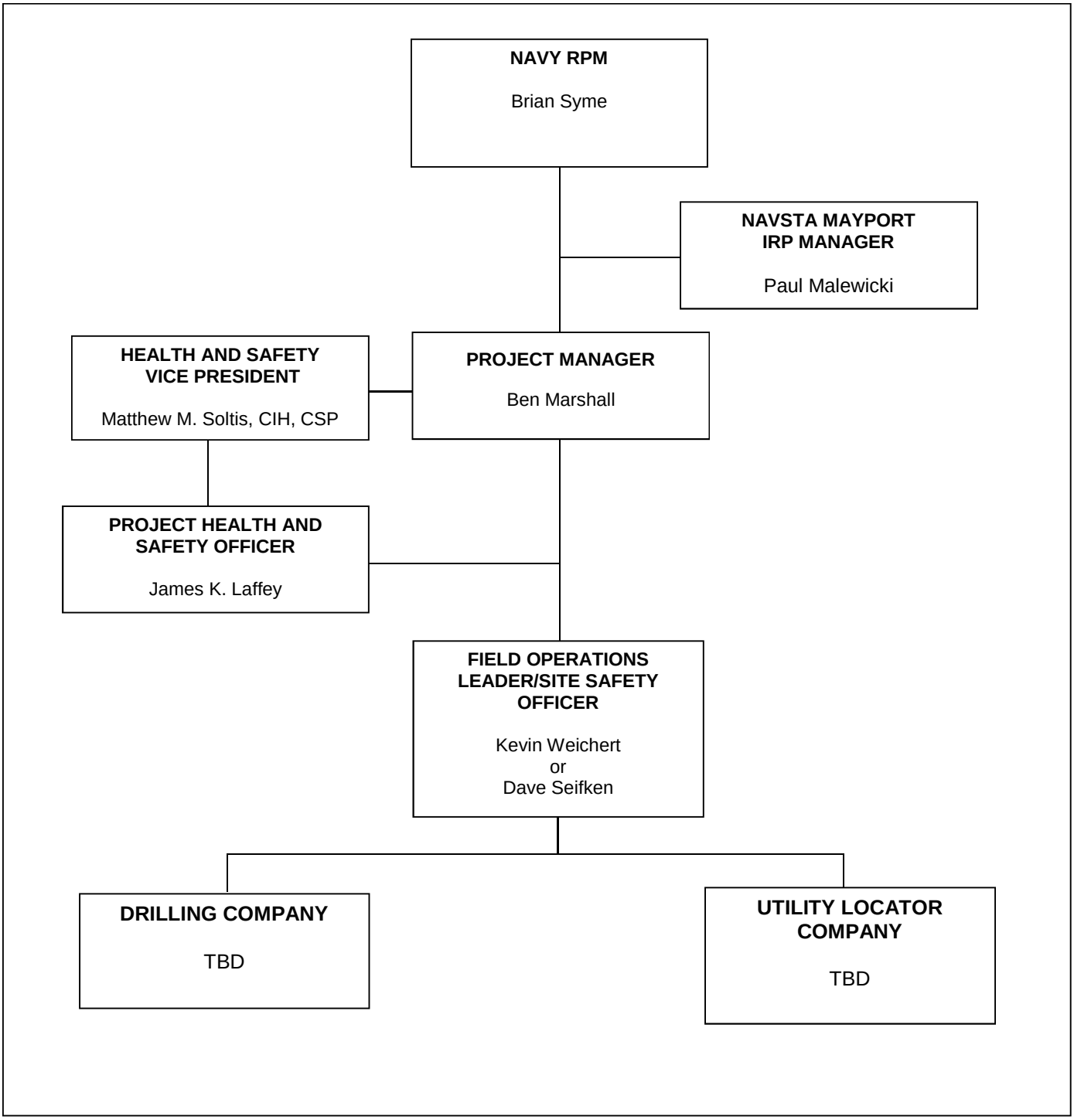
Individual subcontractors are required to cooperate with the SSO within the parameters of their Scope of Work.

Personnel are required to immediately report injuries, illnesses, spills, fires, and property damage to the SSO. The SSO must be notified of any on-site emergencies and is responsible for ensuring that the appropriate emergency procedures described in this section are followed. The SSO is also responsible for informing the Navy RMP of major incidents within four hours of occurrence.

The work under this contract, including this field effort, is subject to a comprehensive health and safety program developed, designed, and implemented by Matthew M. Soltis, CIH, CSP. Mr. Soltis serves as Vice President of Health and Safety for Tetra Tech TSS and as the Safety and Health Manager (HSM) for the planned work addressed in this APP. He has over 25 years of experience in the Health and Safety field.

Management at Tetra Tech has the authority and responsibility for implementing and maintaining this APP and SSHP. An organization chart presenting the lines of authority is provided as Figure 4-1.

FIGURE 4-1
ORGANIZATION CHART
FIELD ACTIVITIES AT NAVSTA MAYPORT



4.1 KEY PROJECT PERSONNEL AND ORGANIZATION

This section defines responsibility for safety and health for Tetra Tech and subcontractor employees engaged in onsite activities. Personnel assigned to these positions will exercise the primary responsibility for onsite health and safety. These persons will be the primary point of contact for any questions regarding the safety and health procedures and the selected control measures that are to be implemented for onsite activities.

4.1.1 Project Manager

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

- Work is appropriately planned and executed in accordance with contractual, regulatory, and internal requirements.

- Adequate resources (including personnel, equipment, and supplies) are assembled, and made available to the Field Operations Leader (FOL) to safely and effectively accomplish the work.

4.1.2 Project Health and Safety Officer

The PHSO is responsible for developing this APP and SSHP in accordance with applicable OSHA regulations. Specific responsibilities include:

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

4.1.3 Field Operations Leader/Site Safety Officer

The Tetra Tech FOL is responsible for implementation of the SSHP and in accordance with the contractual requirements serves as the project SSO. The FOL/SSO manages field activities, executes the SAP, and enforces safety procedures as applicable to the SAP. Other duties include:

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

Included in the FOL/SSO responsibilities are air monitoring, establishing a decontamination protocol, and ensuring the signing of the Daily Tailgate Safety Meeting form and the Site-Specific Training Documentation Form by personnel working on site.

The FOL/SSO will have advanced field work experience (minimum of 1 year) and be familiar with health and safety requirements specific to the project. The SSO will have the following additional specific responsibilities:

- Coordinating health and safety activities
- Selecting, applying, inspecting, and maintaining personal protective equipment
- Establishing work zones and control points
- Implementing air monitoring procedures
- Implementing hazard communication, respiratory protection, and other associated safety and health programs.
- Coordinating emergency services
- Providing elements of site-specific training

Compliance with the requirements stipulated in this APP and SSHP is monitored by the FOL/SSO and coordinated through the Tetra Tech HSM. In some cases one person may be designated responsibilities for more than one position. This action will be performed only as credentials, experience, and availability permits.

4.1.4 Health and Safety and Health Manager

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

- Developing, maintaining, and overseeing implementation of this APP and SSHP.
- Visiting project sites as needed to audit the effectiveness of the APP and SSHP.
- Remaining available for project emergencies.
- Developing modifications to the APP and SSHP, as needed.
- Evaluating occupational exposure monitoring/air sampling data and adjusting APP and SSHP as necessary.
- Serving as a Quality Control (QC) staff member.
- Approving the APP and SSHP by signature.

4.1.5 Site Personnel

In addition to the line and staff management functions, each individual performing work under this contract has the responsibility for their own personal health and safety, as well as assisting in assuring the health and safety of their co-workers. This employee responsibility includes observing specified health and safety requirements and communicating with the FOL/SSO on matters such as the effectiveness of specified control measures, identification of new potential hazards, and other related issues.

An employee's failure to adhere to the requirements of this Accident Prevention Plan, the Project Specific Work and Safety Plans, or to observe specified safety requirements and restrictions or to properly use identified protective equipment may lead to injury or illness. As a result, deviation from safety and health procedures is not tolerated. Failure to comply with health and safety procedures and requirements will lead to reprimand up to and including dismissal.

Health and safety-related information will be communicated to employees through meetings, postings, written communications, and reporting of hazards.

4.2 GENERAL SAFETY AND HEALTH PROVISIONS COMPETENT PERSON

An OSHA "competent person" is defined as "one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them". By way of training and/or experience, a competent person is knowledgeable of applicable standards, is capable of identifying workplace hazards relating to the specific operation, and has the authority to correct them. Some standards add additional specific requirements which must be met by the competent person. The FOL/SSO is the competent person for the tasks that will be performed during this project.

The SSO, or assignee, will conduct daily pre-shift tailgate safety meetings discussing the planned site activities, the hazards associated with each task, and the training required of personnel involved in these tasks. The related personal protective equipment or related work equipment will be inspected by the competent/qualified person before any work is started. No work will be conducted unless the SSO or task applicable Competent Person is present. The SSO will be the competent person provided by Tetra Tech to oversee site work.

The SSO is an experienced field supervision in environmental site investigation activities. The SSO meets the requirements as defined in the definitions of EM 385-1-1, OSHA 29 CFR Part 1920, and 29 CFR Part 1926 for knowledge of HAZWOPER and applicable construction safety. The qualifications of the SSO are included in Attachment I.

4.3 REQUIREMENTS OF PRE-TASK SAFETY AND HEALTH ANALYSIS

Tetra Tech requires that an Activity Hazard Analysis (AHA) be prepared for each job task to be performed at this site to identify hazards before they occur and provide mitigation measures. The AHAs focus on the relationship between the worker, the task, the tools, and the work environment. The AHAs are reviewed at the tail gate safety meeting at the beginning of each work day. These sessions inform each person of the potential hazards for each task and give steps to take to eliminate or reduce them to an acceptable risk level. The AHAs are found in the SSHP in Section 2.0.

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

and reported to the SSO for resolution. Near miss incidents are to be reported to the SSO who will record the information in the site logbook and in the Tetra Tech TOTAL System.

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

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

4.3.1 APP and SSHP Compliance

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

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

In the Tetra Tech Health and Safety Program Summary it is stated by the company Chief Executive Officer Mr. Daniel L. Batrack, "Management is responsible for ensuring that all aspects of the workplace, including offices and project locations, are safe and that any risks, hazards, and safety violations are brought to their attention, investigated, and corrected promptly."

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

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

5.0 SUBCONTRACTORS AND SUPPLIERS

Tetra Tech will employ subcontractors in the performance of work covered by this APP and SSHP. Subcontractor personnel are required to read and comply with the sections of this Tetra Tech APP and SSHP. The subcontractor personnel entering the site must sign the Site-Specific Training Documentation form included in the APP and the individual AHAs included in the SSHP. Subcontractor personnel must comply with the applicable 29 CFR §1910.120 training and medical surveillance requirements. Subcontractors are responsible for providing personal protective equipment (PPE) needed to protect personnel as specified by their safety and health planning documents and by this APP, and are directly responsible for assuring the health and safety of their employees. Subcontractors who have not met OSHA training, medical surveillance, and PPE requirements are not permitted to enter areas where exposure to hazardous materials is possible.

This APP and associated SSHP shall be rigorously enforced during this field effort. Violators of the SSHP will be verbally notified upon first violation, and the violation will be noted by the Tetra Tech SSO in a field logbook. Upon second violation, the violator will be notified in writing, and the Tetra Tech PM and the violator's supervisor will be notified. A third violation will result in a written notification and the violator's eviction from the sites. The written notification will be sent to the human resources development and the HSM.

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

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

At least one copy of this APP and the SSHP will always be available to site personnel. Each vehicle taken to the job site will contain a copy of the APP and the SSHP to ensure quick and easy access by employees. Minor changes in the SSHP procedures will be discussed at the beginning of each work day by the SSO at the daily tailgate safety meeting. Significant SSHP revisions must be discussed with the HSM and PM and approved via the SSHP amendment form.

6.0 TRAINING

Tetra Tech's emphasis on safety is introduced at the time of hire. New employees receive general safety orientation training along with unit specific programs and processes. Tetra Tech continues to strengthen and foster this culture of safety with employees through ongoing training, mentoring, and regular communications.

Personnel who may be exposed to hazardous conditions and who will participate in site activities are required to meet the training requirements outlined in OSHA 29 CFR §1910.120, HAZWOPER. Furthermore, site personnel must satisfy any specialized training requirements that are presented in the AHAs for tasks to be completed under this CTO.

6.1 MANDATORY TRAINING AND CERTIFICATIONS

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

- 40 hours of introductory hazardous waste site training prior to performing work at NAVSTA Mayport.
- Three days actual field experience for on-site managers, supervisors and general site workers (under the direction of a skilled supervisor).
- 8 hours of refresher training within the past 12 months before being cleared for site work. (Field personnel who have had introductory training more than 12 months prior to site work must complete this training again.)
- 8-hour supervisory training in accordance with 29 CFR 1910.120(e)(4) will be required for site personnel operating in a supervisory capacity.
- 10 or 30-hour OSHA Construction Safety Training for the FOL/SSO.
- At least two site personnel will be trained in basic First Aid and cardio pulmonary resuscitation.
- Department of Transportation (DOT) training for employees preparing DOT shipping papers, hazardous waste manifests and labeling packaging and/or markings containers for transport.

Documentation of Tetra Tech introductory, supervisory, and refresher training as well as site-specific training will be maintained at the site.

6.2 SITE-SPECIFIC SAFETY AND HEALTH TRAINING

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

6.3 TRAINING DOCUMENTATION

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

6.4 MEDICAL SURVEILLANCE

Site personnel will have had a physical examination by a board certified occupational health medicine physician that meets the requirements of Tetra Tech's medical surveillance program. Documentation for medical clearances will be maintained in the Tetra Tech Pittsburgh office and made available, as necessary, and will be documented using Attachment I of the SSHP for every employee participating in on-site work activities at the sites.

7.0 SAFETY AND HEALTH INSPECTIONS

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

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

Daily site safety inspections shall be conducted by the Tetra Tech SSO during this field effort to ensure safe work areas and compliance with the SSHP.

7.1.1 Proof of Inspector's Training/Qualifications

The corporate safety staff and the SSO are certified as HAZWOPER Supervisors under OSHA 29 CFR 1910.120(e)(4).

7.1.2 Inspection Schedule

The corporate safety staff conducts unannounced random onsite safety audits. The SSO conducts inspections at the beginning of each shift and as necessary through the duration of the project.

7.1.3 Documentation Procedures

The corporate safety staff reviews the findings of the audit with the FOL and SSO. The audit is then filed with the project files. The SSO records any deficiencies in the Field Log Book which is maintained on site for the site practices.

7.1.4 Deficiency Tracking System and Follow-up Procedures

The items noted during field audits will be communicated to the Tetra Tech HSM who maintains a corrective/preventive action database. Responsibility for resolving each item noted during these audits is assigned and tracked through resolution. Results from field audits are also regularly communicated throughout Tetra Tech through training and electronic means as a method of continuous program improvement.

8.0 ACCIDENT REPORTING

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

Hazardous work conditions or unsafe work practices will be corrected in a timely manner, both in the field and in the office. Upon discovery of an unsafe condition at a field site, the degree of hazard must be assessed and action may range from complete shutdown of the operation to phased correction. The Tetra Tech employees working on this project will have "Stop Work" authority in the event that a potentially serious action or condition is observed. Tetra Tech will shut down a project during which life threatening, severe environmental impact, or significant equipment or property damage conditions may exist. Employees shall follow specific information for emergency evacuation and PPE usage as described in this APP and associated SSHP. The PM, Navy RPM, and NAVSTA Mayport Point of Contact (POC) must be notified within four hours of each incident.

8.1 INCIDENT REPORTING/NOTIFICATIONS

Incidents that must be reported to the include those that result in any of the following:

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

8.2 INCIDENT REPORTING PROCEDURES

The Tetra Tech online incident reporting system called TOTAL will be used for documenting of the information obtained at the time of the incident.

8.2.1 TOTAL Incident Reporting System

Site employees can use TOTAL to directly report health and safety incidents, notify key personnel, and initiate the process for properly investigating and addressing the causes of incidents, including near-miss events.

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

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

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

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

Incidents, including near-miss incidents, involving Tetra Tech personnel or Tetra Tech subcontractors under Tetra Tech's immediate direction shall be reported and investigated.

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

8.2.2 How to Access TOTAL to Report an Incident

Once on the “My Tetratech” web site (https://my.tetratech.com), TOTAL can be found under the “Health and Safety” tab, by clicking on the Incident Reporting, select “Report an Incident (TOTAL)”. Then, near the bottom of the screen, click on “Launch TOTAL Application”. This will connect you directly to TOTAL. Next, click on “Enter new incident”, and follow the steps as presented. The system was designed to be “fail safe” in that the employee will not be able to skip any required information. TOTAL can also be accessed directly from the internet using the following web address: http://totalhs.tetratech.com/.

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

If any Tetra Tech personnel are injured or develop an illness as a result of working on site, and they are at a remote location where they cannot establish reliable internet connection with TOTAL to report an incident, then the employee will complete a hard-copy Tetra Tech “Incident Report Form” and submit that to the HSM as soon as possible but not less than the same day as the event..

TETRA TECH, INC.
Safety Excellence

FIGURE 8-1
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)	☐ Complete IR Form Only
Injury or Illness	☐ Complete Form IR-A; Injury or Illness
Property or Equipment Damage, Fire, Spill or Release	☐ Complete Form IR-B; Damage, Fire, Spill or Release
Motor Vehicle	☐ Complete Form IR-C; Motor Vehicle

INFORMATION ABOUT THE INCIDENT

Description of Incident

_____

_____

_____

Date of Incident	Time of Incident
	_____ AM ☐ PM ☐ *OR* Cannot be determined ☐
Weather conditions at the time of the incident	**Was there adequate lighting?**
	_____ Yes ☐ No ☐

Location of Incident

_____ Was location of incident within the employer's work environment? Yes ☐ No ☐

Street Address	City, State, Zip Code and Country
Project Name/Number	**Client:**
Tt Supervisor or Project Manager	**Was supervisor on the scene?**
	Yes ☐ No ☐

WITNESS INFORMATION (attach additional sheets if necessary)

Name	Company
Street Address	**City, State and Zip Code**

Telephone Number(s)

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 ☐ Level - 2 ☐ None ☐

Root Cause Analysis Level Definitions

Level - 1	**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. The following events may trigger a Level 1 RCA: ▪ 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	**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. The following events will require a Level 2 RCA: ▪ 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 H&S Representative				
Operating Unit H&S Representative				
Other: _____				

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

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FIGURE 8-1
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? ☐ Tetra Tech subcontractor employee (directly supervised by Tt personnel)? ☐

Full Name	**Company (if not Tt employee)**
Street Address, City, State and Zip Code	**Address Type**
_____	Home address (for Tt employees) ☐
_____	Business address (for subcontractors) ☐

Telephone Numbers

Work: _____ Home: _____ Cell: _____

Occupation (regular job title)	**Department**
Was the individual performing regular job duties?	**Time individual began work**
Yes ☐ No ☐	_____ AM ☐ PM ☐ *OR* Cannot be determined ☐

Safety equipment

Provided? Yes ☐ No ☐

Used? Yes ☐ No ☐ If no, explain why

_____

_____

_____

Type(s) provided:
- ☐ Hard hat
- ☐ Gloves
- ☐ Eye protection
- ☐ Safety shoes
- ☐ Respirator
- ☐ Protective clothing
- ☐ High visibility vest
- ☐ Fall protection
- ☐ Machine guarding
- ☐ 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 ☐ No ☐
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 ☐ No ☐ If yes, request a copy of their completed investigation form/report and attach it to this report.

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FIGURE 8-1
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"

_____

_____

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

_____

_____

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

_____

_____

MEDICAL CARE PROVIDED

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

_____

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

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

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

SIGNATURES

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

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

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

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FIGURE 8-1
TETRA TECH, INC.
INCIDENT FORM IR-B

INSTRUCTIONS:

Complete all sections below for incidents involving property/equipment damage, fire, spill or release.
Do NOT leave any blanks.
Attach this form to the IR FORM completed for this incident.

Incident Report Number: (From the IR Form)	

TYPE OF INCIDENT (Check all that apply)

Property Damage ☐ Equipment Damage ☐ Fire or Explosion ☐ Spill or Release ☐

INCIDENT DETAILS

Results of Incident: Fully describe damages, losses, etc.

_____

_____

_____

Response Actions Taken:

_____

_____

_____

Responding Agency(s) (i.e. police, fire department, etc.)	**Agency(s) Contact Name(s)**

DAMAGED ITEMS (List all damaged items, extent of damage and estimated repair cost)

Item:	**Extent of damage:**	**Estimated repair cost**

SPILLS / RELEASES (Provide information for spilled/released materials)

Substance	**Estimated quantity and duration**	**Specify Reportable Quantity (RQ)**
		_____ Exceeded? Yes ☐ No ☐ NA ☐

FIRES / EXPLOSIONS (Provide information related to fires/explosions)

Fire fighting equipment used? Yes ☐ No ☐ If yes, type of equipment: _____

NOTIFICATIONS

Required notifications	**Name of person notified**	**By whom**	**Date / Time**
Client: _____ Yes ☐ No ☐			
Agency: _____ Yes ☐ No ☐			
Other: _____ Yes ☐ No ☐			

Who is responsible for reporting incident to outside agency(s)? Tt ☐ Client ☐ Other ☐ Name: _____

Was an additional written report on this incident generated? Yes ☐ No ☐ If yes, place in project file.

FIGURE 8-1
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 ☐ No ☐	Yes ☐ No ☐
Name and location of responding police department	**Ambulance company name and location**
Officer's name/badge #	

Did police complete an incident report? Yes ☐ No ☐ If yes, police report number: _____
Request a copy of completed investigation report and attach to this form.

VEHICLE INFORMATION

How many vehicles were involved in the accident? _____ (Attach additional sheets as applicable for accidents involving more than 2 vehicles.)

Vehicle Number 1 – Tetra Tech Vehicle		**Vehicle Number 2 – Other Vehicle**	
Vehicle Owner / Contact Information		**Vehicle Owner / Contact Information**	
Color		**Color**	
Make		**Make**	
Model		**Model**	
Year		**Year**	
License Plate #		**License Plate #**	
Identification #		**Identification #**	
Describe damage to vehicle number 1		**Describe damage to vehicle number 2**	
Insurance Company Name and Address		**Insurance Company Name and Address**	
Agent Name		**Agent Name**	
Agent Phone No.		**Agent Phone No.**	
Policy Number		**Policy Number**	

DRIVER INFORMATION			
Vehicle Number 1 – Tetra Tech Vehicle		**Vehicle Number 2 – Other Vehicle**	
Driver's Name		**Driver's Name**	
Driver's Address		**Driver's Address**	
Phone Number		**Phone Number**	
Date of Birth		**Date of Birth**	
Driver's License #		**Driver's License #**	
Licensing State		**Licensing State**	
Gender	Male ☐ Female ☐	**Gender**	Male ☐ Female ☐
Was traffic citation issued to Tetra Tech driver? Yes ☐ No ☐		Was traffic citation issued to driver of other vehicle? Yes ☐ No ☐	
Citation #		**Citation #**	
Citation Description		**Citation Description**	

PASSENGERS IN VEHICLES (NON-INJURED)			
List all non-injured passengers (excluding driver) in each vehicle. Driver information is captured in the preceding section. Information related to persons injured in the accident (non-Tt employees) is captured in the section below on this form. Injured Tt employee information is captured on FORM IR-A			
Vehicle Number 1 – Tetra Tech Vehicle		**Vehicle Number 2 – Other Vehicle**	
How many passengers (excluding driver) in the vehicle? ____		How many passengers (excluding driver) in the vehicle? ____	
Non-Injured Passenger Name and Address		**Non-Injured Passenger Name and Address**	
Non-Injured Passenger Name and Address		**Non-Injured Passenger Name and Address**	
Non-Injured Passenger Name and Address		**Non-Injured Passenger Name and Address**	

INJURIES TO NON-TETRATECH EMPLOYEES						
Name of injured person 1				**Address of injured person 1**		
Age	**Gender**	**Car No.**	**Location in Car**	**Seat Belt Used?**	**Ejected from car?**	**Injury or Fatality?**
	Male ☐ Female ☐			Yes☐ No☐	Yes☐ No☐	Injured ☐ Died ☐
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 ☐ Female ☐			Yes☐ No ☐	Yes ☐ No ☐	Injured ☐ Died ☐

OTHER PROPERTY DAMAGE	
Describe damage to property other than motor vehicles	
Property Owner's Name	**Property Owner's Address**

COMPLETE AND SUBMIT DIAGRAM DEPICTING WHAT HAPPENED

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

Based on a risk assessment of the planned activities, the following indicated plans are applicable to this work and are included in or appended to this APP.

Yes/NA		Yes/NA	
☐ ☒	Layout Plans	☐ ☒	Night Operations Lighting Plan
☐ ☒	Emergency Response Plans	☐ ☒	Fire Prevention Plan
☐ ☒	Procedures and Tests	☐ ☒	Wild Land Fire Management Plan
☒ ☐	Spill Plans	☐ ☒	Hazardous Energy Control (LO/TO) Plan
☐ ☒	Firefighting Plan	☐ ☒	Critical Lift Plan
☒ ☐	Posting of Emergency Telephone Numbers	☒ ☐	Contingency Plan for Severe Weather
☐ ☒	Man Overboard/Abandon Ship	☐ ☒	Float Plan
☒ ☐	Medical Support (Onsite/Offsite)	☐ ☒	Site-Specific Fall Protection & Prevention Plan
☒ ☐	Plan for Prevention of Drug and Alcohol Abuse	☐ ☒	Demolition Plan
☒ ☐	Site Sanitation Plan	☐ ☒	Excavation/Trenching Plan
☐ ☒	Access and Haul Road Plan	☐ ☒	Emergency Rescue (Tunneling) Plan
☐ ☒	Respiratory Protection Plan	☐ ☒	Underground Construction Fire Prevention and Protection Plan
☒ ☐	Health Hazard Control Program	☐ ☒	Compressed Air Plan
☒ ☐	Hazard Communication Program	☐ ☒	Formwork/Shoring Erection and Removal Plan
☐ ☒	Process Safety Management Plan	☐ ☒	Pre-Cast Concrete Plan
☐ ☒	Lead Abatement Plan	☐ ☒	Lift Slab Plan
☐ ☒	Asbestos Abatement Plan	☐ ☒	Steel Erection Plan
☐ ☒	Radiation Safety Program	☒ ☐	SSHP for HTRW Work
☐ ☒	Abrasive Blasting Plan	☐ ☒	Blasting Safety Plan
☒ ☐	Heat/Cold Stress Monitoring Plan	☐ ☒	Diving Plan
☐ ☒	Crystalline Silica Monitoring Plan	☐ ☒	Confined Space Program

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

9.1 LAYOUT PLANS

The deposition of mud and or other debris on public roads shall be minimized to the extent possible and in accordance with local requirements.

9.2 SPILL PLANS

Spill Plans for this site are found in Section 9.2 of the SSHP.

9.3 POSTING OF EMERGENCY TELEPHONE NUMBERS

See Table A-13-1 of the SSHP

9.4 MEDICAL SUPPORT (ONSITE/OFFSITE)

See Section 13.0 of the SSHP

9.5 PLAN FOR PREVENTION OF DRUG AND ALCOHOL ABUSE

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

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

Violation of this policy or any of its provisions may result in disciplinary action up to and including termination of employment. Employees may be subject to discipline up to and including termination for refusing to cooperate with searches or investigations, refusing to submit to screening, or failing to execute consent forms when required by supervisors.

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

9.6 SITE SANITATION PLAN

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

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

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

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

9.7 HEALTH HAZARD CONTROL PROGRAM

See Section 2.0 of the SSHP

9.8 HAZARD COMMUNICATION PROGRAM

See Section 10.5 of the SSHP

9.9 HEAT/COLD STRESS MONITORING PLAN

See Section 7.0 of the SSHP

9.10 FIRE PREVENTION PLAN

Proper housekeeping is an essential component of fire prevention. Rubbish pickup from each site will be arranged with site contacts as needed. Storage of excessive quantities of empty boxes and other

combustible materials is discouraged. Site personnel will avoid placing flammable materials near baseboard heaters. Storage of supplies and field equipment shall not be allowed to interfere with access to doors, exits, fire ladders, or fire extinguishers. Stairways will be kept clear of items that can be tripped over. The areas under stairways that are egress routes should will not be used to store combustibles. Section 13.0 discusses fire extinguishers.

9.11 CONTINGENCY PLAN FOR SEVERE WEATHER

Project tasks under this scope of work will be performed outdoors. As a result, inclement weather may be encountered. In the event that adverse weather conditions arise (electrical storms, hurricanes, etc.), the FOL and/or the SSO will be responsible for temporarily suspending or terminating activities until hazardous conditions no longer exist.

9.12 SSHP FOR HTRW WORK

See Appendix A.

10.0 RISK MANAGEMENT PROCESSES

The AHA defines the activity being performed, the hazards posed, and control measures required to perform the work safely. Site workers are briefed on the AHA before doing the work and their input is solicited before, during, and after the performance of work to further identify the hazards posed and control measures required. Figure A-2-1 in the SSHP details the AHAs for the activities being provided in support of the NAVSTA Mayport site investigation field activities.

APPENDIX A

SITE SAFETY AND HEALTH PLAN

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1.0 PLAN ORGANIZATION AND RESPONSIBILITIES

This SSHP has been developed to provide safe work practices and procedures for Tetra Tech and subcontractor personnel conducting site activities in support of the Remedial Investigation at Naval Station (NAVSTA) Mayport. The objective of the field work is to collect samples in order to obtain current analytical data to determine the nature and extent of potential contamination. Many chemicals of concern (COC) currently sampled for are metals that could be background. A metals background study for groundwater could potentially reduce some of the COCs which could reduce future long term monitoring costs and land use controls for NAVSTA Mayport.

This SSHP was developed using historical site background information regarding known or suspected chemical contaminants, previous site visits, and potential physical hazards that may be associated with the proposed work at the site. This SSHP will be modified, as necessary, if new information becomes available, and changes will be made with the approval of the Tetra Tech SSO and the Tetra Tech HSM. Requests for modifications to the SSHP should be directed to the SSO. The SSO will notify the HSM, who will then notify affected personnel of the changes.

1.1 STAFF ORGANIZATION, QUALIFICATIONS AND RESPONSIBILITIES

Section 4.0 of the APP outlines the project organization qualifications and responsibilities.

1.2 RESPONSIBILITIES OF HEALTH AND SAFETY PERSONNEL

The Tetra Tech HSM, dependent upon the contaminant-related hazards on the project, shall be a CIH and/or CSP.

- The HSM shall have 3 years of experience managing safety and occupational health at hazardous waste site cleanup operations.

- The HSM shall enlist the support of safety and occupational health professionals with appropriate education and experience when working on sites with multiple (chemical, safety, ionizing radiation) hazards.

- The HSM shall be responsible for the following actions:
  - Developing, maintaining, and overseeing implementation of the SSHP
  - Visiting the project as needed to audit the effectiveness of the SSHP
  - Remaining available for project emergencies

- Developing modifications to the SSHP as needed
- Evaluating occupational exposure monitoring/air sampling data and adjusting SSHP requirements as necessary
- Serving as a Quality Control staff member
- Approving the SSHP by signature.

The SSO is required at site operations.

- The SSO shall have a minimum 1 year experience implementing safety and occupational health procedures at cleanup operations.

- The SSO shall have training and experience to conduct exposure monitoring/air sampling and select/adjust protective equipment use.

- The SSO shall have the authority and is responsible for the following actions
  - Being present anytime cleanup operations are being performed to implement the SSHP.
  - Inspecting site activities to identify safety and occupational health deficiencies and correct them.
  - Coordinating changes/modifications to the SSHP with the SHM, site superintendent, and contracting officer.
  - Conducting project specific training.

1.3 STOP WORK AUTHORIZATION

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

1.4 SITE INFORMATION AND PERSONNEL ASSIGNMENTS

Site Name: NAVSTA Mayport **Address:** Mayport, Florida

Navy RPM: Brian Syme **Phone Number:** (904) 542-6151

Site Point of Contact: Paul Malewicki **Phone Number:** (904) 270-3188

Project Team:

Tetra Tech Personnel:	Discipline/Tasks Assigned:	Phone:
Ben Marshall	PM	(904) 730-4669 ext 220
TBD	FOL/SSO	TBD
Matthew M. Soltis, CIH, CSP	HSM	(412) 921-8912
James K. Laffey	PHSO	(412) 921-8678

Subcontractor Personnel:	Affiliation/Task Assigned:	Phone:
TBD		
TBD		
TBD		

1.5 SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

NAVSTA Mayport is located within the corporate limits of the city of Jacksonville, Duval County, Florida, approximately 12 miles to the northeast of downtown Jacksonville, and adjacent to the town of Mayport. The station complex is located on the northern end of a peninsula bound by the Atlantic Ocean to the east and the St. Johns River to the north and west. NAVSTA Mayport occupies the entire northern part of the peninsula except for the town of Mayport, located to the west between the station and the St. Johns River.

NAVSTA Mayport was commissioned in 1942 on approximately 700 acres of land. The station initially consisted of a harbor and an airfield located near the mouth of the St. Johns River. The harbor and airfield were constructed from the dredging and filling of Ribault Bay. The harbor was initially dredged to a depth of 29 ft below mean sea level (msl) and is referred to as the Mayport Turning Basin. The Mayport Turning Basin is surrounded on three sides by ship piers. The original mission of the station included use by patrol craft, target boats, and rescue boats. The station was placed in caretaker status from 1946 to 1948. In 1948, the station was reopened, and in 1952, an aircraft carrier was assigned to the station. The turning basin was dredged to a depth of 40 ft to allow aircraft carriers and other large ships to berth at NAVSTA Mayport. Dredge material was used to fill areas south of the turning basin, which increased the amount of uplands at NAVSTA Mayport.

NAVSTA Mayport provides all necessary support services for the surface fleet and aircraft stationed at or visiting Mayport. This support includes the Public Works Department which provides infrastructure support. Other services include personnel support, facilities support, and ship and aircraft repair and maintenance. Maintenance and repair operations for ships are carried out by two organizations at NAVSTA Mayport: Southeast Regional Maintenance Center, Jacksonville (SERMC), and Fleet Readiness Center Southeast (FRCSE). SERMC conducts and contracts repair and maintenance operations onboard ships at the piers and in the operations building. FRCSE conducts maintenance operations on aircraft launching and arresting systems in specific buildings on the station.

The Groundwater Background Study will be conducted in Group Areas I, II, and III. Figures A-1-1, A-1-2, and A-1-3 depict the areas where groundwater sampling will occur.

1.5.1 Group II SWMUs

The Group I SWMUs (consisting of SWMUs 2, 3, 4, 5, 22, and 56) are located in the southwest part of NAVSTA Mayport and include former landfills, dredge material handling areas, and other individual SWMUs. These SWMUs were incorporated into Group I because of their (1) proximity to each other; (2) common drainage to the Sherman Creek watershed; (3) similarity of past waste disposal activities; and (4) the potential for similar or related corrective measures. Group I SWMUs were ranked as Priority 1 because of a “high perceived risk” for numerous contaminants to be of large areal extent and to affect large volumes of soil and groundwater. An Interim Measure to remove PCB-contaminated soil was completed for SWMU 2.

1.5.2 Group III SWMUs

The Group II SWMUs (consisting of SWMUs 6, 7, 8, 9, 10, 11, 15, 28, and 15) are located along the northern part of NAVSTA Mayport contiguous with the St Johns River and include former hazardous and solid waste storage areas, and petroleum waste treatment and disposal areas. The SWMUs were incorporated into Group II because of their (1) proximity to each other; (2) nearness to the St Johns River; and (3) potential for similar or related corrective measures. Group II SWMUs were ranked as Priority 2 because of a “moderate perceived risk” for contaminants to be of moderate areal extent, affecting moderate volumes of soil and groundwater, and moderate potential for adverse impacts to ecological receptors by soil and groundwater.

1.5.3 Group IV SWMUs

The Group III SWMUs (consisting of SWMUs 1, 14, 17, 18, 19, 20, 21, 23, 24, 25, 44, 45 and 52) are located in the eastern part of NAVSTA Mayport adjacent to the Mayport Turning Basin and include isolated areas with suspected contaminants confined to localized areas. The SWMUs were incorporated into Group III because of their (1) proximity to the Mayport Turning Basin, the St Johns River, and the Atlantic Ocean; (2) similarity of surrounding land use; and (3) potential for similar or related corrective measures. Group III SWMUs were ranked as Priority 3 because of a “low perceived risk” for contaminants to be of localized areal extent and to affect small volumes of soil and groundwater.

1.6 CONTAMINATION CHARACTERIZATION

Within each specific SWMU area, groundwater may be contaminated with a variety of constituents. Previously collected groundwater data indicate there may be contamination present as a result of site uses.

FIGURE A-1-1

GROUP I AREA WELLS

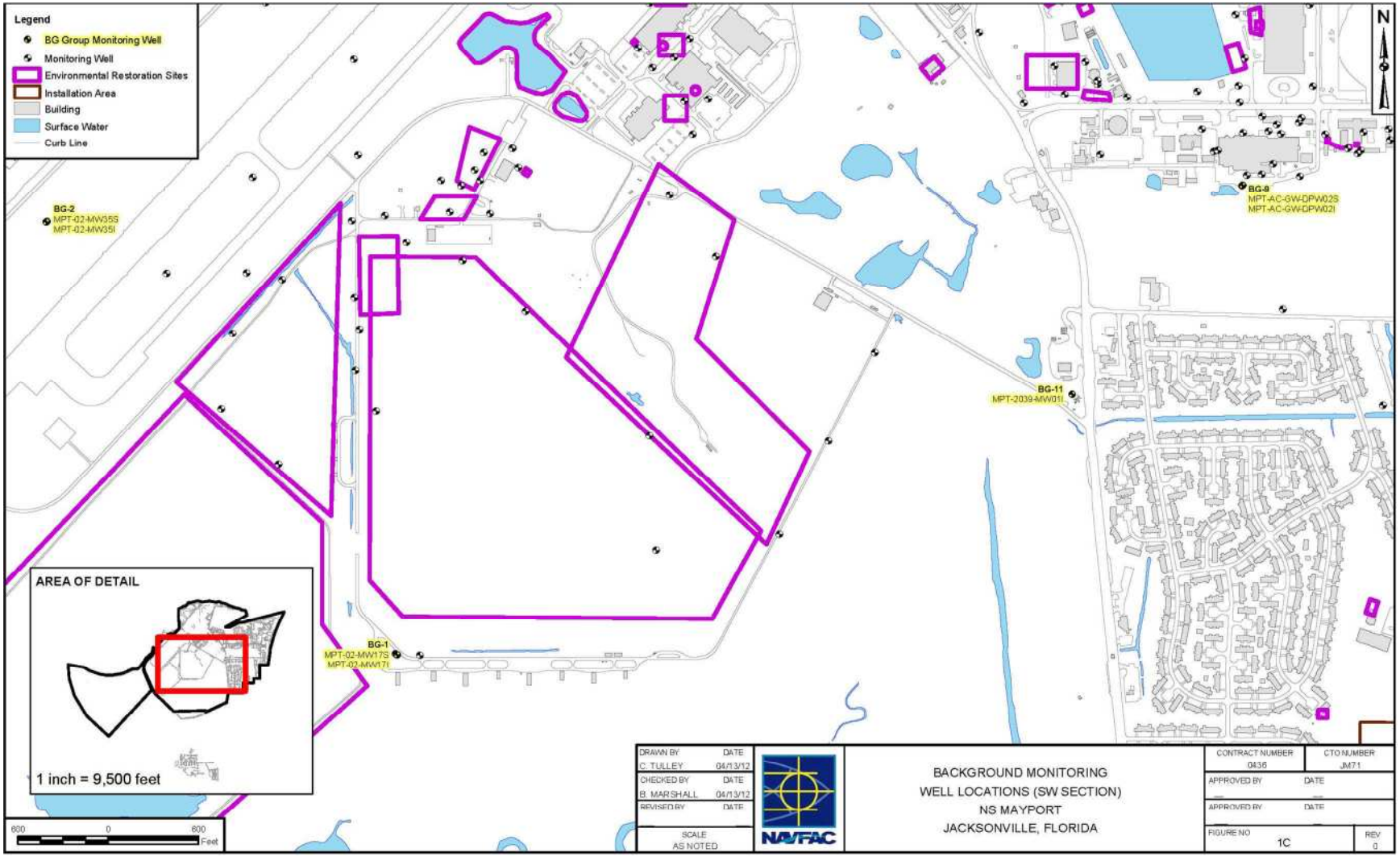


FIGURE A-1-2

GROUP III WELLS

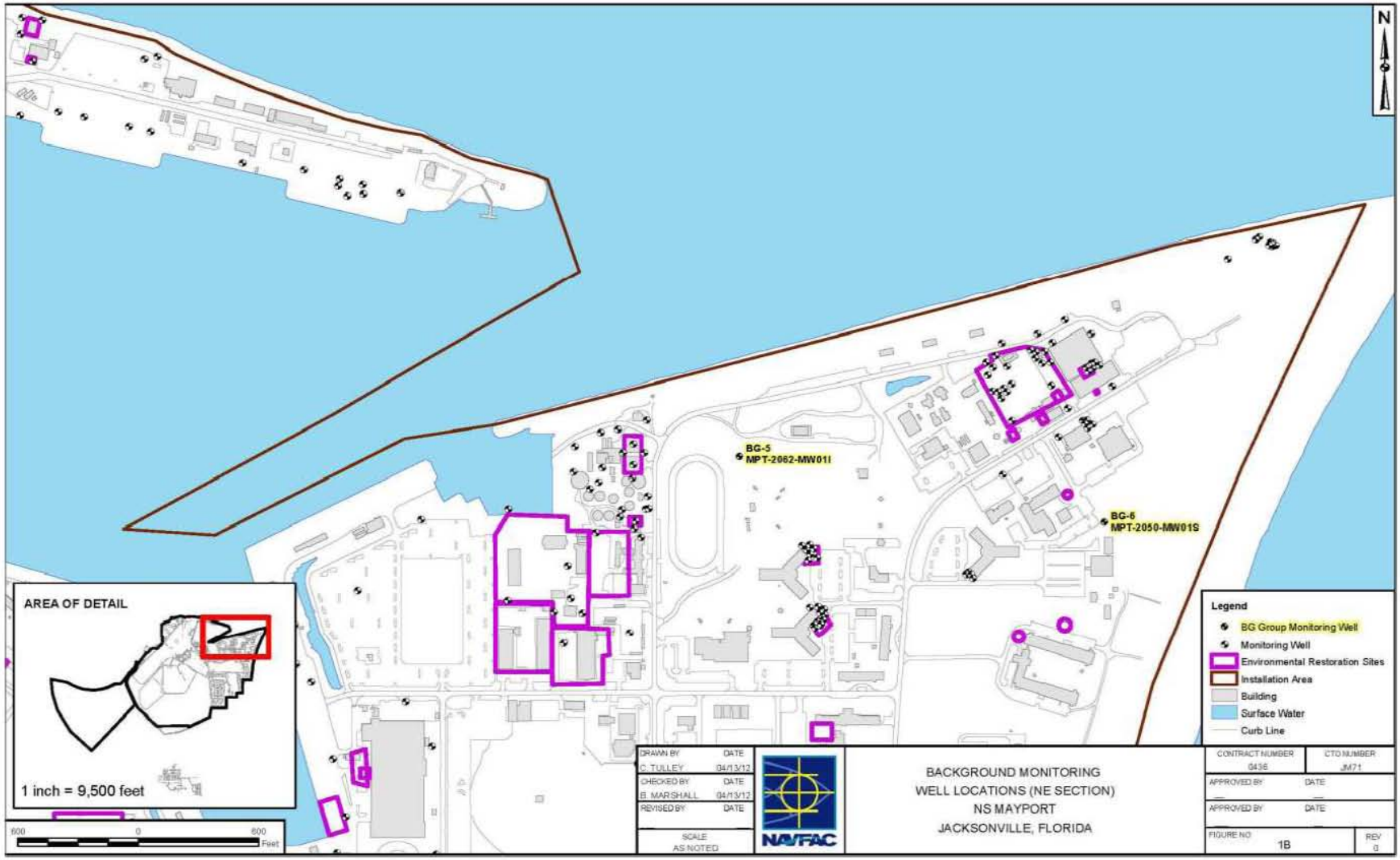
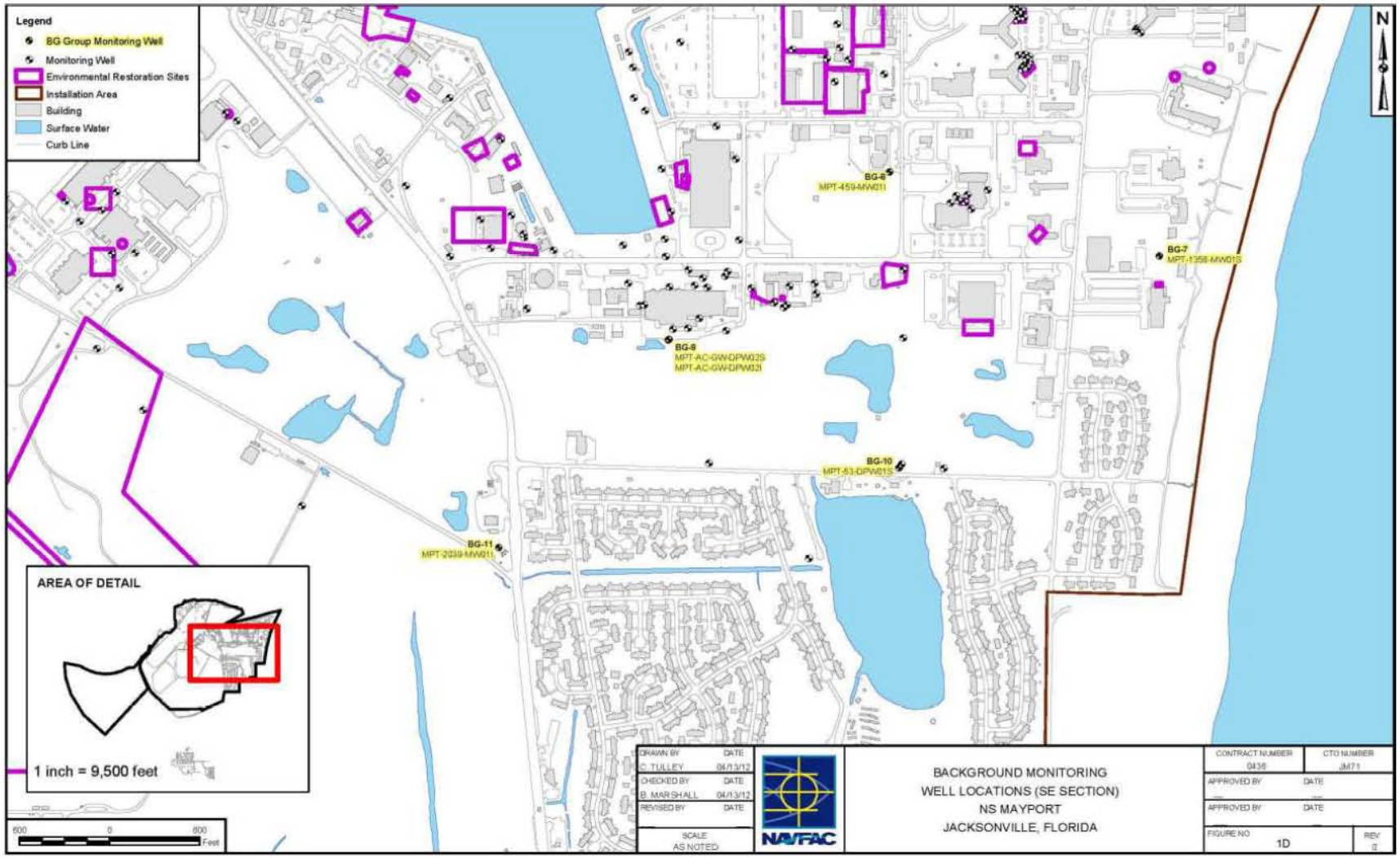


FIGURE A-1-3

GROUP III AREA WELLS



Fourth quarter 2011 groundwater sampling reported exceedances above no further action (NFA) groundwater cleanup target levels (GCTLs) for SWMUs 1, 23, 24 and 25, and identified only arsenic. In SWMUs 2, 3, 4, 5 and 22, the metals barium, cyanide, iron, manganese, sodium, and the miscellaneous parameters ammonia-n, chloride and sulfate were detected above the GCTL. At SWMUs 57, the SVOCs 2-methylnaphthalene and carbazole, and VOCs 1,4-dioxane and vinyl chloride were detected above the GCTL. However, none of these compounds are in concentrations above Occupational Exposure Limits (OELs). Table A-1-1 below shows VOCs compared to their current OELs.

TABLE A-1-1
VOLATILE ORGANICS
AND THEIR CURRENT OCCUPATIONAL EXPOSURE LIMITS

Contaminant of Concern	Maximum Concentration Previously Detected	Possible Worst-Case-Scenario Concentration	Current OEL
1,4-dioxane	4.15 ug/L	2.26E-4 ppm	OSHA: 100 ppm, TWA_8 (Skin Notation) ACGIH: 20 ppm TWA_8 (Skin Notation)
Vinyl Chloride	2.17 ug/L	0.97 ppm	ACGIH: 1 ppm OSHA: 1ppm 5 ppm STEL

Table Notes:
ug/L: micrograms per liter
ppm: parts per million
TWA8: Average air concentration over an 8-hour work period that is not to be exceeded
OSHA STEL: Concentration in air that is not to be exceed for more than 5 minutes in any 3 hour period

Because the metals are in groundwater, no dust generation should occur. Therefore it is unlikely that workers will be exposed to levels of metals that would pose adverse health effects. It addition, given the low levels of other COCs and the types of activities being performed, it is unlikely that workers will be exposed to levels of the other COCs that would pose adverse health effects either. Therefore, no specialized monitoring equipment will be required at any of the SWMUs during intrusive activities.

1.6.1 Properties and Exposure Signs/Symptoms

The physical effects of poisoning from the heavy metals tends to be a very slow process and occurs over a long period of continued exposure to the source of the toxic metal. The physical symptoms that are typically induced by the presence of toxic metals in the body tend to be very vague and can include symptoms such as persistent fatigue, the appearance of splitting and blinding headaches, the presence of an upset stomach, disorders such as colic, and even anemia in some cases. The central nervous system is the main part of the human body likely to be affected by the presence of toxic metals. Symptoms of a

disrupted central nervous system include the appearance of muscular tremors, the development of spells of dizziness, the presence of insomnia, the poor concentration abilities in the person, and a sudden lack of muscular coordination in the body.

The majority of SVOCs/VOCs are often related to chlorinated solvents and associated degradation products, paint thinners, dry cleaning solvents, constituents of petroleum fuels (e.g., gasoline and natural gas), and crude oil tanking. Symptoms of acute exposure to SVOCs/VOCs can include abdominal pain, irritation of the skin, eyes, nose, and throat, dizziness, tremors, vomiting, gastrointestinal bleeding, enlarged liver, pallor of the extremities, and frostbite like-symptoms. Short-term exposure to VOCs/SVOCs can cause irritation of the nose and throat and CNS depression with symptoms such as drowsiness, dizziness, giddiness, headache, loss of coordination. High concentrations have caused numbness and facial pain, reduced eyesight, unconsciousness, irregular heartbeat, and death. Very high concentrations have produced death due to CNS effects and, in rare cases, irregular heartbeat. Permanent CNS damage and/or liver injury have resulted from severe overexposure.

1.6.2 Potential Routes of Exposure

Inhalation - Based on the historical data and previous investigations at this worksite, worker exposure to airborne concentrations of any of the above listed COCs that could represent a health concern is considered to be unlikely.

Ingestion and Skin Contact - Potential exposure concerns to the primary COC may also occur through ingesting or coming into direct skin contact with contaminated water and soils, however the likelihood of worker exposure concerns through these two routes are also considered unlikely provided that workers follow good personal hygiene and good sample collection/sample handling practices, and wear appropriate PPE as specified in this SSHP. Examples of onsite practices that are to be observed that will protect workers from exposure via ingestion or skin contact include the following:

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

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2.0 HAZARD/RISK ANALYSIS

Work conducted in support of this project will be performed using AHA to guide and direct field crews on a task by task basis. See Figure A-2-1. It is the SSO's responsibility to review the AHAs with the task participants as part of a pre-task tail gate briefing session.

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

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

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

2.1 SPECIFIC SITE ACTIVITIES

The detailed Scope of Work for field activities to be performed for the remedial investigation at NAVSTA Mayport is presented in the Project-Specific SAP. For each of these tasks, detailed Activity Hazard Analyses (AHAs) have been prepared and are provided as Figure A-2-1.

If additional tasks are determined to be necessary, the SAP and this APP and SSHP will be amended and a hazard evaluation of the additional tasks performed. This APP and accompanying SSHP addresses proposed site activities that are to be conducted which include:

- Mobilization/Demobilization
- Monitoring Well
  - Installation with Hollow Stem Auger (HSA) or Direct Push Technology (DPT)
  - Development
- Groundwater sampling
- Decontamination

- Investigation-Derived Waste (IDW) Management
- Geographic Land Survey

These are the only activities that are anticipated to be necessary. If it becomes apparent that additional or modified tasks must be performed beyond those listed above, the work will only proceed after the FOL or SSO notifies the Project Manager and the HSM, so that any appropriate modifications to this SSHP can be developed and communicated to the intended task participants.

FIGURE A-2-1
Activity Hazard Analysis (AHA)

Activity/Work Task: Site Mobilization/Demobilization and Geographic Land Survey	Overall Risk Assessment Code (RAC) (Use highest code)	**M**
Project Location: NAVSTA Mayport, Florida	**Risk Assessment Code (RAC) Matrix**	
Contract Number: CTO JM71	**Severity** / **Probability**	
Date Prepared: May 1, 2012		
Prepared by: J. Laffey		
Reviewed by: J. Carothers, PhD		
Notes: (Field Notes, Review Comments, etc.)		

Severity	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Step 1: Review each **"Hazard"** with identified safety "Controls" and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and Identified as: Frequent, Likely, Occasional, Seldom, or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

- **E= Extremely High Risk**
- **H= High Risk**
- **M= Moderate Risk**
- **L= Low Risk**

JOB STEPS	HAZARDS	CONTROLS	RAC
• Assembling equipment and supplies • Performing initial/exit inspections of the intended work areas • Arranging for utilities, site access, notifying appropriate client contacts • Performing equipment inspections of vehicles and equipment arriving/preparing to depart the site • Conducting site land	1. Heavy Equipment	1. Conduct heavy initial site acceptance inspection prior to performing any work at this site. 2. Use the equipment inspection checklist for drill rigs in Attachment IV. Once the equipment passes inspection the AHA for Soil Boring with DPT or HSA will be followed.	**L**
	2. Minor cuts, abrasions or contusions	1. Wear cut-resistant gloves when handling items with sharp or rough edges.	**M**
	3. Heavy lifting (muscle strains and pulls)	1. Practice safe lifting techniques. Use mechanical lifting devices such as a dolly whenever possible 2. Ensure clear path of travel. 3. Have a good grasp on object. Perform "test lift" to gauge ability to safely make the lift. 4. Lift with legs not back. Obtain help when needed to lift large, bulky, or heavy items).	**M**
	4. Vehicular traffic when moving large equipment to the support area	1. Designate and mark vehicle and equipment staging areas. Inform the site personnel of heavy equipment areas and of their responsibility to stay clear of moving vehicles. 2. In high traffic areas, wear a high-visibility vest, shirt or jacket.	**M**
	5. Slips, Trips, Falls	1. Watch for tree branches, roots, weeds, limbs and other ground hazards.	**M**

ACTIVITY HAZARD ANALYSIS
Site Mobilization/Demobilization and GPS Locating
Page 2 of 3

JOB STEPS	HAZARDS	CONTROLS	RAC
survey		2. Wear appropriate foot protection to prevent slips and trips. 3. Use caution when working on uneven and wet ground surfaces.	
	6. Intermittent high noise levels	1. Site personnel are to wear hearing protection if noise levels are such that they must raise their voice in order to communicate with someone who is within arm's reach (approx. 2') of them. 2. SSO is responsible for determining and designating when hearing protection is required. 3. Hearing protection is to consist of either ear muffs or plugs that have a noise reduction rating (NRR) of at least 25 dB.	**L**
	7. Inclement weather	1. The FOL and/or the SSHO will temporarily suspend outside activities in the event of electrical storms or high winds. 2. It is preferred that supported systems such as lightning detection devices or emergency weather broadcasts are employed. 3. However, when this is not possible field personnel should use the 30/30 Rule: *"If there is less than 30 seconds between thunder and lightning go inside and stay inside for at least 30 minutes after the last thunder."*	**M**

Equipment To Be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Hand tools (dollies, hand carts, hand knives, etc.)	Review of AHA during pre-task tailgate safety briefing with the intended task participants.	Visual inspection prior to use by user. .
Personal Protective Equipment Minimum: Safety toe boots, safety glasses. Optional items: Hardhat, hearing protection, high-visibility clothing. **HTRW:** None anticipated for this task.	PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees' 40 hour HAZWOPER training, which is to be verified by the SSO through initial training documentation and review prior to permitting personnel to participate in any onsite activities, and will be confirmed by visual observations of worker activities.	Initial PPE inspection performed by SSO. Ongoing (prior to each use) inspections responsibilities of PPE users.

ACTIVITY HAZARD ANALYSIS
Site Mobilization/Demobilization and GPS Locating
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I have read and understand this AHA:

Name (Printed)	Signature	Date

FIGURE A-2-1 (Continued)
Activity Hazard Analysis (AHA)

Activity/Work Task: Monitoring Well Installation using HSA and DPT methods	Overall Risk Assessment Code (RAC) (Use highest code)	**M**
Project Location: NAVSTA Mayport, Florida	**Risk Assessment Code (RAC) Matrix**	
Contract Number: CTO JM71		
Date Prepared: May 1, 2012		
Prepared by: J. Laffey		
Reviewed by: J. Carothers, PhD		
Notes: (Field Notes, Review Comments, etc.)		

Severity	**Probability**				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	**E**	**E**	**H**	**H**	**M**
Critical	**E**	**H**	**H**	**M**	**L**
Marginal	**H**	**M**	**M**	**L**	**L**
Negligible	**M**	**L**	**L**	**L**	**L**

Step 1: Review each **"Hazard"** with identified safety "Controls" and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and Identified as: Frequent, Likely, Occasional, Seldom, or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

- **E= Extremely High Risk**
- **H= High Risk**
- **M= Moderate Risk**
- **L= Low Risk**

JOB STEPS	HAZARDS	CONTROLS	RAC
HSA Drill/DPT Rig set up and operation • Positioning Unit (engaging outriggers. etc.) • Assembling equipment and supplies	1. Struck By	1. Hard hats and high visibility clothing for personnel in work area. 2. Control work area (use flaggers, signage, barricades, and/or other means) and restrict non-essential personnel from the area. 3. Inspect rig and ensure that the equipment, augers, rods and tools will be properly secured during transport.	**M**
	2. Tip Over	1. Do not permit rig to attempt to traverse severely sloping terrain. 2. Use a ground guide along with a functioning back-up alarm during equipment backing. 3. Once rig is sited, deploy outriggers to properly block and level the rig and secure parking brake.	**M**
	3. Intermittent high noise levels	1. Site personnel are to wear hearing protection if noise levels are such that they must raise their voice in order to communicate with someone who is within arm's reach (approx. 2') of them. 2. SSO is responsible for determining and designating when hearing protection is required. 3. Hearing protection is to consist of either ear muffs or plugs that have a noise reduction rating (NRR) of at least 25 dB.	**M**
	4. Slips, Trips, Falls	1. Clear trees, roots, weeds, limbs and other ground hazards from the drill location. 2. Practice good housekeeping to keep the ground around the drill site clear of obstructions, equipment and other tripping hazards. 3. Wear appropriate foot protection to prevent slips and trips. Use caution when	**M**

ACTIVITY HAZARD ANALYSIS
Monitoring Well Installation using HSA and DPT methods
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JOB STEPS	HAZARDS	CONTROLS	RAC
		working on uneven and wet ground surfaces.	
	5. Minor cuts, or abrasions	1. When handling equipment and tools wear cut-resistant gloves when handling items with sharp or rough edges.	**M**
	6. Hand and power tool malfunction	1. Workers shall be knowledgeable of hand and power tools prior to use. 2. Workers shall inspect, test, and determine safe operating condition of hand and power tools. 3. Continued, periodic inspections shall be performed assure safe operating condition and proper maintenance. 4. Power tools designed to accommodate guards shall be equipped with such guards and must be functional. 5. Throwing tools from one location to another is prohibited.	
	7. Heavy lifting (muscle strains and pulls)	1. Practice safe lifting techniques (use mechanical lifting devices such as a dolly whenever possible. 2. Ensure clear path of travel, good grasp on object, perform "test lift" to gauge ability to safely make the lift 3. Lift with legs, obtain help to lift large, bulky, or heavy items.	**L**
	8. Insect bites	1. Shake out boots before donning. 2. Use insect repellants (products containing DEET should be applied to exposed skin, products containing Permethrin should be applied to clothing only. Follow manufacturer's recommendations for application). 3. Tape up pants leg to work boot joints with duct tape. 4. Wear light-colored clothing to better see and remove any insects. 5. Perform close body inspections at least daily upon leaving the site.	**L**
	9. Inclement weather	1. The FOL and/or the SSO will temporarily suspend outside activities in the event of electrical storms or high winds. 2. It is preferred that supported systems such as lightning detection devices or emergency weather broadcasts are employed. 3. However, when this is not possible field personnel should use the 30/30 Rule: *"If there is less than 30 seconds between thunder and lightning go inside and stay inside for at least 30 minutes after the last thunder."*	**M**
HSA Drill/DPT Operations	1. Auger/Rod start up and operation	1. Auger/Rod will be engaged only when the work area is cleared and site personnel notified. 2. Site personnel will not approach a rotating auger/rod.	**M**

ACTIVITY HAZARD ANALYSIS
Monitoring Well Installation using HSA and DPT methods
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JOB STEPS	HAZARDS	CONTROLS	RAC
		3. Use a long handled flat head shovel when removing auger/rod cuttings. 4. Stay away from rotating equipment. 5. Prevent shovel from lodging into the augers/rods and kicking out. 6. Do not wear loose clothing when working with augers/rods.	
	2. Cleaning augers/rods	1. Augers/rods will be cleaned only when they are stopped and in neutral. 2. They will not be restarted until the worker has given a verbal “all clear” to the operator, and the operator has visually determined that the worker is clear of the auger/rod. 3. Only long-handled shovels will be used to remove cuttings from the auger/rod.	**M**
	3. Exposure to contaminants of concern (metals, SVOCs, and VOCs)	1. Wear surgeons’ gloves when handling potentially-contaminated media and samples. 2. Avoid contact with potentially-contaminated media to the extent possible. 3. Follow good decontamination and practice good personal hygiene (hands and face washing) when exiting work area. 4. Hand-to-mouth activities in the work area will be prohibited (eating, drinking, smoking, etc.). 5. Exposure via dermal contact and ingestion represent some limited concern during this task.	**L**
Handling drill rods and augers	1. Struck by/entanglement	1. Be prepared for sudden shifting when removing rod sections. 2. Restrict non-essential personnel from approaching working area.	**L**
	2. Overhead hazards	1. All personnel within the radius of the Drill/DPT rig must wear ANSI approved hard hats.	**L**
	3. Slips, Trips, Falls	1. Clear trees, roots, weeds, limbs and other ground hazards from the location. 2. Practice good housekeeping to keep the ground around the site clear of obstructions, equipment and other tripping hazards. 3. Wear appropriate foot protection to prevent slips and trips. 4. Use caution when working on uneven and wet ground surfaces. 5. Keep a wide base and assure secure footing while attempting to handler auger flights and tooling.	**L**
	4. Contusions, cuts, or abrasions	1. When handling auger flights and tools, wear cut-resistant heavy cotton or leather work gloves when handling items with sharp or rough edges.	**M**

ACTIVITY HAZARD ANALYSIS
Monitoring Well Installation using HSA and DPT methods
Page 4 of 4

JOB STEPS	HAZARDS	CONTROLS	RAC
	5. Heavy lifting (muscle strains and pulls).	1. Practice safe lifting techniques by using mechanical lifting devices such as a dolly whenever possible. 2. Ensure clear path of travel 3. Have a good grasp on object. 4. Perform "test lift" to gauge ability to safely make the lift. 5. Lift with legs not back. Obtain help when needed to lift large, bulky, or heavy items	**M**

EQUIPMENT TO BE USED	TRAINING REQUIREMENTS	INSPECTION REQUIREMENTS
HSA and DPT Rigs, bore rods, auger flights, sharp knives, hand tools (dollies, hand carts, etc.), ventilation fan **Safety Equipment:** • A 20-pound dry chemical ABC fire extinguisher readily available. • Spill-control kit available at drilling location. • First-aid kit, eyewash, and an emergency air horn nearby. • Portable eye wash bottle **Monitoring Instruments:** None	1. Review of AHA during pre-task tailgate safety briefing with the intended task participants. 2. Personnel must be trained in use of drilling equipment. 3. The drill operator must have current certifications to operate the equipment. 4. Review operating manuals of monitoring instruments.	Visual inspection prior to use by user.
Personal Protective Equipment: <u>Minimum</u>: Safety toe boots, high-visibility clothing, safety glasses, work gloves. **<u>Optional items:</u>** Hardhat, hearing protection. nitrile surgeon's style gloves and Tyvek if there is a chance to soil clothing. **<u>HTRW</u>**: metals, SVOCs, and some VOCs	Initial PPE inspection performed by SSO. Ongoing (prior to each use) inspections responsibilities of PPE users.	PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees' 40 hour HAZWOPER training, which is to be verified by the SSO through initial training documentation and review prior to permitting personnel to participate in any onsite activities, and will be confirmed by visual observations of worker activities.

ACTIVITY HAZARD ANALYSIS
Monitoring Well Installation using HSA and DPT methods
Page 5 of 4

I have read and understand this AHA:

Name (Printed)	Signature	Date

FIGURE A-2-1 (Continued)
Activity Hazard Analysis (AHA)

Activity/Work Task: Groundwater sampling and monitoring well development.	Overall Risk Assessment Code (RAC) (Use highest code)	**M**
Project Location: NAVSTA Mayport, Florida	**Risk Assessment Code (RAC) Matrix**	
Contract Number: CTO JM71	**Severity** / **Probability**	
Date Prepared: May 1, 2012		
Prepared by: J. Laffey		
Reviewed by: J. Carothers, PhD		
Notes: (Field Notes, Review Comments, etc.)		

Severity	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Step 1: Review each **"Hazard"** with identified safety "Controls" and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and Identified as: Frequent, Likely, Occasional, Seldom, or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

- **E= Extremely High Risk**
- **H= High Risk**
- **M= Moderate Risk**
- **L= Low Risk**

JOB STEPS	HAZARDS	CONTROLS	RAC
Groundwater site access and set up	1. Minor cuts abrasions handling equipment and tools	1. Wear cut-resistant gloves when handling items with sharp or rough edges.	**L**
	2. Slips, Trips, Falls	1. Clear intended work areas and walking paths of roots, weeds, limbs and other ground hazards. 2. Practice good housekeeping to keep the site clear of obstructions, materials, equipment and other tripping hazards. 3. Ensure that work boots have adequately-aggressive sole design. 4. Use caution when working on uneven and wet ground.	**M**
	3. Insect bites, snake bites, and contact with poisonous plants.	1. Shake out boots before donning. 2. Use insect repellants. Products containing DEET should be applied to exposed skin. Products containing Permethrin should be applied to clothing only. Follow manufacturer's recommendations. 3. Tape up pants leg to work boot joints with duct tape and wear light-colored clothing to better see and remove any insects. 4. Avoid potential nesting areas (brush, deadfall, etc.) where insects or snakes may be present. Perform close body inspections at least daily upon leaving the site.	**M**
Taking samples using a small battery-operated pump and placing into sample containers	1. Exposure to contaminants of concern	1. Wear surgeon's style gloves when handling potentially-contaminated media and samples. 2. Avoid contact with potentially-contaminated media to the extent possible.	**L**

ACTIVITY HAZARD ANALYSIS
Groundwater and Monitoring Well Development
Page 2 of 3

JOB STEPS	HAZARDS	CONTROLS	RAC
		3. Follow good decontamination and practice good personal hygiene (hands and face washing) when exiting work area. 4. Hand-to-mouth activities in the work area will be prohibited (eating, drinking, smoking, etc.). 5. Exposure via dermal contact and ingestion represent some limited concern during this task.	
Packaging samples for shipment	1. Breakage of glass containers (if used) can cause cuts to hands or glass splinters in eye.	1. Handle glass containers carefully, wrap in protective bubble wrap at time of collection. 2. Wear safety glasses when handling glass containers.	
	1. Back injury when lifting heavy shipping coolers.	1. Use a dolly or get assistance when carrying loaded coolers, which can weigh up to 40+ pounds.	

Equipment To Be Used	Training Requirements	Inspection Requirements
Peristaltic pump, tubing, sample collection tools and containers **Safety Equipment:** Portable eye wash bottle **Monitoring Instruments:** None	Training/experience in proper sample collection, handling and chain of custody requirements.	Visual inspection prior to use by user.
Personal Protective Equipment: **Minimum**: nitrile surgeon's type gloves, safety toe boots, safety glasses **Optional items**: Hardhat, hearing protection. If sampling done concurrently with HSA, observe HSA AHA PPE as well. If contact with contaminants is likely, wear chemical-resistant coveralls (e.g., Tyvek) or aprons and surgeon's nitrile gloves under leather/cotton work gloves. **HTRW**: metals, SVOCs, and some VOCs	OSHA 40 Hazardous Waste Operations and Emergency Response (HAZWOPER) training, plus appropriate 8-hour annual refresher training for the task participants. Supervisors must have completed additional 8 hours of HAZWOPER training. ALSO: Review of AHA during pre-task tailgate safety briefing with the intended task participants. PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees' 40 hour HAZWOPER training, which is to be verified by the SSO through initial training documentation and review prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities.	Initial PPE inspection performed by SSO. Ongoing (prior to each use) inspections responsibilities of PPE users.

I have read and understand this AHA:

ACTIVITY HAZARD ANALYSIS
Groundwater and Monitoring Well Development
Page 3 of 3

Name (Printed)	Signature	Date

FIGURE A-2-1 (Continued)
Activity Hazard Analysis (AHA)

Activity/Work Task: Decontamination	Overall Risk Assessment Code (RAC) (Use highest code)					**M**
Project Location: NAVSTA Mayport, Florida	**Risk Assessment Code (RAC) Matrix**					
Contract Number: CTO JM71	**Severity**	**Probability**				
Date Prepared: May 1, 2012		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by: J. Laffey	Catastrophic	**E**	**E**	**H**	**H**	**M**
	Critical	**E**	**H**	**H**	**M**	**L**
Reviewed by: J. Carothers, PhD	Marginal	**H**	**M**	**M**	**L**	**L**
	Negligible	**M**	**L**	**L**	**L**	**L**
Notes: (Field Notes, Review Comments, etc.)	Step 1: Review each **"Hazard"** with identified safety "Controls" and determine RAC (See above)					
	"Probability" is the likelihood to cause an incident, near miss, or accident and Identified as: Frequent, Likely, Occasional, Seldom, or Unlikely.	**RAC Chart**				
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	**E= Extremely High Risk**				
		H= High Risk				
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.	**M= Moderate Risk**				
		L= Low Risk				

JOB STEPS	HAZARDS	CONTROLS	RAC
Personal Decontamination Equipment drop Segregated removal of PPE (wash and rinse reusable items, dispose of non-reusable items)	1. Slips, Trips, Falls	1. Clear intended decon area location of ground hazards. 2. Practice good housekeeping to keep the site clear of obstructions, materials, equipment and other tripping hazards. 3. Wear appropriate foot protection to prevent slips and trips. 4. Use caution when working on uneven and wet surfaces.	**L**
	2. Exposure to contaminated media	1. Follow good decontamination practices (work from top down and outside in). 2. Nitrile gloves are to be the last item of PPE removed. 3. Wash hands and face following personal decontamination and prior to performing any hand-to-mouth activity.	**L**
Decontamination of drilling equipment and large tooling (e.g., vehicles, etc.) using pressure washer	1. Noise	1. Pressure washer operator must wear hearing protection (muffs or plugs with NRR of at least 25 dB). 1. Restrict other personnel from decon pad during pressure washing operations.	**M**
	2. Flying projectiles	1. Pressure washer operator must exercise care when directing the wand so that it is not pointing at himself/herself or at any other worker. 2. Pressure washer operator must wear full face shield over safety glasses with side shields and brow protection. 3. At SSO discretion, additional PPE consisting of hardhat, rainsuit, apron, and or boot covers may be required during decon operations - depending on observations indicating that significant contact with decon	**L**

ACTIVITY HAZARD ANALYSIS
Decontamination
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JOB STEPS	HAZARDS	CONTROLS	RAC
		overspray and/or windy conditions during washing activities.	
	3. Falling objects	1. Place items to be decontaminated on ground or on washing/drying racks in a manner that they are secure and will not fall. 2. Wear safety toe safety footwear.	**L**
	4. Strains/sprains from heavy lifting	1. Practice safe lifting techniques (use mechanical lifting devices such as a dolly whenever possible, ensure clear path of travel, good grasp on object, perform "test lift" to gauge ability to safely make the lift, lift with legs not back, obtain help when needed to lift large, bulky, or heavy items).	**L**
	5. Slips/trips/falls	1. Keep decon areas orderly, maintain good housekeeping, spread light coating of sand on decon pad liner to increase traction.	**L**
	6. Exposure to contaminated media	1. Follow good decontamination practices (work from top down and outside in). Surgeon's gloves are to be the last item of PPE removed. 2. Wash hands and face following personal decontamination and prior to performing any hand-to-mouth activity.	**L**

Equipment To Be Used	Training Requirements	Inspection Requirements
Hand tools (hand brushes, garden sprayers, etc.) Pressure washer	None required. Review manufacturer's instructions and safety guidelines prior to use.	Visual inspection prior to use by user. Check wooden handles for cracks or splinters. Inspect pressure washer prior to putting into service to ensure that it is in good working order, and ensure that fittings are secure.
Personal Protective Equipment: **Minimum**: Safety toe boots, safety glasses **Optional items**: Hardhat, hearing protection. Decontamination	Initial site specific H&S training to cover review of the APP and SSHP. Daily tail-gate and pre-task briefings to review appropriate AHAs and other relevant topics. OSHA 40 HAZWOPER training, plus appropriate 8-hour annual refresher training for the task	Initial PPE inspection performed by SSO. Ongoing (prior to each use) inspections responsibilities of

ACTIVITY HAZARD ANALYSIS
Decontamination
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Equipment To Be Used	Training Requirements	Inspection Requirements
pad pressure washer operators are to wear full face shield over safety glasses with side shields and brow protection, hearing protection, and nitrile gloves. If contact with overspray cannot be avoided, rain suit or moisture-repellant disposable coveralls may be specified by the SSO. **HTRW**: see above	participants. Supervisors must have completed additional 8 hours of HAZWOPER training. Also Review of AHA during tailgate safety briefing with the intended task participants. PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees' 40 hour HAZWOPER training, which is to be verified by the SSO through initial training documentation and review prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities	PPE users.

I have read and understand this AHA:

Name (Printed)	Signature	Date

FIGURE A-2-1 (Continued)
Activity Hazard Analysis (AHA)

Activity/Work Task: IDW Management	Overall Risk Assessment Code (RAC) (Use highest code)	**L**
Project Location: NAVSTA Mayport, Florida	**Risk Assessment Code (RAC) Matrix**	
Contract Number: CTO JM71		
Date Prepared: May 1, 2012		
Prepared by: J. Laffey		
Reviewed by: J. Carothers, PhD		
Notes: (Field Notes, Review Comments, etc.)		

Severity	**Probability**				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	**E**	**E**	**H**	**H**	**M**
Critical	**E**	**H**	**H**	**M**	**L**
Marginal	**H**	**M**	**M**	**L**	**L**
Negligible	**M**	**L**	**L**	**L**	**L**

Step 1: Review each **"Hazard"** with identified safety "Controls" and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and Identified as: Frequent, Likely, Occasional, Seldom, or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

E= Extremely High Risk
H= High Risk
M= Moderate Risk

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

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

I have read and understand this AHA:

Name (Printed)	Signature	Date

3.0 TRAINING, GENERAL AND PROJECT-SPECIFIC

3.1 GENERAL

Tetra Tech personnel must complete 40 hours of introductory hazardous waste site training prior to performing work at NAVSTA Mayport. Tetra Tech personnel who have had introductory training more than 12 months prior to site work must have completed 8 hours of refresher training within the previous 12 months before being cleared for site work. In addition, 8-hour supervisory training in accordance with 29 CFR 1910.120(e)(4) will be required for site supervisory personnel. At least two personnel on site must be trained in Basic First Aid, CPR, and blood borne pathogen (BBP) control and response. Documentation of Tetra Tech introductory, supervisory, and refresher training as well as site-specific training will be maintained at the site. Copies of certificates or other official documentation will be used to fulfill this requirement.

3.2 SITE SPECIFIC

The Tetra Tech SSO will provide site-specific training to Tetra Tech employees who will perform work on this project. Attachment I will be used to document the provision and content of the project-specific and associated training. Site personnel will be required to sign this form prior to commencement of site activities.

This training documentation will identify personnel who through record review and attendance of the site-specific training are cleared for participation in site activities. This document shall be maintained at the site to identify and maintain an active list of trained and cleared site personnel.

The Tetra Tech SSO will also conduct a pre-activities training session prior to initiating site work. This session will cover the APP and SSHP and provide an opportunity for participants to ask questions.

The SSO will also hold a brief meeting (tailgate session) at the beginning of each day to discuss operations planned for that day, and a review of the appropriate AHAs with the planned task participants. A short meeting may also be held at the end of the day to discuss the operations completed and any problems encountered.

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

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

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

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

4.0 PERSONAL PROTECTIVE EQUIPMENT

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

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

The anticipated levels of protection selected for use by field personnel during site activities is Level D. If site conditions or the results of air monitoring performed during site activities warrant a higher level of protection, the field personnel will withdraw from the site, immediately notify the Tetra Tech PHSO, and obtain further instructions. PPE levels can be upgraded or downgraded based on a change in site conditions or investigation findings. When a significant change in site conditions occurs, hazards will be reassessed.

PPE has been selected based on the results of task-specific hazard assessments. Through the completion of employee training (e.g., introductory 40-hour hazardous waste training, annual refresher training, etc.), Tetra Tech employees have been informed of the proper selection, use, and care of PPE items provided to them. After PPE is provided to an employee, the responsibility for using and caring for it appropriately is the responsibility of that employee. The SSO is responsible for assuring that these responsibilities are fulfilled through daily observations and work area inspections at the sites. The SSO is also responsible for assuring that appropriate and adequate supplies of PPE are maintained such that they are readily available for issuance/replacement and in a clean and sanitary manner and location. The site personnel will use the procedures presented in the SSHP to obtain optimum performance from PPE.

The levels of personal protection to be used for work tasks have been selected based on the nature of the planned work activities and on the known or anticipated hazards. Specific selected for this project is listed, by task, in the AHAs located in Section 2.0 of the SSHP. The PPE minimum is as follows:

- Safety glasses with side shields
- Hard hat when near overhead hazards
- Long sleeve shirts and pants
- Safety toed shoes/boots
- Tyvek® coverall type suits if a chance of soiling clothing

5.0 MEDICAL SURVIELLANCE

Personnel performing onsite work that will result in exposure to contaminant-related health and safety hazards shall be enrolled in a medical surveillance program that complies with OSHA standards 29 CFR 1910.120(f) and 29 CFR 1926.65(f). Certification of medical surveillance program participation is appended to the SSHP. The certification shall include:

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

The required written certified occupational physician's opinion shall be made available upon request to the Navy COR. The medical records shall be maintained in accordance with 29 CFR 1910.1020. Attachment III of the APP contains the certification of participation in a medical surveillance program.

6.0 EXPOSURE MONITORING/AIR SAMPLING PROGRAM

The constituents in the soil and groundwater are non-volatile or are in insufficient quantity, based on recent sampling data, to exceed the OEL. As a result direct reading instruments will not be required to monitor worker exposures at the site. Should site conditions change to warrant air monitoring, as determined by the FOL and/or SSO, this SSHP will be modified accordingly and personnel will be trained on the need for and use of direct reading instrument(s).

7.0 TEMPERATURE EXTREMES

Because of the geographical location of the planned work, the seasonal weather conditions, and the physical exertion that can be anticipated with some of the planned tasks, it is necessary for the field team to be aware of the signs and symptoms and the measures appropriate to prevent heat and cold stress. While it is unlikely, if such conditions are encountered use the following information on heat and cold stress recognition, prevention and control.

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

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

7.1 HEAT RELATED DISORDERS

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

7.1.1 Heat Rash

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

Signs and Symptoms

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

7.1.2 Heat Cramps

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

Signs and Symptoms

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

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

7.1.3 Heat Exhaustion

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

Signs and Symptoms

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

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

7.1.4 Heat Stroke

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

Signs and Symptoms

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

7.1.5 Controlling Heat Stress

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

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

- Schedule tasks that are physically-demanding in early morning and late afternoon timeframes when heavy loads would be less of an issue.

- Notify the SSO who may perform biological monitoring to determine the extent of the heat related condition.

- The SSO may alter the work regime that will provide adequate rest periods for cooling down. This may require additional shifts of workers.

- The SSO may also recommend cooling devices such as vortex tubes or cooling vests be worn beneath protective garments.

- When conditions where heat related disorders may be experienced, the SSO through site-specific training and safety briefing will inform site personnel of the importance of adequate rest, acclimation, and proper diet in the prevention of heat stress.

- Provide adequate liquids to replace lost body fluids.

- Personnel must replace water and salt lost from sweating.

- Personnel must be encouraged to drink more than the amount required to satisfy thirst.

- Thirst satisfaction is not an accurate indicator of adequate salt and fluid replacement.

- Approximately 1 cup of cool water every 20 minutes is recommended.

- Replacement fluids can be commercial mixes such as Gatorade®.

- Move affected persons into a shaded cool rest area (below 77°F is best).

- Personnel shall remove impermeable protective garments during rest periods.

- Personnel shall not be assigned other tasks during rest periods.

One of the following biological monitoring procedures may be utilized by the SSO to monitor heat stress concerns:

- Heart rate (HR) shall be measured by the pulse for 30 seconds as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 110 beats/minute.

- If the HR is higher, the next work period should be shortened by 10 minutes (or 33%), while the length of rest period stays the same.

- If the pulse rate is 100 beats/minute at the beginning of the next rest period, the following work cycle should be shortened by 33%.

- The length of the initial work period will be determined by using Table A-7-1 below.

TABLE A-7-1

PERMISSIBLE HEAT EXPOSURE THRESHOLD LIMIT VALUES

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

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

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

7.1.6 Temperature Extremes – Heat Stress Indication

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

- Watch for signs of heat stress/exhaustion, see Table A-7-2
- Provide fluid replacement
- Provide adequate number of breaks within a cooler environment.

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

- Wear a hat that shades the face, neck, and ears.

- Apply sunscreen with a SPF of 15 or higher liberally on any exposed skin at least 15 minutes before going outside, then at least every two hours, more if you are sweating a lot.

- Plan/provide suitable equipment to offer shade to avoid the midday sun since the sun's ultraviolet rays are most intense between 10 A.M. and 4 P.M. and can damage your skin even on hazy days. Portable canopies over the sample station are an example of this.

- Wear wrap-around sunglasses to protect the eyes and delicate skin around them.

TABLE A-7-2

HEAT STRAIN SYMPTOMS

Stop Work If Any Worker Demonstrates Any Of The Following

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

Individuals May Be at Greater Risk of Heat Stress If:

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

7.1.7 Heat Stress Treatment and Field Management

7.1.7.1 First Aid for Heat Stroke

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

- Call NAVSTA Mayport Emergency Dispatch Center and notify FOL/SSO.
- Move the affected individual to a cool shaded area.
- Cool the worker using methods such as:
  - Soaking their clothes with water.
  - Spraying, sponging, or showering them with water.
  - Fanning their body.

7.1.7.2 First Aid for Heat Exhaustion

Treat victim suffering from heat exhaustion with the following:

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

7.1.7.3 First Aid for Heat Cramps

Individuals with heat cramps should:

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

7.1.7.4 First Aid for Heat Rash

Workers experiencing heat rash should:

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

7.2 COLD STRESS RELATED DISORDERS

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

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

Fatal exposures to cold among workers have almost always resulted from accidental exposures involving failure to escape from low environmental air temperatures or from immersion in low temperature water. The single most important aspect of life-threatening hypothermia is the fall in the deep core temperature of the body. The clinical presentations of victims of hypothermia are shown in Table A-7-3. Workers should be protected from exposure to cold so that the deep core temperature does not fall below 36°C (96.8°F); lower body temperatures will very likely result in reduced mental alertness, reduction in rational decision making, or loss of consciousness with the threat of fatal consequences.

7.2.1 Signs and Symptoms

Pain in the extremities may be the first early warning of danger to cold stress.

During exposure to cold, maximum severe shivering occurs when the body temperature has fallen to 35°C (95°F). This must be taken as a sign of danger and exposure to cold should be immediately terminated when severe shivering becomes evident. Useful physical or mental work is limited when severe shivering occurs.

TABLE A-7-3
PROGRESSIVE CLINICAL PRESENTATIONS OF HYPOTHERMIA*

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

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

7.2.2 Control Measures

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

Adequate insulating dry clothing to maintain core temperatures above 36°C (96.8°F) must be provided to workers if work is performed in air temperatures below 4°C (40°F). Wind chill cooling rate and the cooling power of air are critical factors. [Wind chill cooling rate is defined as heat loss from a body expressed in watts per meter squared which is a function of the air temperature and wind velocity upon the exposed body.] The higher the wind speed and the lower the temperature in the work area, the greater the insulation value of the protective clothing required. An equivalent chill temperature chart relating the actual dry bulb air temperature and the wind velocity is presented in Table A-7-4. The equivalent chill temperature should be used when estimating the combined cooling effect of wind and low air temperatures on exposed skin or when determining clothing insulation requirements to maintain the deep body core temperature.

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

- Acclimatization
  - With exposure the body does undergo changes that will permit it to adjust to the cold weather better.
- Dehydration
  - Water and salt loss magnifies conditions associated with hypothermia.
  - Warm, sweet nonalcoholic fluids should be employed for fluid replacement.
  - Soup, non-caffeinated drinks including decaffeinated teas, coffees, etc. are suitable for this purpose.
- Diet
  - A balanced diet can provide the body with the necessary nutrients to aid in combating cold stress.
  - Restrictive diets avoiding salts, carbohydrates, etc. may rob you of certain elements that you need.
  - It should however be noted that the avoidance of caffeine and alcoholic drinks may increase the effects of a cold environment through the loss of water and salts.

TABLE A-7-4

COOLING POWER OF WIND ON EXPOSED FLESH EXPRESSED AS EQUIVALENT TEMPERATURE (under calm conditions)*

Estimated Wind Speed (in mph)	Actual Temperature Reading (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Temperature (°F)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148

(Wind speeds greater than 40 mph have little additional effect)	**LITTLE DANGER** In < hr with dry skin. Maximum danger of false sense of security	**INCREASING DANGER** Danger from freezing of exposed flesh within one minute.	**GREAT DANGER** Flesh may freeze within 30 seconds.
	Trenchfoot and immersion foot may occur at any point on this chart.		

- Engineering Controls such as wind shields/barriers may be used to control the potential effects of cold stress.

- Administrative controls such as worker rotation; work/warm regimens; required fluid intake; scheduling the work for warmer weather; assigning more workers to the task to complete it quicker.

- Overall physical condition should always be considered when combating cold stress. Older persons, those on certain medications (blood pressure control) are vulnerable to cold environment and cold stress disorders.

- Environmental monitoring results will tell you if the conditions are such that cold related disorders can occur. Biological monitoring will provide real time information as to the progression of the cold related disorders within your field crew.

7.2.3 Monitoring

- Core temperature
  - Ensure that it does not drop below 96.8ºF

- Weight Loss
  - Monitoring weight loss may be indicative of water and salt loss through dehydration.
  - >2% changes in body weight are indicative of water loss.

- Visual observation of signs and symptoms of overexposure.

7.2.4 Special Conditions - Evaluation and Control

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

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

TLVs recommended for properly clothed workers for periods of work at temperatures below freezing are shown in Table A-7-5.

TABLE A-7-5

THRESHOLD LIMIT VALUES WORK/WARM-UP SCHEDULE FOR FOUR-HOUR SHIFT*

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

NOTES:

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

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

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

- If fine work is to be performed with bare hands for more than 10-20 minutes in an environment below 16°C (60.8°F), special provisions should be established for keeping the workers' hands warm.

- For this purpose, warm air jets, radiant heaters (fuel burner or electric radiator), or contact warm plates may be utilized.

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

- If the air temperature falls below 16°C (60.8°F) for sedentary, 4°C (39.2°F) for light, -7°C (19.4°F) for moderate work and fine manual dexterity is not required, then gloves should be used by the workers.

To prevent contact frostbite, the workers should wear anti-contact gloves.

- When cold surfaces below -7°C (19.4°F) are within reach, a warning should be given to each worker by the supervisor to prevent inadvertent contact by bare skin.

- If the air temperature is -17.5°C (0°F) or less, the hands should be protected by mittens.

- Machine controls and tools for use in cold conditions should be designed so that they can be handled without removing the mittens.

Provisions for additional total body protection are required if work is performed in an environment at or below 4°C (39.2°F). The workers should wear cold protective clothing appropriate for the level of cold and physical activity:

- If the air velocity at the job site is increased by wind, draft, or artificial ventilating equipment, the cooling effect of the wind should be reduced by shielding the work area or by wearing an easily removable windbreak garment.

- If only light work is involved and if the clothing on the worker may become wet on the job site, the outer layer of the clothing in use may be of a type impermeable to water.

- With more severe work under such conditions, the outer layer should be water repellent, and the outerwear should be changed as it becomes wetted.

- The outer garments should include provisions for easy ventilation in order to prevent wetting of inner layers of sweat.

- If work is done at normal temperatures or in a hot environment before entering the cold area, the employee should make sure that clothing is not wet as a consequence of sweating.

- If clothing is wet, the employee should change into dry clothes before entering the cold area.

- The workers should change socks and any removable felt insoles at regular daily intervals or use vapor barrier boots.

- The optimal frequency of change should be determined empirically and will vary individually and according to the type of shoe worn and how much the individual's feet sweat.

- If exposed areas of the body cannot be protected sufficiently to prevent sensation of excessive cold or frostbite, protective items should be supplied in auxiliary heated versions.

If the available clothing does not give adequate protection to prevent hypothermia or frostbite, work should be modified or suspended until adequate clothing is made available or until weather conditions improve.

7.2.5 Work - Warming Regimen

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

sweet drinks and soups should be provided at the work site to provide caloric intake and fluid volume. The intake of coffee should be limited because of the diuretic and circulatory effects.

For work practices at or below -12°C (10.4°F) ECT, the following should apply:

- The worker should be under constant protective observation (buddy system or supervision).
- The work rate should not be so high as to cause heavy sweating that will result in wet clothing; if heavy work must be done, rest periods should be taken in heated shelters and opportunity for changing into dry clothing should be provided.
- New employees should not be required to work full time in the cold during the first days of employment until they become accustomed to the working conditions and required protective clothing.
- The weight and bulkiness of clothing should be included in estimating the required work performance and weights to be lifted by the worker.
- The work should be arranged in such a way that sitting still or standing still for long periods is minimized.
- Unprotected metal chair seats should not be used.
- The worker should be protected from drafts to the greatest extent possible.
- The workers should be instructed in safety and health procedures.
- The training program should include as a minimum instruction in:
  - Proper rewarming procedures and appropriate first aid treatment.
  - Proper clothing practices.
  - Proper eating and drinking habits.
  - Recognition of impending frostbite.
  - Recognition of signs and symptoms of impending hypothermia or excessive cooling of the body even when shivering does not occur.
  - Safe work practices.

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

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

8.0 STANDARD OPERATING PROCEDURES, ENGINEERING CONTROLS, AND WORK PRACTICES

In addition to the task-specific work practices and restrictions identified in the AHAs found in Section 2.0 of the SSHP, the following general safe work practices are to be followed when conducting work on-site.

8.1 SITE RULES/PROHIBITIONS

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

- Minimize the number of personnel and equipment in contaminated areas (such as the exclusion zone). Non-essential vehicles and equipment should remain within the support zone.

- Establish appropriate decontamination procedures for leaving the site.

- Immediately report injuries, illnesses, and unsafe conditions, practices, and equipment to the SSO.

- Observe co-workers for signs of toxic exposure and heat or cold stress.

- Inform co-workers of potential symptoms of illness, such as headaches, dizziness, nausea, or blurred vision.

8.2 MATERIAL HANDLING PROCEDURES

Handling and storing materials involve many operations including handling drums and moving equipment. Improper handling and storing of materials often result in injuries. Whether moving materials manually or mechanically, know and understand the potential hazards associated with the task at hand and how to control the workplace to minimize danger.

Hazards include lifting heavy objects, falling objects, improperly stacked materials, and various types of equipment. Potential injuries that can occur when manually moving materials include the following:

- Strains and sprains from lifting loads improperly or from carrying loads that are either too large or too heavy.

- Fractures and bruises caused by being struck by materials or by being caught in pinch points.

- Cuts and bruises caused by falling materials that have been improperly stored or by incorrectly cutting ties or other securing devices.

- Manual lifting is likely to occur during many phases of the project.

- Personnel conducting assigned tasks where manual lifting is required should use the following safe lifting procedures to help reduce the potential for personal injury.

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

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

8.2.1 Spill Contingency

It is anticipated that quantities of bulk potentially hazardous materials (greater than 55-gallons) will <u>not</u> be handled during the site activities. It is possible, however, that as the job progresses disposable PPE and other non-reusable items may be generated. As needed, 55-gallon drums will be used to contain unwanted items generated during sampling activities. The drum(s) will be labeled with the site name and address, the type of contents, and the date the container was filled as well as an identified contact person. As warranted, samples will be collected and analyzed to characterize the material and determine appropriate disposal measures, as described in the Project-Specific SAP. Once characterized the drum(s) will be removed from the staging area and disposed of in accordance with Federal, State and local regulations.

8.2.2 Potential Spill Areas

Should drums contain liquid wastes, potential spill areas will be monitored in an ongoing attempt to prevent and control further potential contamination of the environment. Areas designated for handling, loading, and unloading of potentially contaminated waters and debris present limited potential for leaks or spills. Liquid waste is not anticipated outside of expected decontamination materials.

8.2.3 Leak and Spill Detection

To establish an early detection of potential spills or leaks, periodic inspections by the SSO will be conducted during working hours to visually determine that containers are not leaking. If a leak is

detected, the first approach will be to transfer the container contents using a hand pump into a new container. Other provisions for the transfer of container contents will be made and appropriate emergency contacts will be notified, if necessary. In most instances, leaks will be collected and contained using absorbents such as Oil-dry, vermiculite, and/or sand, which may be stored at the staging area in a conspicuously marked drum. This material too, will be containerized for disposal pending analyses. Inspections will be documented in the Project Logbook.

8.2.4 Personnel Training and Spill Prevention

Personnel will be instructed on the procedures for spill prevention, containment, and collection of hazardous materials in the site-specific training. The FOL and/or the SSO will serve as the Spill Response Coordinator for this operation should the need arise.

8.2.5 Spill Control Plan

This section describes the procedures the Tetra Tech field crewmembers will employ upon the detection of a spill or leak.

- Notify the FOL/SSO immediately.
- The FOL/SSO will notify NLR-CBD POC immediately.
- Take immediate actions to stop the leak or to control the spill.
- Avoid contacting container contents.
- Spread the absorbent material in the area of the spill covering completely.

It is not anticipated that a spill will occur in which the field crews cannot handle. Should this occur; however, the FOL/SSO will notify appropriate emergency response agencies.

The following represents the types of equipment that may be maintained at the staging area for the purpose of supporting this Spill Containment Program (depending on the likelihood that drums and/or liquid wastes are generated).

- Sand, clean fill, vermiculite, or other noncombustible absorbent (oil-dry)
- Drums (55-gallon U.S. DOT 1A1 and/or 1A2)
- Shovels, rakes, and brooms
- Labels

8.3 DRUM/CONTAINER/TANK HANDLING

During the execution of the contract, various types and quantities of generated waste materials will be generated and may include, but not be limited to, PPE excess soil, and limited quantities of decontamination fluids. Personnel are permitted to handle and/or sample drums containing known waste sources/materials, but handling or sampling of other drums (unknowns) requires an APP/HSP revision or amendment approved by the Tetra Tech HSM. The following control measures must be taken when managing drums containing waste sources/materials:

- Minimize transportation of drums or other containers with generated waste materials. However, where this is deemed necessary appropriate drum dollies, hand trucks or other suitable material handling equipment shall be used to transfer drums of generated waste materials.

- Sample or open only labeled drums or drums known to contain generated waste materials.

- Unknown drums or drums that show evidence of excessive buckling/ bulging, corrosion, vapors, crystallization, unusual discoloration or other abnormalities may only be sampled with
    - Evaluation of engineering controls,
    - Proper PPE air monitoring equipment and
    - Use of properly trained personnel familiar with the sampling of unknown drum contents.

- Use caution when sampling bulging or swollen drums.
    - Relieve pressure slowly and step away from the drum as pressure is being released.

- If drums contain, or potentially contain, flammable materials, use non-sparking (i.e., brass) tools to open the drum.
    - Picks, chisels, and firearms may not be used to open drums.

- Reseal bung holes or plugs whenever possible.

- Avoid mixing incompatible drum contents.

- Sample drums without leaning over the drum opening.

- Transfer the content of drums using a method that minimizes contact with material.

- PPE worn to minimize potential dermal to identified contaminants of concern.

- Good personal hygiene practices and procedures must be maintained.

9.0 SITE CONTROL MEASURES

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

9.1 CONTROL ZONES

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

9.1.1 Exclusion Zone

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

- Drilling – The height of the mast plus 10 feet, or 35 feet whichever is most conservative.
- Groundwater sampling – 10 feet from point of sampling
- High Pressure washing and heavy equipment decontamination operations – 35 feet
- Low pressure decontamination activities – 10 feet
- IDW Storage area – 10 feet

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

9.1.2 Contamination Reduction Zone

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

9.1.3 Support Zone

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

9.2 SITE VISITORS

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

- Personnel invited to observe or participate in operations by Tetra Tech
- Regulatory personnel (i.e., DoD, Environmental Protection Agency [EPA], OSHA)
- Authorized Navy Personnel
- Other authorized visitors

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

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

9.3 SITE SECURITY

Site security will be maintained using Tetra Tech field personnel. Tetra Tech will retain complete control over active operational areas. As this activity takes place at an Navy facility the first line of security will take place at the base entrance gates restricting the general public. The second line of security will take place at the work site referring interested parties to the Base Contact. The Base Contact will serve as a focal point for base personnel, interested parties, and serve as the final line of security and the primary enforcement contact.

9.4 MATERIAL SAFETY DATA SHEET (MSDS) REQUIREMENTS

Tetra Tech and subcontractor personnel will provide MSDSs for chemicals brought on site. The contents of these documents will be reviewed by the SSO with the user(s) of the chemical substances prior to any actual use or application of the substances on site. A chemical inventory of the chemicals used on site will be developed using the HSGM. The MSDSs will then be maintained in a central location (i.e., temporary office) and will be available for anyone to review upon request.

9.5 COMMUNICATION

As personnel will be working in proximity to one another during field activities, a supported means of communication between field crew members will not be necessary.

External communication will be accomplished by using cell phones. Workers should enter the emergency and important phone numbers from Table A-13-1 into their cell phones prior to beginning work.

9.6 CONFINED SPACE ENTRY

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

9.7 DRILL/INCIDENT AFTER-ACTION CRITIQUE

The FOL will conduct a drill or exercise to test the Emergency Action Plan. A critique with the site personnel after each drill or incident will be conducted. This critique provides a mechanism to review the incidents and exercises or drills to determine where improvements can be made. For incidents recorded in TOTAL, the FOL will utilize the Lessons Learned component for the critique.

10.0 PERSONAL HYGIENE AND DECONTAMINATION

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

10.1 RESPONSIBILITIES

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

10.2 DECONTAMINATION

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

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

This decontamination procedure will consist of:

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

The FOL/SSO will determine the organization and materials used. Factors that are considered include: (1) the extent and type of hazard expected, (2) meteorological conditions, (4) topography, (5) levels of protection selected, and (6) availability of equipment and supplies.

10.3 CONTAMINATION AVOIDANCE

Avoiding contamination is the first and best method for preventing the transfer of contamination to personnel or to uncontaminated areas. Each person involved in site operations must regularly practice the methods, listed below, for contamination reduction.

- Know the limitations of the protective equipment being used.
- Do not sit or lean against anything in a contaminated area.
- Waste containers should be checked for incompatible materials.
- Do not set sampling equipment directly on contaminated areas.
- Use the proper tools to safely conduct the job.

10.4 DECONTAMINATION GUIDANCE

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

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

10.5 CLOSURE OF THE DECONTAMINATION LINE

When the decontamination line is no longer needed, it will be closed down by site personnel. The disposable items used and generated during the operation will be double-bagged and contained on site, or removed to an approved off-site disposal facility. Decontamination and rinse solutions may be discarded on site if approved by regulatory agencies. If not, they will be removed to an approved disposal facility. Reusable rubber clothing should be dried and prepared for future use. If gross contamination had occurred, additional decontamination or disposal of these items may be required. Cloth items must be bagged and removed from the site for final cleaning or disposal. Wash tubs, pails, containers, etc., must be thoroughly washed, rinsed, and dried before removal from the site.

Decontamination fluids will be stored in a location designated by CBD-NRL and left at the facility pending completion of analytical results prior to disposal off-site.

11.0 EQUIPMENT DECONTAMINATION

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

The equipment decontamination will take place at a centralized decontamination pad utilizing steam or pressure washers. Heavy equipment such as drill rigs, will have the wheels and tires cleaned along with any loose debris removed, prior to transporting to the central decontamination area. The site vehicles will be restricted access to exclusion zones, or also have their wheels/tires sprayed off as not to track mud onto the roadways servicing this installation. Roadways shall be cleared of any debris resulting from the onsite activity.

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

The FOL or the SSO will be responsible for evaluating equipment arriving on site and that which is to leave the site. No equipment will be authorized access or exit without this authorization.

Evaluation will consist of:

- Visual inspection
- Scanning equipment with monitoring instruments

12.0 EMERGENCY EQUIPMENT AND FIRST AID

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

- A first-aid kit that is labeled meeting the ANSI Z308.1 guidelines.

- Eye wash units (or bottles of disposable eyewash solution) are maintained during sampling activities due to the small quantities of corrosive preservatives and well construction activities due to the caustic nature of the cement/grout products.
  - These units are acceptable due to extremely small quantity of the corrosives (two drops per sample bottle).
  - Site workers wear protective eyewear during these tasks.
  - These will be used as adjunct support until access to a fixed unit.
  - These units will be maintained in a clean location and inspected each week.

- Fire extinguishers will be maintained onsite and shall be immediately available for use in the event of an emergency. 2A:10BC for general support activities.

- If fuel will be transferred from portable fuel cans they will be UL approved safety cans properly labeled. If greater than 25 gallons is stored onsite a 5A:60BC fire extinguisher will be mounted 50-feet from the fueling location.

- Fire extinguishers will be inspected monthly to ensure:
  - Sufficient charge
  - No physical damage
  - Tamper indicators are in place
  - Inspection tag documents inspection

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

- Spill Pads – As the drilling equipment operates based on combustion engine driven hydraulic system, spill pads will be maintained at the operational area in order to support immediate response to a hydraulic line rupture.

12.1 FIRST AID

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

Basic First-Aid is considered treatment that can be rendered by a trained first aid provider at the injury location. Such care might include the management of severe bleeding, broken bones, asphyxiation, or heat related injuries.

Medical attention above First-Aid level support will require assistance from the designated emergency response agencies.

Any pertinent information regarding allergies to medications or other special conditions will be provided to medical services personnel. This information is listed on Medical Data Sheets which will be filed onsite. See Attachment II.

13.0 EMERGENCY ACTION PLAN AND CONTINGENCY PROCEDURES

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

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

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

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

13.1 EMERGENCY PLANNING

Based on the nature of the planned activities, emergencies resulting primarily from physical hazards (contact with moving machinery, etc.) could be encountered. To minimize or eliminate the potential for these emergency situations, pre-emergency planning activities will include the following (which are the responsibility of the SSO and/or the FOL):

- Coordinating with the local Emergency Response personnel prior to the commencement of work to ensure that Tetra Tech emergency action activities are compatible with existing emergency response procedures.

- Establishing and maintaining information at the project staging area (support zone) for easy access in the event of an emergency.

- Creating and maintaining documents onsite that can be important in the event of an emergency situation, including:

  - A Chemical Inventory of hazardous chemicals onsite
  - Corresponding Material Safety Data Sheets.
  - Completed Medical Data Sheets (Attachment II) for onsite personnel.
  - A log book identifying personnel onsite each day.
  - Hospital route maps with directions.
  - Emergency Notification - phone numbers.

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

- Determining that an emergency situation exists, initiating a site evacuation, accounting for onsite personnel at the assembly area, and determining if/when return to work conditions resume

- With assistance from the SSO, educating site workers to the hazards and control measures associated with planned activities at the site, and providing early recognition and prevention.

- With assistance from the SSO, periodically performing practice drills to ensure site workers are familiar with incidental response measures.

13.2 PERSONNEL AND LINES OF AUTHORITY FOR EMERGENCY SITUATIONS

In the event of an emergency, personnel will evacuate and the NAVSTA Mayport Emergency Dispatch Center will be notified. It has been determined that the majority of potential emergency situations would be better supported by NAVSTA Mayport emergency responders. Based on this determination, Tetra Tech will not provide emergency response support beyond their on-site capabilities and their training. The emergency response agencies listed in this plan are capable of providing the most effective response, and as such, will be designated as the primary responders. These agencies are located within a reasonable distance from the area of site operations, which ensures adequate emergency response time. The NAVSTA Mayport POC will be notified anytime emergency response agencies are contacted.

13.3 CRITERIA AND PROCEDURES FOR EMERGENCY RECOGNITION AND SITE EVACUATION

Emergency situations may be encountered during site activities.

13.3.1 Emergency Recognition

Emergency situations that may be encountered during site activities will normally be recognized by visual observation. Emergencies involving physical hazards are generally readily apparent visually. Visual observation will also play a role in detecting potential exposure events to chemical hazards. To adequately recognize chemical exposures, site personnel must have an awareness of signs and symptoms of exposure associated with the principle site contaminant of concern. Tasks to be performed at the site, potential hazards associated with those tasks and the recommended control methods are discussed in this SSHP and APP. Additionally, early recognition of hazards will be supported by daily site surveys to eliminate any situation predisposed to an emergency. The FOL and/or the SSO will be responsible for performing surveys of work areas prior to initiating site operations and periodically while operations are being conducted. Survey findings are documented by the FOL and/or the SSO in the Site Health and Safety logbook. Site personnel are responsible for reporting perceived hazardous situations.

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

13.3.2 Site Evacuation

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

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

document the names of personnel onsite (on a daily basis) in the site Health and Safety Logbook. This information will be utilized to perform the head count in the event of an emergency.

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

13.3.3 Emergency Alarm Systems

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

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

HELP	three short blasts	(. . .)
EVACUATION	three long blasts	(- - -)

- Report to the designated refuge point.

- Once non-essential personnel are evacuated, appropriate response procedures will be enacted to control the situation.

- Describe to the FOL (FOL will serve as the Incident Coordinator) pertinent incident details.

13.4 DECONTAMINATION AND MEDICAL TREATMENT OF INJURED PERSONNEL

Based on the nature of the planned activities and on the nature and extent of contamination that may be encountered during these activities, the need for any specific personal decontamination activities in an

emergency medical situation is highly unlikely. In the unlikely instance that such efforts become necessary, decontamination procedures will be performed only if doing so does not further jeopardize the welfare of the involved personnel. Decontamination will be postponed if the incident warrants immediate evacuation. As soon as possible and prior to transportation to a medical center the contaminated site worker will be:

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

13.5 ROUTE MAPS AND PHONE NUMBERS FOR EMERGENCY RESPONDERS

Prior to initiating field activities, personnel will be thoroughly briefed on the emergency procedures to be followed in the event of an accident. All emergencies will be reported to the station's Emergency Services Dispatch Center. Table A-13-1 provides a list of emergency contacts and telephone numbers. This table must be posted where it is readily available to site personnel.

Emergency Room services are not available at the Branch Medical Clinic Mayport. Emergencies should be reported to 911 or the patient taken to the nearest emergency room located at the Baptist Medical Center Beaches.

TABLE A-13-1
EMERGENCY CONTACTS
NAVSTA MAYPORT

AGENCY	TELEPHONE
NAVSTA Mayport - Emergency Dispatch	(904) 270-5583 or (904) 270-5584
NAVSTA Mayport Security	(904) 270-5583 or (904) 270-5584
Baptist Medical Center Beaches	(904) 627-2900
NAVSTA Mayport Safety Department (Building 1363)	(904) 270-5218
Navy RPM, Brian Syme	(904) 542-6151
NAVSTA Mayport POC, Paul Malewicki	(904) 270-3188
NAVSTA Mayport Public Works Office	(904) 270-5580
NAVSTA Mayport Duty Officer	(904) 270-5401
Sunshine State Utility One-Call of Florida	811
Poison Control Center	(800) 222-1222
Chemtrec	(800) 424-9300
National Response Center	(800) 424-8802
Tetra Tech Jacksonville Office	(904) 636-6125
Project Manager, Ben Marshall	(904) 730-4669 x220 (904) 718-4529 (Cell)
CLEAN Health and Safety Manager, Matthew M. Soltis	(412) 921-8912 (412) 260-6681 (Cell)
Project Health and Safety Officer, James K. Laffey	(412) 921-8678 (412) 370-6668 (Cell)

Note: When calling base telephone numbers from within the base (i.e., from an on-base telephone), dial a zero (0) and the last four digits of the telephone number. For example, to contact the Base Medical Center dial 05444. When calling from your cell phone all numbers must be dialed.

13.6 ROUTE TO HOSPITAL

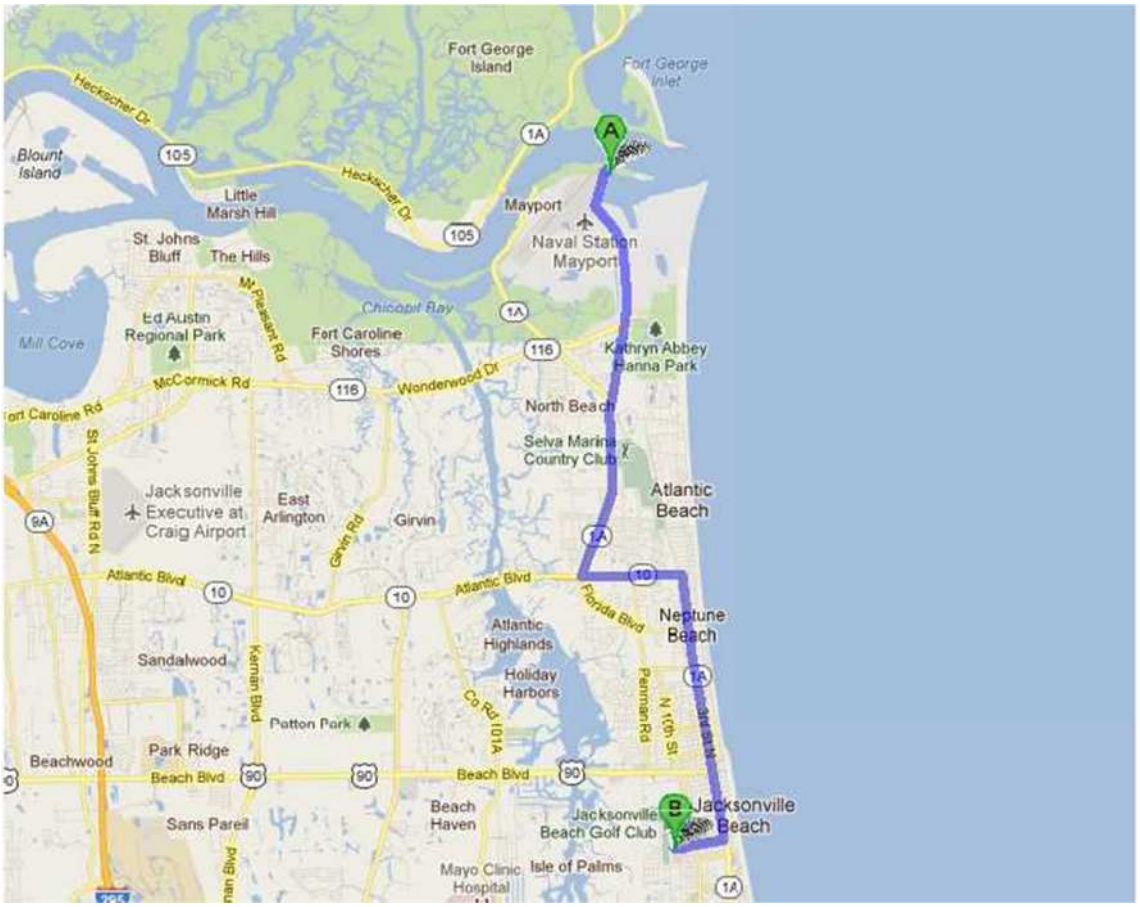
Baptist Medical Center - Beaches
1350 13th Ave S Jacksonville Beach, FL 32250-3203

Total approximately 8-10 miles

- Continue onto Mayport Rd 2.0 mi
- Continue onto Old Mayport Rd 0.2 mi
- Left to merge onto Atlantic Blvd 1.3 mi
- Right onto 3rd St 3.4 mi
- Right onto 13th Ave S 0.7 mi

Hospital on the left

FIGURE A-13-1
ROUTE TO BAPTIST MEDICAL CENTER BEACHES



13.7 CRITERIA FOR ALERTING LOCAL COMMUNITY RESPONDERS

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

- Dial 9-1-1 and call other pertinent emergency contacts listed in Table A-13-1 and report the incident.

- Give the emergency operator the:
  - Location of the emergency
  - Type of emergency
  - Number of injured
  - A brief description of the incident.

- Stay on the phone and follow the instructions given by the operator.

- The operator will then notify and dispatch the proper emergency response agencies.

14.0 REFERENCES, MATERIALS AND DOCUMENTATION

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

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

The Tetra Tech FOL shall ensure the following materials/documents are taken to the project site and used when required. The following documentation is to be posted or maintained at the site for quick reference purposes. For this project, the items so noted below will be maintained in the Tetra Tech work trailer, located on Defense Highway, one mile north of the site.

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

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

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

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

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

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

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

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

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

ATTACHMENT I

SITE-SPECIFIC TRAINING DOCUMENTATION FORM

EMPLOYEE TRAINING, QUALIFICATIONS AND MEDICAL CLEARANCE

(40-Hour HAZWOPER Certificates; 8-Hour HAZWOPER Refresher Certificates; First Aid/CPR Certificates; Employee Resumes as required)

TO BE ATTACHED BY PM/FOL

SITE-SPECIFIC TRAINING DOCUMENTATION

My signature below indicates that I am aware of the potential hazardous nature of performing field investigation activities at NAVSTA Mayport, Mayport, Florida, and that I have received site-specific training which included the following elements:

- Names of personnel responsible for site safety and health
- Safety, health, and other hazards present on site
- Use of personal protective equipment
- Safe use of engineering controls and equipment
- Medical surveillance requirements
- Signs and symptoms of overexposure
- Emergency response procedures (evacuation/assembly area)
- Incipient response procedures
- Review of the contents of relevant Material Safety Data Sheets
- Review of the use of AHAs
- Stop work authorization and process

I have been given the opportunity to ask questions and my questions have been satisfactorily answered. The dates of my training and medical surveillance requirements indicated below are accurate.

Name Printed and Signature	Site-Specific	40-Hour	8-Hour Refresher	8-Hour Supervisor	Medical Exam	Basic First Aid/BBP	Other

ATTACHMENT II

MEDICAL DATA SHEET

MEDICAL DATA SHEET

This Medical Data Sheet must be completed by on-site personnel and kept in a secured location or on your person during site operations. This data sheet will accompany any personnel when medical assistance is needed or if transport to hospital facilities is required.

Project: _____

Name: _____ Home Telephone _____

Address: _____

Age: _____ Height: _____ Weight: _____

Person to notify in the event of an emergency: Name_____

(Relationship):_____Phone: _____

Drug or other Allergies: _____

Doctor Prescribed Antidotes:_____Prescription Expiration date:_____

Particular Sensitivities (Previous Medical Conditions): _____

_____

Do You Wear Contacts?_____

What medications are you presently using? _____

_____

Name, Address, and Phone Number of your personal physician: _____

_____

_____

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

HIPAA took effect in 1996 then was amended in April 14, 2003. Loosely interpreted, HIPAA regulates the disclosure of Protected Health Information (PHI) by the entity collecting that information. PHI is any information about health status (such as that you may report on this Medical Data Sheet), provision of health care, or other information. HIPAA also requires Tetra Tech to ensure the confidentiality of PHI. This Act can affect the ability of the Medical Data Sheet to contain and convey information you would want a Doctor to know if you were incapacitated. So before you complete the Medical Data Sheet understand that this form may not be maintained in a secure location. It will be maintained in a file box or binder accessible to other members of the field crew so that they can access this form so it may accompany an injured party to the hospital.

DO NOT include information that you do not wish others to know, only information that may be pertinent in an emergency situation or treatment.

_____ _____ _____

Name (Print clearly) Signature Date

ATTACHMENT III

EQUIPMENT INSPECTION CHECKLIST FOR DRILL RIGS

Equipment Inspection Checklist for Drill Rigs

Company:_____ **Unit/Serial No#:**_____

Inspection Date: _____/_____/_____ **Time:**_____:_____ **Equipment Type:**_____
(e.g, Drill Rigs Hollow Stem, Mud Rotary, Direct Push, HDD)

Project Name:_____ **Project No#:**_____

Yes	No	NA	Requirement	Comments
			Emergency Stop Devices	
☐	☐	☐	• Emergency Stop Devices (At points of operation)	
☐	☐	☐	• Have all emergency shut offs identified been communicated to the field crew?	
☐	☐	☐	• Has a person been designated as the Emergency Stop Device Operator?	
			Highway Use	
☐	☐	☐	• Cab, mirrors, safety glass?	
☐	☐	☐	• Turn signals, lights, brake lights, etc. (front/rear) for equipment approved for highway use?	
☐	☐	☐	• Seat Belts?	
☐	☐	☐	• Is the equipment equipped with audible back-up alarms and back-up lights?	
☐	☐	☐	• Horn and gauges	
☐	☐	☐	• Brake condition (dynamic, park, etc.)	
☐	☐	☐	• Tires (Tread) or tracks	
☐	☐	☐	• Windshield wipers	
☐	☐	☐	• Exhaust system	
☐	☐	☐	• Steering (standard and emergency)	
☐	☐	☐	• Wheel Chocks?	
☐	☐	☐	• Are tools and material secured to prevent movement during transport? Especially those within the cab?	
☐	☐	☐	• Are there flammables or solvents or other prohibited substances stored within the cab?	
☐	☐	☐	• Are tools or debris in the cab that may adversely influence operation of the vehicle (in and around brakes, clutch, gas pedals)	

Yes	No	NA	Requirement	Comments
☐ ☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐ ☐	Fluid Levels: • Engine oil • Transmission fluid • Brake fluid • Cooling system fluid • Hoses and belts • Hydraulic oil	
☐ ☐ ☐	☐ ☐ ☐	☐ ☐ ☐	High Pressure Hydraulic Lines • Obvious damage • Operator protected from accidental release • Coupling devices, connectors, retention cables/pins are in good condition and in place	
☐ ☐ ☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐ ☐ ☐	Mast Condition • Structural components/tubing • Connection points • Pins • Welds • Outriggers • Operational • Plumb (when raised)	
☐ ☐ ☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐ ☐ ☐	Hooks • Are the hooks equipped with Safety Latches? • Does it appear that the hook is showing signs of wear in excess of 10% original dimension? • Is there a bend or twist exceeding 10% from the plane of an unbent hook? • Increase in throat opening exceeding 15% from new condition • Excessive nicks and/or gouges • Clips • Number of U-Type (Crosby) Clips (cable size 5/16 – 5/8 = 3 clips minimum) (cable size 3/4 – 1 inch = 4 clips minimum) (cable size 1 1/8 – 1 3/8 inch = 5 clips minimum)	

Yes	No	NA	Requirement	Comments
			Power cable and/or hoist cable	
☐	☐	☐	• Reduction in Rope diameter π (5/16 wire rope>1/64 reduction nominal size -replace) (3/8 to 1/2 wire rope>1/32 reduction nominal size-replace) (9/16 to 3/4 wire rope>3/64 reduction nominal size-replace)	
☐	☐	☐	• Number of broken wires (6 randomly broken wires in one rope lay) (3 broken wires in one strand)	
☐	☐	☐	• Number of wire rope wraps left on the Running Drum at nominal use (≥3 required)	
☐	☐	☐	- Lead (primary) sheave is centered on the running drum	
☐	☐	☐	• Lubrication of wire rope (adequate?)	
☐	☐	☐	• Kinks, bends – Flattened to > 50% diameter	
			Hemp/Fiber rope (Cathead/Split Spoon Hammer)	
☐	☐	☐	• Minimum ¾; maximum 1 inch rope diameter (Inspect for physical damage)	
☐	☐	☐	• Rope to hammer is securely fastened	
			Safety Guards –	
☐	☐	☐	• Around rotating apparatus (belts, pulleys, sprockets, spindles, drums, flywheels, chains) all points of operations protected from accidental contact?	
☐	☐	☐	• Hot pipes and surfaces exposed to accidental contact?	
☐	☐	☐	• High pressure lines	
☐	☐	☐	• Nip/pinch points	
			Operator Qualifications	
☐	☐	☐	• Does the operator have proper licensing where applicable, (e.g., CDL)?	
☐	☐	☐	• Does the operator, understand the equipment's operating instructions?	
☐	☐	☐	• Is the operator experienced with this equipment?	
☐	☐	☐	• Is the operator 21 years of age or more?	

Yes	No	NA	Requirement	Comments
			PPE Required for Drill Rig Exclusion Zone	
☐	☐	☐	• Hardhat	
☐	☐	☐	• Safety glasses	
☐	☐	☐	• Work gloves	
☐	☐	☐	• Chemical resistant gloves_____	
☐	☐	☐	• Steel toed Work Boots	
☐	☐	☐	• Chemical resistant Boot Covers	
☐	☐	☐	• Apron	
☐	☐	☐	• Coveralls Tyvek, Saranex, cotton)_____	
			Other Hazards	
☐	☐	☐	• Excessive Noise Levels? _____dBA	
☐	☐	☐	• Chemical hazards (Drilling supplies - Sand, bentonite, grout, fuel, etc.)	
			- MSDSs available?	
☐	☐	☐	• Will On-site fueling occur	
☐	☐	☐	- Safety cans available?	
☐	☐	☐	- Fire extinguisher (Type/Rating -_____ _)	
☐	☐	☐		

Approved for Use ☐ Yes ☐ No ☐ See Comments

_____
Site Health and Safety Officer

_____
Operator

ATTACHMENT IV

TETRA TECH STANDARD OPERATING PROCEDURES (SOP) UTILITY LOCATION AND EXCAVATION CLEARANCE

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1.0 PURPOSE

Utilities such as electric service lines, natural or propane gas lines, water and sewage lines, telecommunications, and steam lines are very often in the immediate vicinity of work locations. Contact with underground or overhead utilities can have serious consequences including employee injury/fatality, property and equipment damage, substantial financial impacts, and loss of utility service to users.

The purpose of this procedure is to provide minimum requirements and technical guidelines regarding the appropriate procedures to be followed when performing subsurface and overhead utility locating services. It is the policy of Tetra Tech NUS, Inc. (TtNUS) to provide a safe and healthful work environment for the protection of our employees. The purpose of this Standard Operating Procedure (SOP) is to aid in achieving the objectives of this policy, to present the acceptable procedures pertaining to utility locating and excavation clearance activities, and to present requirements and restrictions relevant to these types of activities. This SOP must be reviewed by any employee potentially involved with underground or overhead utility locating and avoidance activities.

2.0 SCOPE

This procedure applies to all TtNUS field activities where there may be potential contact with underground or overhead utilities. This procedure provides a description of the principles of operation, instrumentation, applicability, and implementability of typical methods used to determine the presence and avoidance of contact with utility services. This procedure is intended to assist with work planning and scheduling, resource planning, field implementation, and subcontractor procurement. Utility locating and excavation clearance requires site-specific information prior to the initiation of any such activities on a specific project. This SOP is not intended to provide a detailed description of methodology and instrument operation. Specialized expertise during both planning and execution of several of the methods presented may also be required.

3.0 GLOSSARY

Electromagnetic Induction (EMI) Survey - A geophysical exploration method whereby electromagnetic fields are induced in the ground and the resultant secondary electromagnetic fields are detected as a measure of ground conductivity.

Magnetometer – A device used for precise and sensitive measurements of magnetic fields.

Magnetic Survey – A geophysical survey method that depends on detection of magnetic anomalies caused by the presence of buried ferromagnetic objects.

Metal Detection – A geophysical survey method that is based on electromagnetic coupling caused by underground conductive objects.

Vertical Gradiometer – A magnetometer equipped with two sensors that are vertically separated by a fixed distance. It is best suited to map near surface features and is less susceptible to deep geologic features.

Ground Penetrating Radar – Ground Penetrating Radar (GPR) involves specialized radar equipment whereby a signal is sent into the ground via a transmitter. Some portion of the signal will be reflected from the subsurface material, which is then recorded with a receiver and electronically converted into a graphic picture.

4.0 RESPONSIBILITIES

Project Manager (PM)/Task Order Manager (TOM) - Responsible for ensuring that all field activities are conducted in accordance with this procedure.

Site Manager (SM)/Field Operations Leader (FOL) - Responsible for the onsite verification that all field activities are performed in compliance with approved SOPs or as otherwise directed by the approved project plan(s).

Site Health & Safety Officer (SHSO) – Responsible to provide technical assistance and verify full compliance with this SOP. The SHSO is also responsible for reporting any deficiencies to the Corporate Health and Safety Manager (HSM) and to the PM/TOM.

Health & Safety Manager (HSM) – Responsible for preparing, implementing, and modifying corporate health and safety policy and this SOP.

Site Personnel – Responsible for performing their work activities in accordance with this SOP and the TtNUS Health and Safety Policy.

5.0 PROCEDURES

This procedure addresses the requirements and technical procedures that must be performed to minimize the potential for contact with underground and overhead utility services. These procedures are addressed individually from a buried and overhead standpoint.

5.1 Buried Utilities

Buried utilities present a heightened concern because their location is not typically obvious by visual observation, and it is common that their presence and/or location is unknown or incorrectly known on client properties. This procedure must be followed prior to beginning any subsurface probing or excavation that might potentially be in the vicinity of underground utility services. In addition, the Utility Clearance Form (Attachment 3) must be completed for every location or cluster of locations where intrusive activities will occur.

Where the positive identification and de-energizing of underground utilities cannot be obtained and confirmed using the following steps, the PM/TOM is responsible for arranging for the procurement of a qualified, experienced, utility locating subcontractor who will accomplish the utility location and demarcation duties specified herein.

1. A comprehensive review must be made of any available property maps, blue lines, or as-builts prior to site activities. Interviews with local personnel familiar with the area should be performed to provide additional information concerning the location of potential underground utilities. Information regarding utility locations shall be added to project maps upon completion of this exercise.

2., A visual site inspection must be performed to compare the site plan information to actual field conditions. Any findings must be documented and the site plan/maps revised. The area(s) of proposed excavation or other subsurface activities must be marked at the site in white paint or pin flags to identify those locations of the proposed intrusive activities. The site inspection should focus on locating surface indications of potential underground utilities. Items of interest include the presence of nearby area lights, telephone service, drainage grates, fire hydrants, electrical service vaults/panels, asphalt/concrete scares and patches, and topographical depressions. Note the location of any emergency shut off switches. Any additional information regarding utility

locations shall be added to project maps upon completion of this exercise and returned to the PM/TOM.

3. If the planned work is to be conducted on private property (e.g., military installations, manufacturing facilities, etc.) the FOL must identify and contact appropriate facility personnel (e.g., public works or facility engineering) before any intrusive work begins to inquire about (and comply with) property owner requirements. It is important to note that private property owners may require several days to several weeks advance notice prior to locating utilities.

4. If the work location is on public property, the state agency that performs utility clearances must be notified (see Attachment 1). State “one-call” services must be notified prior to commencing fieldwork per their requirements. Most one-call services require, by law, 48- to 72-hour advance notice prior to beginning any excavation. Such services typically assign a "ticket" number to the particular site. This ticket number must be recorded for future reference and is valid for a specific period of time, but may be extended by contacting the service again. The utility service will notify utility representatives who then mark their respective lines within the specified time frame. It should be noted that most military installations own their own utilities but may lease service and maintenance from area providers. Given this situation, “one call” systems may still be required to provide location services on military installations.

5. Utilities must be identified and their locations plainly marked using pin flags, spray paint, or other accepted means. The location of all utilities must be noted on a field sketch for future inclusion on project maps. Utility locations are to be identified using the following industry-standard color code scheme, unless the property owner or utility locator service uses a different color code:

white	excavation/subsurface investigation location
red	electrical
yellow	gas, oil, steam
orange	telephone, communications
blue	water, irrigation, slurry
green	sewer, drain

6. Where utility locations are not confirmed with a high degree of confidence through drawings, schematics, location services, etc., the work area must be thoroughly investigated prior to beginning the excavation. In these situations, utilities must be identified using safe and effective methods such as passive and intrusive surveys, or the use of non-conductive hand tools. Also, in situations where such hand tools are used, they should always be used in conjunction with suitable detection equipment, such as the items described in Section 6.0 of this SOP. Each method has advantages and disadvantages including complexity, applicability, and price. It also should be noted that in some states, initial excavation is required by hand to a specified depth.

7. At each location where trenching or excavating will occur using a backhoe or other heavy equipment, and where utility identifications and locations cannot be confirmed prior to groundbreaking, the soil must be probed using a device such as a tile probe which is made of non-conductive material such as fiberglass. If these efforts are not successful in clearing the excavation area of suspect utilities, hand shoveling must be performed for the perimeter of the intended excavation.

8. All utilities uncovered or undermined during excavation must be structurally supported to prevent potential damage. Unless necessary as an emergency corrective measure, TtNUS shall not make any repairs or modifications to existing utility lines without prior permission of the utility owner, property owner, and Corporate HSM. All repairs require that the line be locked-out/tagged-out prior to work.

5.2 Overhead Power Lines

If it is necessary to work within the minimum clearance distance of an overhead power line, the overhead line must be de-energized and grounded, or re-routed by the utility company or a registered electrician. If protective measures such as guarding, isolating, or insulating are provided, these precautions must be adequate to prevent employees from contacting such lines directly with any part of their body or indirectly though conductive materials, tools, or equipment.

The following table provides the required minimum clearances for working in proximity to overhead power lines.

Nominal Voltage	Minimum Clearance
0 -50 kV	10 feet, or one mast length; whichever is greater
50+ kV	10 feet plus 4 inches for every 10 kV over 50 kV or 1.5 mast lengths; whichever is greater

6.0 UNDERGROUND LOCATING TECHNIQUES

A variety of supplemental utility locating approaches are available and can be applied when additional assurance is needed. The selection of the appropriate method(s) to employ is site-specific and should be tailored to the anticipated conditions, site and project constraints, and personnel capabilities.

6.1 Geophysical Methods

Geophysical methods include electromagnetic induction, magnetics, and ground penetrating radar. Additional details concerning the design and implementation of electromagnetic induction, magnetics, and ground penetrating radar surveys can be found in one or more of the TtNUS SOPs included in the References (Section 8.0).

Electromagnetic Induction

Electromagnetic Induction (EMI) line locators operate either by locating a background signal or by locating a signal introduced into the utility line using a transmitter. A utility line acts like a radio antenna, producing electrons, which can be picked up with a radiofrequency receiver. Electrical current carrying conductors have a 60HZ signal associated with them. This signal occurs in all power lines regardless of voltage. Utilities in close proximity to power lines or used as grounds may also have a 60HZ signal, which can be picked up with an EM receiver. A typical example of this type of geophysical equipment is an EM-61.

EMI locators specifically designed for utility locating use a special signal that is either indirectly induced onto a utility line by placing the transmitter above the line or directly induced using an induction clamp. The clamp induces a signal on the specific utility and is the preferred method of tracing since there is little chance of the resulting signals being interfered with. A good example of this type of equipment is the Schonstedt® MAC-51B locator. The MAC-51B performs inductively traced surveys, simple magnetic locating, and traced nonmetallic surveys.

When access can be gained inside a conduit to be traced, a flexible insulated trace wire can be used. This is very useful for non-metallic conduits but is limited by the availability of gaining access inside the pipe.

Magnetics

Magnetic locators operate by detecting the relative amounts of buried ferrous metal. They are incapable of locating or identifying nonferrous utility lines but can be very useful for locating underground storage tanks (UST's), steel utility lines, and buried electrical lines. A typical example of this type of equipment is the Schonstedt® GA-52Cx locator. The GA-52Cx is capable of locating 4-inch steel pipe up to 8 feet deep.

Non-ferrous lines are often located by using a typical plumbing tool (snake) fed through the line. A signal is then introduced to the snake that is then traced.

Ground Penetrating Radar

Ground Penetrating Radar (GPR) involves specialized radar equipment whereby a signal is sent into the ground via a transmitter. Some portion of the signal will be reflected from the subsurface material, which is then recorded with a receiver and electronically converted into a graphic picture. In general, an object which is harder than the surrounding soil will reflect a stronger signal. Utilities, tunnels, UST's, and footings will reflect a stronger signal than the surrounding soil. Although this surface detection method may determine the location of a utility, this method does not specifically identify utilities (i.e., water vs. gas, electrical vs. telephone); hence, verification may be necessary using other methods. This method is somewhat limited when used in areas with clay soil types or with a high water table.

6.2 Passive Detection Surveys

Acoustic Surveys

Acoustic location methods are generally most applicable to waterlines or gas lines. A highly sensitive Acoustic Receiver listens for background sounds of water flowing (at joints, leaks, etc.) or to sounds introduced into the water main using a transducer. Acoustics may also be applicable to determine the location of plastic gas lines.

Thermal Imaging

Thermal (i.e., infrared) imaging is a passive method for detecting the heat emitted by an object. Electronics in the infrared camera convert subtle heat differentials into a visual image on the viewfinder or a monitor. The operator does not look for an exact temperature; rather they look for heat anomalies (either elevated or suppressed temperatures) characteristic of a potential utility line.

The thermal fingerprint of underground utilities results from differences in temperature between the atmosphere and the fluid present in a pipe or the heat generated by electrical resistance. In addition, infrared scanners may be capable of detecting differences in the compaction, temperature and moisture content of underground utility trenches. High-performance thermal imagery can detect temperature differences to hundredths of a degree.

6.3 Intrusive Detection Surveys

Vacuum Excavation

Vacuum excavation is used to physically expose utility services. The process involves removing the surface material over approximately a 1' x 1' area at the site location. The air-vacuum process proceeds with the simultaneous action of compressed air-jets to loosen soil and vacuum extraction of the resulting

debris. This process ensures the integrity of the utility line during the excavation process, as no hammers, blades, or heavy mechanical equipment comes into contact with the utility line, eliminating the risk of damage to utilities. The process continues until the utility is uncovered. Vacuum excavation can be used at the proposed site location to excavate below the "utility window" which is usually 8 feet.

Hand Excavation

When the identification and location of underground utilities cannot be positively confirmed through document reviews and/or other methods, borings and excavations may be cleared via the use of non-conductive hand tools. This should always be done in conjunction with the use of detection equipment. This would be required for all locations where there is a potential to impact buried utilities. The minimum hand-excavation depth that must be reached is to be determined considering the geographical location of the work site. This approach recognizes that the placement of buried utilities is influenced by frost line depths that vary by geographical region. Attachment 2 presents frost line depths for the regions of the contiguous United States. At a minimum, hand excavation depths must be at least to the frost line depth (see Attachment 2) plus two (2) feet, but never less than 4 feet below ground surface (bgs). For hand excavation, the hole created must be reamed large enough to be at least the diameter of the drill rig auger or bit prior to drilling. For soil gas surveys, the survey probe shall be placed as close as possible to the cleared hand excavation. It is important to note that a post-hole digger must not be used in this type of hand excavation activity.

Tile Probe Surveys

For some soil types, site conditions, and excavation requirements, non-conductive tile probes may be used. A tile probe is a “T”-handled rod of varying lengths that can be pushed into the soil to determine if any obstructions exist at that location. Tile probes constructed of fiberglass or other nonconductive material are readily-available from numerous vendors. Tile probes must be performed to the same depth requirements as previously specified. As with other types of hand excavating activities, the use of a non-conductive tile probe, should always be in conjunction with suitable utility locating detection equipment.

7.0 INTRUSIVE ACTIVITIES SUMMARY

The following list summarizes the activities that must be performed prior to beginning subsurface activities:

1. Map and mark all subsurface locations and excavation boundaries using white paint or markers specified by the client or property owner.

2. Notify the property owner and/or client that the locations are marked. At this point, drawings of locations or excavation boundaries shall be provided to the property owner and/or client so they may initiate (if applicable) utility clearance.

   Note: Drawings with confirmed locations should be provided to the property owner and/or client as soon as possible to reduce potential time delays.

3. Notify “One Call” service. If possible, arrange for an appointment to show the One Call representative the surface locations or excavation boundaries in person. This will provide a better location designation to the utilities they represent. You should have additional drawings should you need to provide plot plans to the One Call service.

4. Implement supplemental utility detection techniques as necessary and appropriate to conform utility locations or the absence thereof.

5. Complete Attachment 3, Utility Clearance Form. This form should be completed for each excavation location. In situations where multiple subsurface locations exist within the close proximity of one another, one form may be used for multiple locations provided those locations are noted on the Utility Clearance Form. Upon completion, the Utility Clearance Form and revised/annotated utility location map becomes part of the project file.

8.0 REFERENCES

OSHA Letter of Interpretation, Mr. Joseph Caldwell, Attachment 4
OSHA 29 CFR 1926(b)(2)
OSHA 29 CFR 1926(b)(3)
Tt Utility Locating and Clearance Policy
Tt SOP GH-3.1; Resistivity and Electromagnetic Induction
Tt SOP GH-3.2; Magnetic and Metal Detection Surveys
Tt SOP GH-3.4; Ground-penetrating Radar Surveys

ATTACHMENT 1
LISTING OF UNDERGROUND UTILITY CLEARANCE RESOURCES

American Public Works Association
2345 Grand Boulevard, Suite 500, Kansas City, MO 64108-2625
Phone (816) 472-6100 • Fax (816) 472-1610
Web www.apwa.net • E-mail apwa@apwa.net

ONE-CALL SYSTEMS INTERNATIONAL CONDENSED DIRECTORY

Alabama
Alabama One-Call
1-800-292-8525

Alaska
Locate Call Center of Alaska, Inc.
1-800-478-3121

Arizona
Arizona Blue Stake
1-800-782-5348

Arkansas
Arkansas One Call System, Inc.
1-800-482-8998

California
Underground Service Alert North
1-800-227-2600
Underground Service Alert of Southern California
1-800-227-2600

Colorado
Utility Notification Center of Colorado
1-800-922-1987

Connecticut
Call Before You Dig
1-800-922-4455

Delaware
Miss Utility of Delmarva
1-800-282-8555

Florida
Sunshine State One-Call of Florida, Inc.
1-800-432-4770

Georgia
Underground Protection Center, Inc.
1-800-282-7411

Hawaii
Underground Service Alert North
1-800-227-2600

Idaho
Dig Line Inc.
1-800-342-1585
Kootenai County One-Call
1-800-428-4950
Shoshone - Benewah One-Call
1-800-398-3285

Illinois
JULIE, Inc.
1-800-892-0123
Digger (Chicago Utility Alert Network)
312-744-7000

Indiana
Indiana Underground Plant Protection Service
1-800-382-5544

Iowa
Iowa One-Call
1-800-292-8989

Kansas
Kansas One-Call System, Inc.
1-800-344-7233

Kentucky
Kentucky Underground Protection Inc.
1-800-752-6007

Louisiana
Louisiana One Call System, Inc.
1-800-272-3020

Maine
Dig Safe System, Inc.
1-888-344-7233

Maryland
Miss Utility
1-800-257-7777
Miss Utility of Delmarva
1-800-282-8555

Massachusetts
Dig Safe System, Inc.
1-888-344-7233

Michigan
Miss Dig System, Inc.
1-800-482-7171

Minnesota
Gopher State One Call
1-800-252-1166

Mississippi
Mississippi One-Call System, Inc
1-800-227-6477

Missouri
Missouri One-Call System, Inc.
1-800-344-7483

Montana
Utilities Underground Protection Center
1-800-424-5555
Montana One Call Center
1-800-551-8344

Nebraska
Diggers Hotline of Nebraska
1-800-331-5666

Nevada
Underground Service Alert North
1-800-227-2600

New Hampshire
Dig Safe System, Inc.
1-888-344-7233

New Jersey
New Jersey One Call
1-800-272-1000

New Mexico
New Mexico One Call System, Inc.
1-800-321-2537
Las Cruces- Dona Ana Blue Stakes
1-888-526-0400

New York
Dig Safely New York
1-800-962-7962
New York City- Long Island One Call Center
1-800-272-4480

North Carolina
The North Carolina One-Call Center, Inc.
1-800-632-4949

North Dakota
North Dakota One-Call
1-800-795-0555

Ohio
Ohio Utilities Protection Service
1-800-362-2764
Oil & Gas Producers Underground Protect'n Svc
1-800-925-0988

Oklahoma
Call Okie
1-800-522-6543

Oregon
Oregon Utility Notification Center/One Call Concepts
1-800-332-2344

Pennsylvania
Pennsylvania One Call System, Inc.
1-800-242-1776

Rhode Island
Dig Safe System, Inc.
1-888-344-7233

South Carolina
Palmetto Utility Protection Service Inc.
1-888-721-7877

South Dakota
South Dakota One Call
1-800-781-7474

Tennessee
Tennessee One-Call System, Inc.
1-800-351-1111

ATTACHMENT 1 (Continued)

Texas
Texas One Call System
1-800-245-4545
Texas Excavation Safety System, Inc.
1-800-344-8377
Lone Star Notification Center
1-800-669-8344

Utah
Blue Stakes of Utah
1-800-662-4111

Vermont
Dig Safe System, Inc.
1-888-344-7233

Virginia
Miss Utility of Virginia
1-800-552-7001
Miss Utility (Northern Virginia)
1-800-257-7777

Washington
Utilities Underground Location Center
1-800-424-5555
Northwest Utility Notification Center
1-800-553-4344
Inland Empire Utility Coordinating Council
509-456-8000

West Virginia
Miss Utility of West Virginia, Inc.
1-800-245-4848

Wisconsin
Diggers Hotline, Inc.
1-800-242-8511

Wyoming
Wyoming One-Call System, Inc.
1-800-348-1030
Call Before You Dig of Wyoming
1-800-849-2476

District of Columbia
Miss Utility
1-800-257-7777

Alberta
Alberta One-Call Corporation
1-800-242-3447

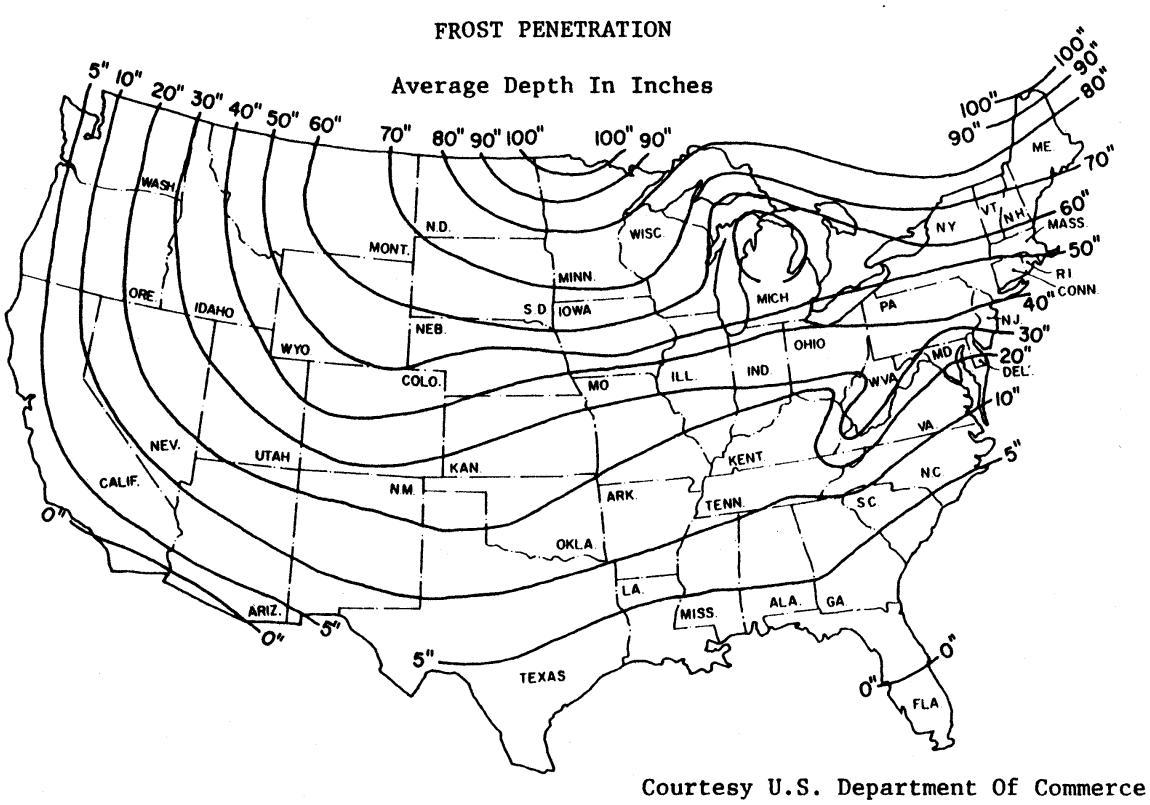
British Columbia
BC One Call
1-800-474-6886

Ontario
Ontario One-Call System
1-800-400-2255

Quebec
Info-Excavation
1-800-663-9228

ATTACHMENT 2

FROST LINE PENETRATION DEPTHS BY GEOGRAPHIC LOCATION



Courtesy U.S. Department Of Commerce

ATTACHMENT 3
UTILITY CLEARANCE FORM

Client: _____ Project Name: _____

Project No.: _____ Completed By: _____

Location Name: _____ Work Date: _____

Excavation Method/Overhead Equipment:_____

1. Underground Utilities — Circle One

a)	Review of existing maps?	yes no N/A
b)	Interview local personnel?	yes no N/A
c)	Site visit and inspection?	yes no N/A
d)	Excavation areas marked in the field?	yes no N/A
e)	Utilities located in the field?	yes no N/A
f)	Located utilities marked/added to site maps?	yes no N/A
g)	Client contact notified Name _____ Telephone: _____ Date: _____	yes no N/A
g)	State One-Call agency called? Caller: _____ Ticket Number: _____ Date: _____	yes no N/A
h)	Geophysical survey performed? Survey performed by:_____ Method: _____ Date: _____	yes no N/A
i)	Hand excavation performed (with concurrent use of utility detection device)? Completed by:_____ Total depth:_____feet Date: _____	yes no N/A
j)	Trench/excavation probed? Probing completed by:_____ Depth/frequency: _____ Date: _____	yes no N/A

2. Overhead Utilities — Present Absent

a)	Determination of nominal voltage	yes no N/A
b)	Marked on site maps	yes no N/A
c)	Necessary to lockout/insulate/re-route	yes no N/A
d)	Document procedures used to lockout/insulate/re-route	yes no N/A
e)	Minimum acceptable clearance (SOP Section 5.2): _____	

3. Notes:

_____

_____

_____

Approval:

_____ _____

Site Manager/Field Operations Leader Date

c: PM/Project File
Program File

ATTACHMENT 4
OSHA LETTER OF INTERPRETATION

Mr. Joseph Caldwell
Consultant
Governmental Liaison
Pipeline Safety Regulations
211 Wilson Boulevard
Suite 700
Arlington, Virginia 22201

Re: Use of hydro-vacuum or non-conductive hand tools to locate underground utilities.

Dear Mr. Caldwell:

In a letter dated July 7, 2003, we responded to your inquiry of September 18, 2002, regarding the use of hydro-vacuum equipment to locate underground utilities by excavation. After our letter to you was posted on the OSHA website, we received numerous inquiries that make it apparent that aspects of our July 7 letter are being misunderstood. In addition, a number of industry stakeholders, including the National Utility Contractors Association (NUCA), have provided new information regarding equipment that is available for this work.

To clarify these issues, we are withdrawing our July 7 letter and issuing this replacement response to your inquiry.

Question: *Section 1926.651 contains several requirements that relate to the safety of employees engaged in excavation work. Specifically, paragraphs (b)(2) and (b)(3) relate in part to the safety of the means used to locate underground utility installations that, if damaged during an uncovering operation, could pose serious hazards to employees.*

Under these provisions, what constitutes an acceptable method of uncovering underground utility lines, and further, would the use of hydro-vacuum excavation be acceptable under the standard?

Answer

Background

Two sections of 29 CFR 1926 Subpart P (Excavations), 1926.651(Specific excavation requirements), govern methods for uncovering underground utility installations. Specifically, paragraph (b)(2) states:

> When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours * * * or cannot establish the exact location of these installations, the employer may proceed, provided the employer does so with caution, and provided detection equipment or other acceptable means to locate utility installations are used. (emphasis added).

Paragraph (b)(3) provides:

ATTACHMENT 4 (Continued)

> When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means. (emphasis added).

Therefore, "acceptable means" must be used where the location of the underground utilities have not been identified by the utility companies and detection equipment is not used.

Subpart P does not contain a definition of either "other acceptable means" or "safe and acceptable means." The preambles to both the proposed rule and the final rule discussed the rationale behind the wording at issue. For example, the preamble to the proposed rule, 52 Fed. Reg. 12301 (April 15, 1987), noted that a 1972 version of this standard contained language that specified "careful probing or hand digging" as the means to uncover utilities. The preamble then noted that an amendment to the 1972 standard later deleted that language "to allow other, *equally effective means* of locating such installations." The preamble continued that in the 1987 proposed rule, OSHA again proposed using language in section (b)(3) that would provide another example of an acceptable method of uncovering utilities that could be used *where the utilities have not been marked and detection equipment is not being used* – "probing with hand-held tools." This method was rejected in the final version of 29 CFR 1926. As OSHA explained in the preamble to the final rule, 54 Fed. Reg. 45916 (October 31, 1989):

> OSHA received two comments * * * and input from ACCSH [OSHA's Advisory Committee on Construction Safety and Health] * * * on this provision. All commenters recommended dropping 'such as probing with hand-held tools' from the proposed provision, because this could create a hazard to employees by damaging the installation or its insulation.

In other words, the commenters objected to the use of hand tools being used unless detection equipment was used in conjunction with them. OSHA then concluded its discussion relative to this provision by agreeing with the commentators and ultimately not including any examples of "acceptable means" in the final provision.

Non-conductive hand tools are permitted

This raises the question of whether the standard permits the use of hand tools alone -- without also using detection equipment. NUCA and other industry stakeholders have recently informed us that non-conductive hand tools that are appropriate to be used to locate underground utilities are now commonly available.

Such tools, such as a "shooter" (which has a non-conductive handle and a snub nose) and non-conductive or insulated probes were not discussed in the rulemaking. Since they were not considered at that time, they were not part of the class of equipment that was thought to be unsafe for this purpose. Therefore, we conclude that the use of these types of hand tools, when used with appropriate caution, is an "acceptable means" for locating underground utilities.

ATTACHMENT 4 (Continued)

Hydro-vacuum excavation

It is our understanding that some hydro-vacuum excavation equipment can be adjusted to use a minimum amount of water and suction pressure. When appropriately adjusted so that the equipment will not damage underground utilities (especially utilities that are particularly vulnerable to damage, such as electrical lines), use of such equipment would be considered a "acceptable means" of locating underground utilities. However, if the equipment cannot be sufficiently adjusted, then this method would not be acceptable under the standard.

Other technologies

We are not suggesting that these are the only devices that would be "acceptable means" under the standard. Industry stakeholders have informed us that there are other types of special excavation equipment designed for safely locating utilities as well.

We apologize for any confusion our July 7 letter may have caused. If you have further concerns or questions, please feel free to contact us again by fax at: U.S. Department of Labor, OSHA, Directorate of Construction, Office of Construction Standards and Compliance Assistance, fax # 202-693-1689. You can also contact us by mail at the above office, Room N3468, 200 Constitution Avenue, N.W., Washington, D.C. 20210, although there will be a delay in our receiving correspondence by mail.

Sincerely,

Russell B. Swanson, Director
Directorate of Construction

NOTE: OSHA requirements are set by statute, standards and regulations. Our interpretation letters explain these requirements and how they apply to particular circumstances, but they cannot create additional employer obligations. This letter constitutes OSHA=s interpretation of the requirements discussed. Note that our enforcement guidance may be affected by changes to OSHA rules. Also, from time to time we update our guidance in response to new information. To keep apprised of such developments, you can consult OSHA's website at http://www.osha.gov.

ATTACHMENT V

OSHA POSTER

Job Safety and Health

It's the law!

OSHA

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

EMPLOYEES:

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

EMPLOYERS:

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

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