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NAS PENSACOLA
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FINAL SAMPLING AND ANALYSIS PLANS SITES 44, 45 AND 46 WITH TRANSMITTAL NAS
PENSACOLA FL
6/3/2005
TETRA TECH NUS



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0605-E027

June 3, 2005

Commander, Southern Division
Naval Facilities Engineering Command
ATTN: Mr. Bill Hill (Code ES31)
2155 Eagle Drive
North Charleston, South Carolina 29406

Reference: Clean Contract No. N62467-94-D-0888
Contract Task Order No. 0367

Subject: Final Sampling and Analysis Plans
for Site Characterization at Installation Restoration Sites 44, 45, and 46,
Naval Air Station Pensacola, Pensacola, Florida

Dear Mr. Hill:

Tetra Tech NUS, Inc. (TtNUS) is pleased to submit one hardcopy of the Final Sampling and Analysis Plan (including the Final Health and Safety Plan) for Site Characterization for each of the above-referenced sites. A compact disc (CD) containing these documents has also been included in this delivery. Comments on the draft documents were received from the United States Environmental Protection Agency (USEPA) and Florida Department of Environmental Protection (FDEP). These comments and the response to them are provided below:

USEPA Comment 1:

The only comment we have concerns the plan for Site 44. In this plan, the new proposed monitoring well locations displayed on Figure 3-2 are well placed if the source is found to be the Wash Rack Area or the UST location, which most probably will be the case. However, if the Flammable Storage Area is found to be contaminated in the soil investigation, it would be prudent to install a well directly downgradient perhaps 75 or 100 feet away.

RESPONSE:

If the soil investigation indicates that the Flammable Storage Area is contaminated, at least one well will be installed directly downgradient at 75 to 100 feet away.

FDEP Comment 1:

Surface Soil Sampling Plan: The Phase I approach proposed in this section is adequate for its intent. Phase II sampling locations should be placed to accurately represent the conditions of the site. When using 95% UCL as a remedial alternative for the surface soil it is important to have a data set that accurately represents the conditions at the site. When calculating the data the Department recommends using Florida Upper Confidence Limit (FLUCL).

RESPONSE:

The Phase II sampling locations will be placed to accurately represent site conditions, and FLUCL will be used to calculate the data.



Mr. Bill Hill
Commander, Southern Division
Naval Facilities Engineering Command
June 3, 2005

Page 2 of 2

Hardcopies and CDs of the Final Sampling and Analysis Plan for each of the sites have been forwarded to members of the NAS Pensacola Tier 1 Team as specified in the NAS Pensacola Partnering Team Document Delivery List. If you have any questions regarding these documents, or require further information, please contact me at (904) 385-9899.

Sincerely,

A handwritten signature in cursive script that reads "Gerald Walker".

Gerald Walker, P.G.
Task Order Manager

GW/bc/tko

Enclosures (1 paper copy + 1 CD)

c: Greg Fraley, USEPA (1 copy, 1 CD)
Tracie Vaught, FDEP (1 copy, 2 CDs)
Greg Campbell, NASP (2 copy, 2 CDs)
Allison Harris, Ensafe (1 copy, 1 CD)
Greg Wifley, CCI (1 CD)
Brian Caldwell, TtNUS (1 CD)
TtNUS file, Tallahassee (1 CD)
Ms. D Humbert (cover letter only)
Mr. Mark Perry (1 unbound, 1 CD)

**Sampling and Analysis Plan
for
Site Characterization at
Installation Restoration Site 44
(Former UST Site 3221 SW)**

Naval Air Station Pensacola
Pensacola, Florida



**Southern Division
Naval Facilities Engineering Command
Contract Number N62467-94-D-0888
Contract Task Order 0367**

June 2005

**SAMPLING AND ANALYSIS PLAN
FOR
SITE CHARACTERIZATION AT INSTALLATION RESTORATION SITE 44
(FORMER UST SITE 3221 SW)**

**NAVAL AIR STATION PENSACOLA
PENSACOLA, FLORIDA**

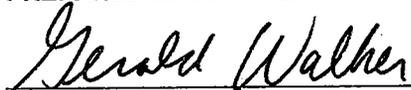
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Southern Division
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**Submitted by:
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**CONTRACT NO. N62467-94-D-0888
CONTRACT TASK ORDER 0367**

JUNE 2005

PREPARED UNDER THE SUPERVISION OF:



**GERALD WALKER, PG
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TETRA TECH NUS, INC.
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APPROVED FOR SUBMITTAL BY:



**DEBRA M. HUMBERT
PROGRAM MANAGER
TETRA TECH NUS, INC.
PITTSBURGH, PENNSYLVANIA**

PROFESSIONAL CERTIFICATION

**Sampling and Analysis Plan for Site Characterization at Installation Restoration Site 44 (Former
UST Site 3221 SW)
Naval Air Station Pensacola, Pensacola, Florida**

This Sampling and Analysis Plan was prepared under the direct supervision of the undersigned geologist using geologic and hydrogeologic principles standard to the profession at the time the report was prepared. If conditions are determined to exist that differ from those described, the undersigned geologist should be notified to evaluate the effects of additional information on the assessment described in this report. This report was developed specifically for the referenced site and should not be construed to apply to any other site.



Brian Caldwell, P.G.
Florida License No. 1330

6/01/05
Date

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
PG CERTIFICATION	iii
ACRONYMS	vii
1.0 INTRODUCTION.....	1-1
1.1 FACILITY BACKGROUND	1-1
1.2 PURPOSE OF THE SAP	1-3
1.3 SITE DESCRIPTION AND HISTORY	1-3
1.4 REGULATORY SETTING.....	1-6
1.5 REPORT ORGANIZATION.....	1-7
2.0 PREVIOUS INVESTIGATIONS	2-1
2.1 CONTAMINATION ASSESSMENT	2-1
3.0 TECHNICAL APPROACH.....	3-1
3.1 OVERVIEW.....	3-1
3.2 SAMPLING AND ANALYSIS PLAN.....	3-1
4.0 FIELD OPERATIONS	4-1
4.1 DECONTAMINATION	4-1
4.2 WASTE HANDLING.....	4-1
4.3 SOIL SAMPLING	4-1
4.4 GROUNDWATER SAMPLING	4-1
4.5 WATER LEVEL MEASUREMENTS	4-2
4.6 AQUIFER TESTING	4-2
4.7 SAMPLE HANDLING.....	4-3
4.7.1 Sample Containers, Preservation, Holding Times, and Analyses	4-3
4.7.2 Sample Documentation, Packaging, and Shipping	4-3
4.8 DATA QUALITY REQUIREMENTS.....	4-3
4.8.1 Laboratory Analyses and Quality Assurance/Quality Control Samples.....	4-3
4.8.2 Data Reduction, Validation, and Reporting	4-4
5.0 INVESTIGATION-DERIVED WASTE MANAGEMENT	5-1
6.0 SITE CHARACTERIZATION REPORT.....	6-1
7.0 PROJECT SCHEDULE	7-1
REFERENCES.....	R-1
<u>APPENDICES</u>	
A HEALTH AND SAFETY PLAN FOR THE REMEDIAL INVESTIGATION AT SITE 44 NAS PENSACOLA, PENSACOLA FL	

FIGURES

<u>NUMBER</u>		<u>PAGE</u>
1-1	Site Location Map	1-2
1-2	Vicinity Aerial Map.....	1-4
1-3	Site Features Map.....	1-5
3-1	Proposed Soil Boring Locations.....	3-2
3-2	Proposed Monitoring Well Locations	3-6

TABLES

<u>NUMBER</u>		<u>PAGE</u>
3-1	Summary of Soil Analytical Requirements, Fixed-Base Laboratory.....	3-4
3-2	Summary of Groundwater Analytical Requirements.....	3-9
4-1	Frequency of Field Quality Control Samples	4-4

ACRONYMS

ABB-ES	ABB Environmental Services, Inc.
AR	Administrative Record
ARAR	Applicable or Relevant and Appropriate Requirements
bgs	Below Ground Surface
°C	Degrees Celsius
CAR	Contamination Assessment Report
CCI	CH2MHILL Constructors, Inc.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLEAN	Comprehensive Long-term Environmental Action Navy
CLP	Contract Laboratory Program
CTL	Cleanup Target Level
CTO	Contract Task Order
DPT	Direct-push Technology
EDB	Ethylene Dibromide
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FL-PRO	Florida Petroleum Range Organics
GCTL	Groundwater Cleanup Target Level
GPS	Global Positioning System
HASP	Health and Safety Plan
HCl	Hydrochloric Acid
HNO ₃	Nitric Acid
HSA	Hollow-Stem Auger
IDW	Investigation-derived Waste
IR	Installation Restoration
mg/kg	Milligrams per Kilogram
mL	Milliliter
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NAM	Naval Aviation Museum
NAS	Naval Air Station
NAVFAC EFD SOUTH	Southern Division, Naval Facilities Engineering Command
NELAP	National Environmental Laboratory Accreditation Program
NFA	No Further Action

ACRONYMS (CONTINUED)

NTU	Nephelometric Turbidity Unit
oz	Ounce
PAH	Polynuclear Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PCE	Tetrachloroethene
PVC	Polyvinyl Chloride
RBCA	Risk-Based Corrective Action
RCRA	Resource Conservation and Recovery Act
RG	Remedial Goal
SAP	Sampling and Analysis Plan
SAR	Site Assessment Report
SARA	Superfund Amendments and Reauthorization Act
SCTL	Soil Cleanup Target Level
SDG	Sample Delivery Group
SOP	Standard Operating Procedure
SPLP	Synthetic Precipitation Leaching Procedure
SVOC	Semivolatile Organic Compound
TAL	Target Analyte List
TCE	Trichloroethene
TCL	Target Compound List
TRPH	Total Recoverable Petroleum Hydrocarbon
TtNUS	Tetra Tech NUS, Inc.
UCL	Upper Confidence Limit
UST	Underground Storage Tank
µg/L	micrograms per Liter
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

1.0 INTRODUCTION

Tetra Tech NUS, Inc., (TtNUS), under contract to the Department of Navy, Southern Division, Naval Facilities Engineering Command (NAVFAC EFD SOUTH) is submitting this Sampling and Analysis Plan (SAP) to complete a Site Characterization Investigation at Installation Restoration (IR) Site 44 (Former Underground Storage Tank [UST] Site 3221 SW; hereinafter referred to as Site 44) at Naval Air Station (NAS) Pensacola, Pensacola, Florida. This SAP was prepared under the Comprehensive Long-term Environmental Action Navy (CLEAN) III Contract Number N62467-94-D-0888, Contract Task Order (CTO) 0367.

1.1 FACILITY BACKGROUND

NAS Pensacola is located in Escambia County, in Florida's northwest coastal area, approximately five miles west of the Pensacola City limits. The approximately 5,000-acre installation was constructed in the 1800's. Prior to construction, the facility was undeveloped and sparsely vegetated. Land use at NAS Pensacola consists of various military housing, training, and support facilities as well as large industrial complexes for major repairs and refurbishment of aircraft engines and frames. Additional details on the NAS Pensacola facility, including geology, hydrogeology, and ecology, may be found in the facility Administrative Record (AR). Site 44 is located in the southern half of the facility (see Figure 1-1 for site location).

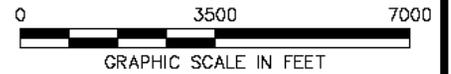
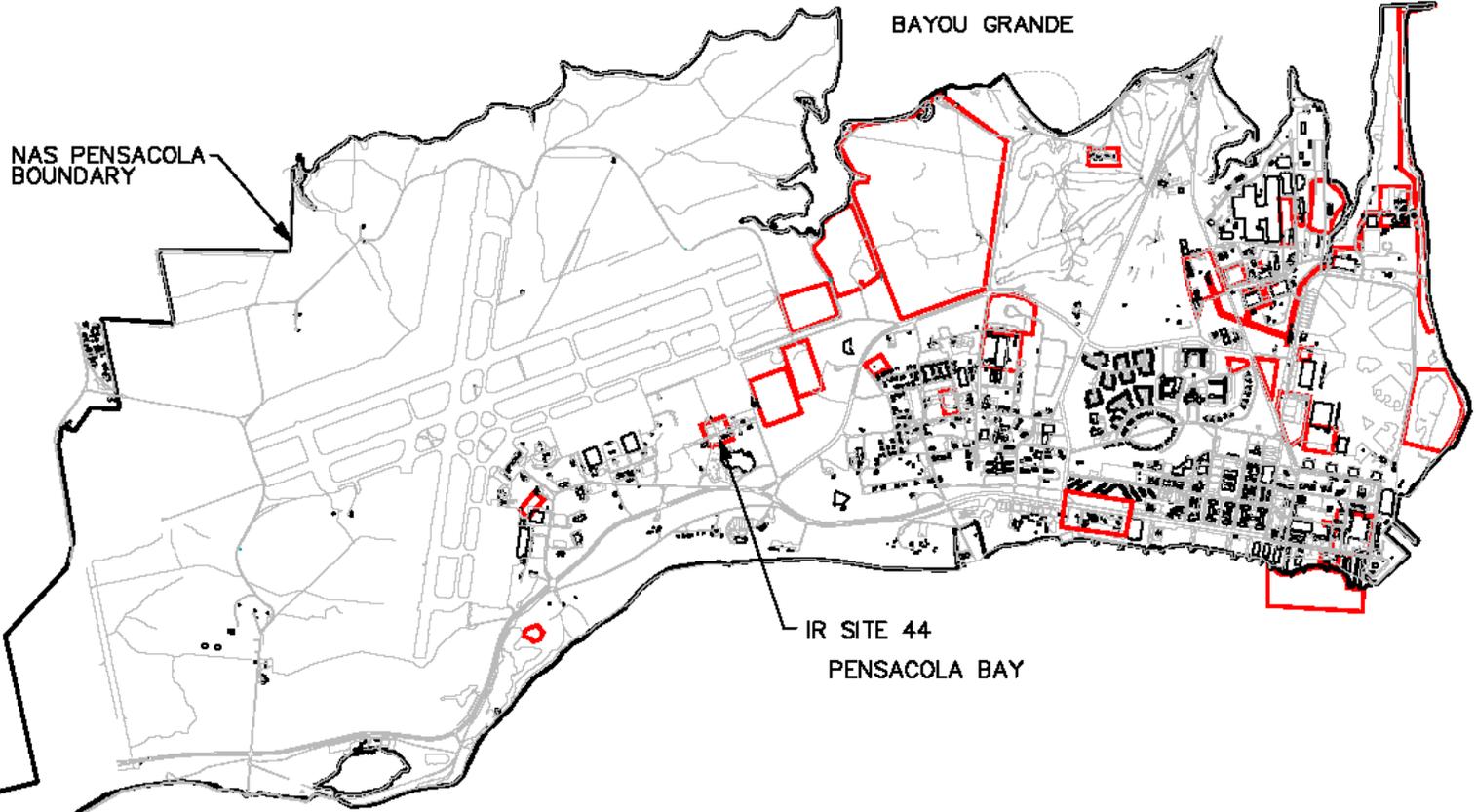
Based on the previous subsurface investigations conducted at NAS Pensacola, including Geraghty and Miller, Inc. (1984, 1986), Ecology and Environment, Inc. (1991) and ABB Environmental Services, Inc. (1993), the shallow stratigraphy at the facility consists of, in descending order (for the purpose of this SAP, shallow is defined as 0 to 100 feet below ground surface [bgs]):

- An approximately 50-foot thick upper unit comprised of fine to medium - grained quartz sand with abundant shell material and localized thin layers of silty clay.
- An approximately 15 foot thick, blue to green marine clay that is laterally persistent across the facility and serves as an aquitard, inhibiting groundwater movement between the units above and below it.
- An underlying unit comprised of a complex mosaic of fine to coarse marine and fluvial sands with localized marine and fluvial clays.

This investigation focuses on the uppermost unit described. Further information regarding the geology at NAS Pensacola can be found in the AR.

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SITE LOCATION MAP
IR SITE 44
SITE CHARACTERIZATION INVESTIGATION
NAS PENSACOLA
PENSACOLA, FLORIDA

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OWNER NO. 0000	
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CTO 0367

Rev. 1
06/01/05

1.2 PURPOSE OF THE SAP

This SAP serves as a guide for the site characterization investigation activities to be conducted at Site 44. This plan documents the procedures for field activities and sample analyses. The SAP specifies the sampling protocol and procedures for data collection and sample analysis, sample locations, frequency of samples to be collected, sample designations, sample handling, sampling equipment, and handling of investigation-derived waste (IDW). This plan was prepared in accordance with the TtNUS Corporate Quality Assurance Program Manual, dated January 1, 2001, and the TtNUS Florida Regional Quality Assurance Program Manual, dated October 9, 2002.

The field activities for the site characterization investigation will include the collection of samples from surface soil, subsurface soil, and groundwater for submission to a National Environmental Laboratory Accreditation Program (NELAP)-certified laboratory for analysis. The data collected during the investigation will be used in preparing a Site Characterization Report.

1.3 SITE DESCRIPTION AND HISTORY

Site 44 is located immediately north of the Naval Aviation Museum (NAM), which is at the northwest corner of Taylor Road and Radford Boulevard (see Figure 1-1 for the regional site location, Figure 1-2 for a 2001 aerial vicinity view with site boundaries, and Figure 1-3 for site features). The boundaries as shown in Figure 1-2 are presumptive only and are based on prior investigation results. The site proper is located to the immediate southwest of Building 3221, which is used by the NAM staff to refurbish aircraft used for display within the museum. The surface cover for the site is a mix of grass, asphalt, concrete, and tree cover. The north-central portion of the site is covered with cement tarmac; the northwest portion is an asphalt-covered storage area for various aircraft parts and is bounded to the west by a wooded area; the northeast portion abutting Building 3221 is an asphalt parking area; and the southern portion is grass-covered with an unpaved access road trending southwest-northeast through it. An overhead power line runs through the northern portion of the site, trending southwest-northeast coincident with the southeast face of Building 3221. An underground water line enters the site from the central northern portion, terminating in a fire hydrant connection.

Outside the southwest end of Building 3221 is a wash rack area used for the cleaning of aircraft parts during refurbishment. According to preliminary interviews, only Simple Green (a biodegradable surfactant agent) has been used to clean parts. Surface drainage from this area flows to a small ditch located on the southeast edge of the tarmac; normal rainfall is directed from this ditch to a stormwater infall, but when aircraft parts washing is being conducted a diverter switch is activated to direct the flow to a sanitary sewer infall, where it is transported to the NAS Pensacola Industrial Wastewater Treatment Plant.

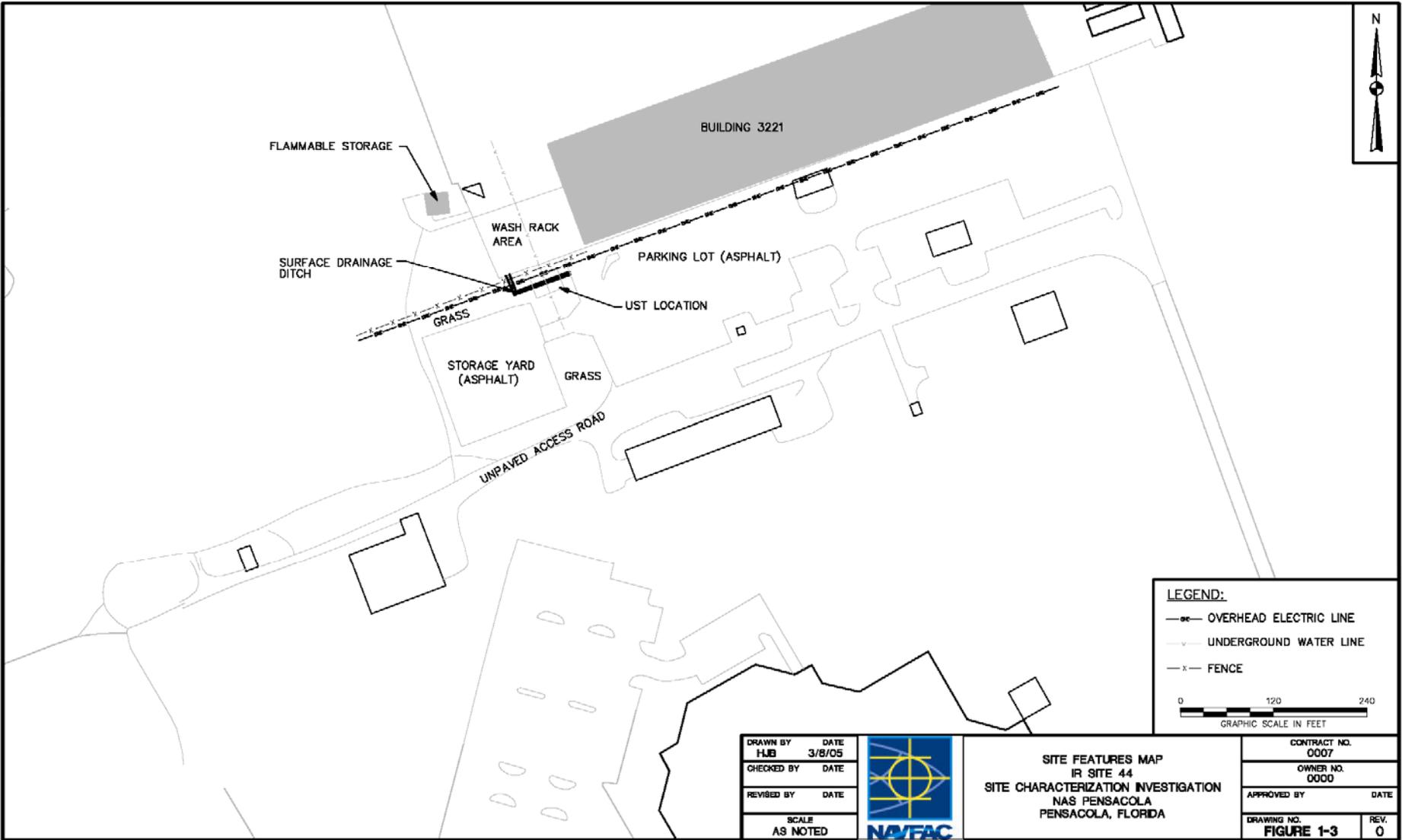


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VICINITY AERIAL MAP
 IR SITE 44
 SITE CHARACTERIZATION INVESTIGATION
 NAS PENSACOLA
 PENSACOLA, FLORIDA

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SITE FEATURES MAP
 IR SITE 44
 SITE CHARACTERIZATION INVESTIGATION
 NAS PENSACOLA
 PENSACOLA, FLORIDA

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FIGURE 1-3	0

A Contamination Assessment Report (CAR) was prepared by ABB Environmental Services, Inc. (ABB-ES) as part of an UST investigation that was conducted in 1992 (ABB-ES, 1993). A single 1000 gallon UST was installed in 1967 just off the tarmac on the southwest corner of Building 3221. This UST was reportedly used to store PD-680 (a petroleum distillate). In 1992, the UST was removed and replaced (in the same location) with a new single 1000 gallon UST that is reportedly used to store waste oil. As part of the contamination assessment, 10 monitoring wells were installed to the southwest of Building 3221 and sampled as part of this investigation. Three of the 10 groundwater samples collected at the site contained detectable concentrations of trichloroethene (TCE), ranging from 4 to 25 micrograms per liter ($\mu\text{g/L}$), and one of the samples contained tetrachloroethene (PCE) at 4 $\mu\text{g/L}$. Surface and subsurface soil media was only analyzed for Total Recoverable Petroleum Hydrocarbons (TRPHs) and metals associated with the State of Florida UST program.

Because the site soil and groundwater did not exceed state UST guideline concentrations for petroleum constituents, it was proposed that a No Further Action (NFA) status be granted under the auspices of that program (ABB-ES, 1993). As a result of the detection of chlorinated solvents in groundwater, the Navy transferred this site to the IR Program for further assessment.

UST Site 19 is located to the immediate east of Site 44. A fuel oil UST of unknown capacity was closed by removal in 1994. Soil collected from the excavation indicated the presence of total xylenes and PCE above Florida Department of Environmental Protection (FDEP) Soil Cleanup Target Levels (SCTLs). A single monitoring well that was installed in the tank excavation area yielded benzene at a concentration exceeding the FDEP Groundwater Cleanup Target Levels (GCTLs). TtNUS completed a site assessment report (SAR) for this site in 2003. As part of this investigation, 19 direct push technology (DPT) soil borings were completed and five additional monitoring wells installed and sampled. The results of the investigation indicated concentrations of petroleum constituents in soil were less than SCTLs, free product was not present in soil or groundwater, and benzene remained above the GCTL in the old tank excavation area. A natural attenuation monitoring plan under the Florida UST program is currently implemented for groundwater at the site.

1.4 REGULATORY SETTING

The Navy IR Program was designed to identify and abate or control contaminant migration resulting from past operations at naval installations, with the goal of expediting and improving environmental response actions while protecting human health and the environment. The IR program is conducted in accordance with Section 120 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986

and Executive Order 12580. CERCLA requires that federal facilities comply with the act, both procedurally and substantively. Site 44, therefore is being investigated under CERCLA requirements.

1.5 REPORT ORGANIZATION

The SAP is organized into eight sections. Below is a list of the sections and a brief description of their purpose:

- Section 1.0 – Presents the purpose, site description, and regulatory setting for the Remedial Investigation at NAS Pensacola.
- Section 2.0 – Summarizes previous investigations.
- Section 3.0 – Presents the site-specific investigation discussion.
- Section 4.0 – Presents the investigative methodology for conducting the assessment.
- Section 5.0 – Addresses the waste resulting from investigation activities.
- Section 6.0 – Discusses the investigative results of reporting of the assessment.
- Section 7.0 – Presents the sampling and analysis, and reporting schedule of operations for the site assessment activities.
- References – Lists all references used in preparing this planning document.
- The Health and Safety Plan is provided in Appendix A.

2.0 PREVIOUS INVESTIGATIONS

This chapter summarizes previous investigations performed at Site 44 at NAS Pensacola. Previous investigations include a UST contamination assessment finalized in 1993.

2.1 CONTAMINATION ASSESSMENT

Site 44 was the site of a former 1000 gallon UST, installed in 1967, that was used to store PD-680 (a petroleum distillate). The UST was removed in 1992 and replaced with a new 1000 gallon UST that is used to store waste oil. During tank removal activities, two soil samples were collected from the excavation and analyzed for TRPH; the result [57 milligrams per kilogram (mg/kg)] was slightly above the state screening level of 50 mg/kg (ABB-ES, 1993).

Pursuant to state regulations, discrete soil samples were then collected and five monitoring wells installed to assess the conditions at the site. Soil samples were analyzed for Organic Vapor Analyzer headspace and total metals; groundwater samples were analyzed for used oil constituents. Water level measurements in site wells indicated that shallow groundwater flows from southwest to northeast. Groundwater results indicated that concentrations of petroleum contaminants of concern were below state standards. However, PCE was detected at concentrations slightly exceeding the state guidance concentration (3 ug/L) in four wells downgradient of the UST. Because of the low concentrations of PCE, the site investigation was allowed to continue in accordance with the FDEP petroleum program. As a result, five additional monitoring wells and four additional soil borings were installed at the site and sampled. Soil results indicated that petroleum contamination was not significant in that media. PCE was not detected in groundwater samples located in the area of the former UST, but was present in a single well (MW-8) approximately 100 feet downgradient of the former UST. TCE was also not detected in wells near the former UST, but it was present in three downgradient wells (MW-7, MW-9, and MW-10) at concentrations of 4, 5, and 25 ug/L, respectively. TCE concentrations increased to the northeast, in a downgradient direction away from the former UST area.

The source of chlorinated solvents in groundwater was not determined during the investigation, but was speculated in the CAR to be associated with the flammable storage area located west of Building 3221 and adjacent to the tarmac (see Figure 1-3). Groundwater samples have not been collected since the contamination assessment fieldwork in 1992. Soil samples were not analyzed for chlorinated solvent constituents during the investigation (ABB-ES, 1993), therefore no definitive statement can be made regarding impacts to that media.

3.0 TECHNICAL APPROACH

3.1 OVERVIEW

The primary objective of this sampling plan is to characterize the nature and magnitude of chemical constituents within soil and groundwater at Site 44. Inherent in the primary objective is that if the magnitude of any detected chemical constituent exceeds a pre-prescribed screening level, the extent of that constituent above that screening level will be delineated. In this case, the pre-prescribed screening levels are the Florida SCTLs (for soil) and Florida GCTLs (for groundwater). These Cleanup Target Levels (CTLs) are listed in Florida Administrative Code (FAC) 62-777, and are not repeated here. In addition to the CTLs, inorganic parameters detected in soil and groundwater will be compared to their respective background concentration ranges. Soil and groundwater samples will be collected for both on-site and off-site laboratory analysis. Field activities, such as sampling and monitor well installation, will be conducted in accordance with the Health and Safety Plan (HASP; presented as Appendix A) and the FDEPs Standard Operating Procedures (SOPs) for Field Activities (FDEP, 2004). In the event the FDEP SOPs do not address a specific task, TtNUS will defer to the TtNUS Corporate SOPs (TtNUS, 2004).

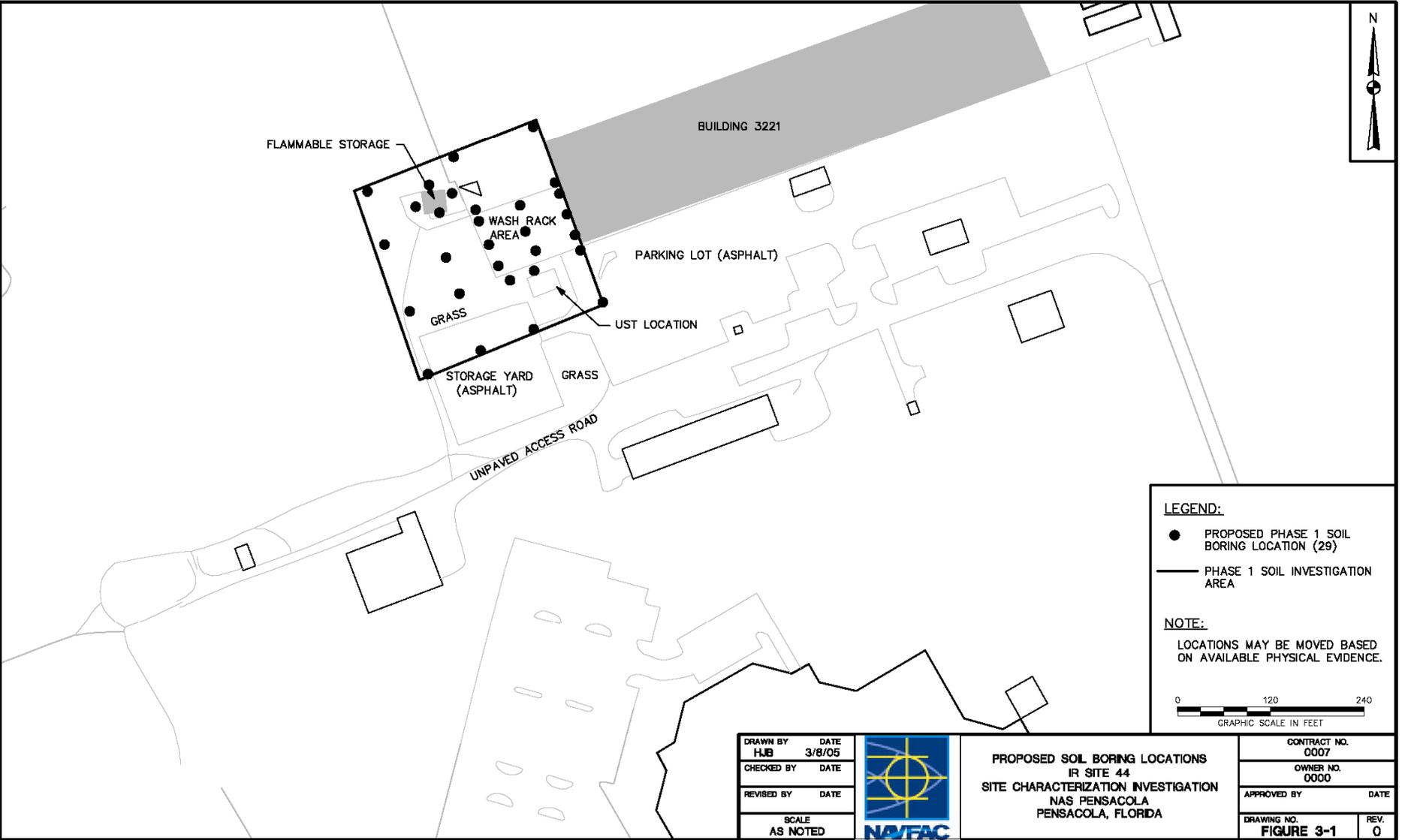
3.2 SAMPLING AND ANALYSIS PLAN

Surface Soil Sampling Plan

Because of the limited soil constituents analyzed as part of the previous investigation, soil media has not been characterized with respect to the volatile constituents detected in shallow groundwater during the contamination assessment. Because of the lack of a known source, and that the Site 44 boundaries shown on Figure 1-2 are presumptive only, it is proposed that a larger area initially be investigated for soil contamination. It is also proposed that the surface soil investigation be conducted using a mobile laboratory for field screening. Use of a larger investigation area and a mobile laboratory will maximize coverage and minimize the time to meet the primary objective of the investigation. The area proposed for the soil investigation is shown on Figure 3-1. The initial sampling will consist of the collection of 29 surface soil samples at the locations shown on Figure 3-1. These locations include two targeted for the former/current UST area and the ditch that drains the wash rack area, nine within the wash rack area including one at the well location that exhibited the highest previous volatile organic compound (VOC) detection in shallow groundwater, four targeting the flammable storage area, and the remainder spaced evenly across the soil investigation area. These locations are estimated only, and may be changed in the field based on the mobile laboratory results.

The surface soil samples will be collected from the ground surface to a depth of 1 foot bgs or 1 foot below the base of pavement surface using either a hand-auger or a DPT soil-sampling device (e.g., Geoprobe[®] system). In the case of pavement at the surface, the pilot hole will be advanced using mechanical means such as a concrete boring device. The sampling methodology will be compliant with FDEP's Global

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LEGEND:

- PROPOSED PHASE 1 SOIL BORING LOCATION (29)
- PHASE 1 SOIL INVESTIGATION AREA

NOTE:

LOCATIONS MAY BE MOVED BASED ON AVAILABLE PHYSICAL EVIDENCE.

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GRAPHIC SCALE IN FEET

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PROPOSED SOIL BORING LOCATIONS
IN SITE 44
SITE CHARACTERIZATION INVESTIGATION
NAS PENSACOLA
PENSACOLA, FLORIDA

CONTRACT NO. 0007	
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DRAWING NO. FIGURE 3-1	REV. 0

FORM CADD NO. S31V-BH.DWG -- REV 1 -- 9/10/98

Risk-Based Corrective Action (RBCA) Rule 62-780, including section 62-780.600(5) (c) 1, which describes how to conduct soil sampling when the remedial approach for the surface soil is proposed to be 95% Upper Confidence Limit (UCL).

All surface soil samples collected at the site will be analyzed in the field in a mobile laboratory for limited VOCs and chlorinated solvents (benzene, toluene, ethylbenzene, total xylenes, naphthalene, PCE, TCE 1,1,1- trichloroethane, 1,1,1-TCE, and 1,1-dichloroethane). The soil samples will be collected in accordance with FS 3100, Surface Soil Sampling (FDEP, 2004). The laboratory analytical method to be used by the mobile laboratory is the United States Environmental Protection Agency (USEPA) Modified 8260, and is specified in Table 3-1.

The mobile laboratory results will be used to determine the necessity for surface soil sampling at locations in addition to those shown on Figure 3-1. The results will indicate whether areas of VOCs above residential SCTLs (if present) can be sufficiently delineated and are constrained within the proposed soil investigation area, or whether the area needs to be expanded to complete delineation. If the former is the case, then additional locations within the investigation area may be sampled to increase the delineation resolution. If the latter is the case, the investigation area will be appropriately expanded and additional locations will be sampled to complete delineation.

Once delineation of VOCs above residential SCTLs in surface soil is sufficiently complete using mobile laboratory analyses, the three locations with the highest concentrations of VOCs will be resampled, and the samples sent to a Contract Laboratory Program (CLP)-certified, fixed-base laboratory for normal turnaround analysis for a full Target Analyte List/Target Compound List (TAL/TCL) scan [TCL VOCs, TCL semivolatile organic compounds (SVOCs), TCL Pesticides/polychlorinated biphenyls (PCBs), TCL polynuclear aromatic hydrocarbons (PAHs), and TAL Metals] plus ethylene dibromide (EDB) and TRPHs. In addition to the sample volume collected for the TAL/TCL scan, an additional sample volume will be collected from each of the three locations. This additional volume will be submitted to the laboratory for Synthetic Precipitation Leaching Procedure (SPLP) analysis for TCL VOCs. The laboratory analytical methods to be used are specified in Table 3-1.

Subsurface Soil Sampling Plan

Full characterization of the soil media at Site 44 will also require the collection of subsurface soil samples. It is proposed that subsurface soil samples be collected from the same locations using the same delineation approach as that described for surface soil samples. The initial sampling will consist of the collection of 29 subsurface soil samples at the locations shown on Figure 3-1. Based on available data, it is expected the shallow water table will be encountered within 6 feet bgs. Therefore, a single subsurface soil sample from the 2 feet to 6 feet bgs interval will be collected at each of the boring locations.

TABLE 3-1
SUMMARY OF SOIL ANALYTICAL REQUIREMENTS
SAMPLING AND ANALYSIS PLAN FOR
SITE CHARACTERIZATION AT SITE 44
NAVAL AIR STATION PENSACOLA
PENSACOLA, FLORIDA

Analysis	Analytical Method	Sample Mass ⁽¹⁾	Bottleware	Preservation	Holding Time ⁽²⁾
Chlorinated solvents, benzene, toluene, ethylbenzene, xylenes	USEPA Modified 8260 (mobile laboratory)	20 grams	Widemouth jar (approx. 100 grams)	Cool to 4°C	14 days
CLP TCL VOCs	USEPA SW-846 8260B	20 grams	Widemouth jar (approx. 100 grams)	Cool to 4°C	14 days
CLP TCL PAHs	USEPA SW-846 3310 or 8270C SIM	100 grams	Widemouth jar (approx. 200 grams)	Cool to 4°C	14 days until extraction, 40 days for analysis
CLP TCL SVOCs	USEPA SW-846 8270C	100 grams	Widemouth jar (approx. 200 grams)	Cool to 4°C	14 days until extraction, 40 days for analysis
CLP TCL PCBs	USEPA SW-846 8082	100 grams	Widemouth jar (approx. 200 grams)	Cool to 4°C	14 days until extraction, 40 days for analysis
CLP TCL Pesticides	USEPA SW-846 8081A	100 grams	Widemouth jar (approx. 200 grams)	Cool to 4°C	14 days until extraction, 40 days for analysis
CLP TAL Inorganics	USEPA SW-846 6010B	10 grams	Widemouth jar (approx. 100 grams)	Cool to 4°C	Within 180 days
EDB	USEPA SW-846 8260	15 grams	Widemouth jar (approx. 100 grams)	Cool to 4°C	14 days
TRPHs	FDEP FL-PRO (Florida-specific method)	100 grams	Widemouth jar (approx. 200 grams)	Cool to 4°C	28 days
SPLP – TCL VOCs	USEPA SW-846 1312/8260B	20 grams	Widemouth jar (approx. 100 grams)	Cool to 4°C	14 days

NOTES:

- 1 Sample mass may vary based on laboratory requirements.
- 2 Holding times are measured from the date/time of sample collection.

CLP = Contract Laboratory Program
EDB = Ethylene dibromide
TRPH = Total Recoverable Petroleum Hydrocarbons Procedure
PCB = Polychlorinated Biphenyl
FL-PRO = Florida Petroleum Range Organics

TAL = Target Analyte List
VOC = Volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon Compound
SIM = Selected Ion Monitoring
TCL = Target Compound List

oz = ounce
°C = Degrees Celsius
SPLP = Synthetic Precipitation Leaching
SVOC = Semivolatile Organic Compound

The soil borings will be advanced and samples collected using either a hand-auger or a DPT soil-sampling device (e.g., Geoprobe® system). As with the surface soil samples, all subsurface soil samples collected at the site will be analyzed in the field in a mobile laboratory for VOCs and limited chlorinated solvents ((benzene, toluene, ethylbenzene, total xylenes, naphthalene, PCE, TCE 1,1,1- trichloroethane, 1,1,1-TCE, and 1,1-dichloroethane). All subsurface soil samples will be collected in accordance with FDEP SOPs, including FS 3200, Subsurface Soil Sampling (FDEP, 2004). The laboratory analytical method to be used by the mobile laboratory is USEPA Modified 8260, and is specified in Table 3-1.

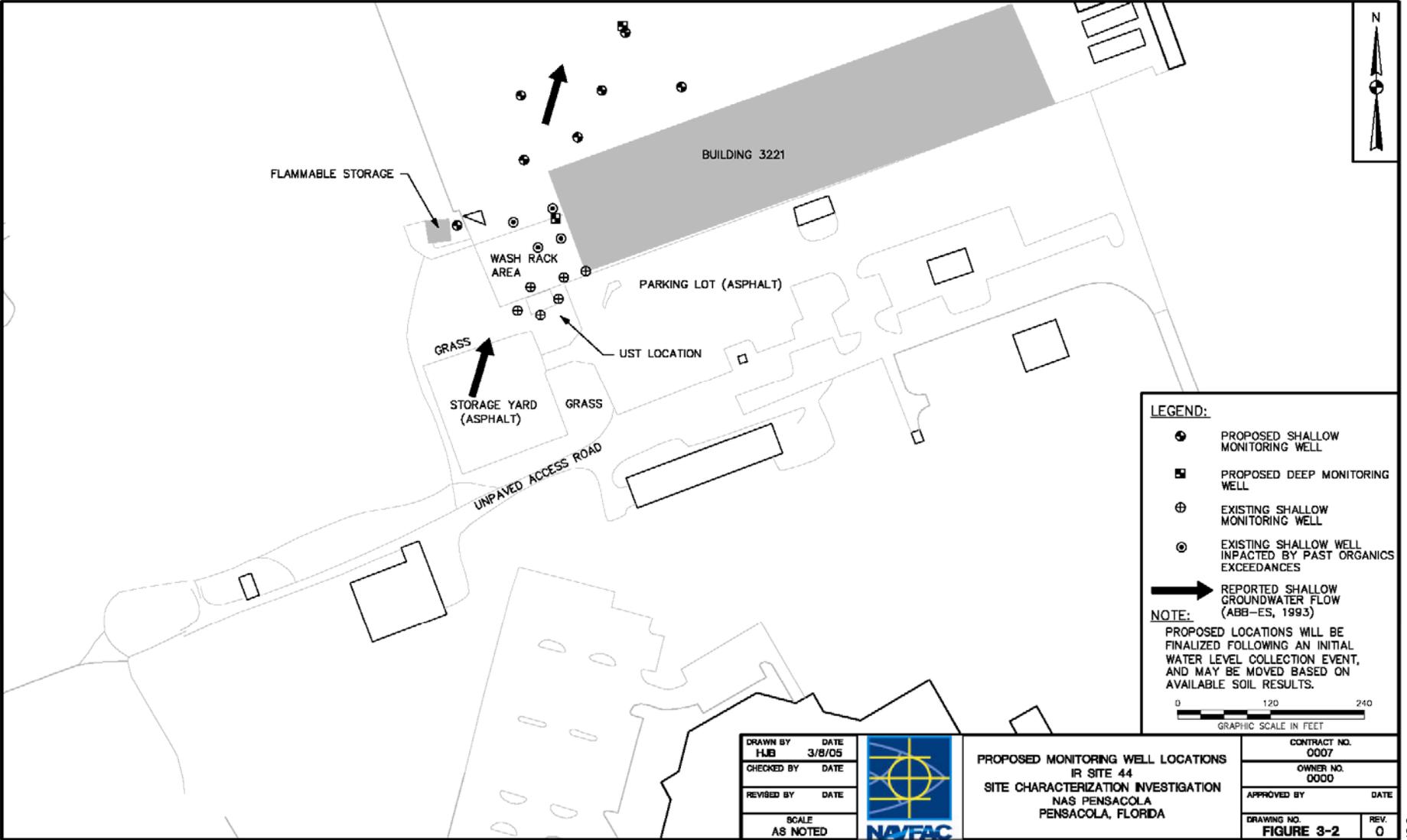
Using the mobile laboratory results, the delineation will be completed in the same manner as that proposed for surface soil. Following delineation, the three locations with the highest concentrations of VOCs will be resampled, and the samples sent to a CLP-certified, fixed-base laboratory for normal turnaround analysis for a full TAL/TCL scan (TCL VOCs, TCL SVOCs, TCL Pesticides/PCBs, TCL PAHs, and TAL Metals), plus EDB and TRPHs. In addition to the sample volume collected for the TAL/TCL scan, an additional sample volume will be collected from each of the three locations. This additional volume will be submitted to the laboratory for SPLP analysis for TCL VOCs. The laboratory analytical methods to be used are specified in Table 3-1.

Monitoring Well Installation Plan

Records indicate that 10 wells have been installed and remain at the site as a result of the contamination assessment investigation (ABB-ES, 1993). An initial site reconnaissance will be conducted to determine the existence and condition of these wells, in the event that they may be used in this site investigation. Following confirmation of a wells existence, the wellhead riser will be opened so that the well can equilibrate to atmospheric pressure, and the total depth of the well and water level inside the well casing will then be measured. Plots will be made of the calculated water levels to confirm reported and/or estimated flow directions, and locations of proposed monitoring wells will be finalized. TtNUS will then install a new permanent monitoring well network including both shallow and deep monitoring wells.

The number and location of monitoring wells to be installed will depend partly on the results of the soil investigation. The well network will include an upgradient well(s), source area well(s), side-gradient well(s), and downgradient well(s). These wells are installed at locations sufficient to delineate the potential groundwater impacts associated with elevated VOCs in site soil. In addition to the soil investigation results, previous groundwater results will be incorporated into design of the monitoring well network. For the purpose of the planning within this SAP, a monitoring network will to be installed to address the VOC exceedances already noted in shallow groundwater. Assuming that all 10 pre-existing monitoring wells will be suitable for sampling, 7 shallow and 2 deep monitoring wells will be installed at

PLT BTH 5/1/03 8:45:30 AM 3/10/05 10:41:00 AM



LEGEND:

- PROPOSED SHALLOW MONITORING WELL
- PROPOSED DEEP MONITORING WELL
- ⊕ EXISTING SHALLOW MONITORING WELL
- ⊙ EXISTING SHALLOW WELL IMPACTED BY PAST ORGANICS EXCEEDANCES
- ➔ REPORTED SHALLOW GROUNDWATER FLOW (ABB-ES, 1993)

NOTE:
 PROPOSED LOCATIONS WILL BE FINALIZED FOLLOWING AN INITIAL WATER LEVEL COLLECTION EVENT, AND MAY BE MOVED BASED ON AVAILABLE SOIL RESULTS.

0 120 240
 GRAPHIC SCALE IN FEET

DRAWN BY	DATE
HJB	3/8/05
CHECKED BY	DATE
REVISD BY	DATE
SCALE	AS NOTED



PROPOSED MONITORING WELL LOCATIONS
 IR SITE 44
 SITE CHARACTERIZATION INVESTIGATION
 NAS PENSACOLA
 PENSACOLA, FLORIDA

CONTRACT NO. 0007	
OWNER NO. 0000	
APPROVED BY	DATE
DRAWING NO. FIGURE 3-2	REV. 0

FORM CAD3D NO. SDIV-BLDWG - REV 1 - 5/10/98

the proposed locations shown on Figure 3-2. These provide upgradient shallow wells, a deep source well at the location of the highest VOC detection in shallow groundwater, side and downgradient shallow wells, and a downgradient deep monitoring well, all referenced from the highest previous VOC detection in shallow groundwater. The shallow wells will be installed to an approximate depth of 15 feet bgs with a 10-foot well screen bracketing the water table, and the deep wells will be installed to an approximate depth of 50 feet bls, with the bottom of a 10 foot well screen targeted to terminate approximately 5 feet or less above the top of the uppermost clay unit below the surficial sands. The wells will be installed using hollow-stem auger (HSA) or Rotosonic® drilling methods. The monitoring wells will be installed and constructed in accordance with NAVFAC EFD SOUTH and FDEP guidance documents.

All monitoring wells will be of a 2-inch nominal diameter, and will be constructed of Schedule 40 polyvinyl chloride (PVC). Wells will be developed through overpurging after installation. Development will not be initiated before a 24-hours set time for the final annular grouting has elapsed.

Groundwater Sampling Plan

Following the well installation program, groundwater samples will be collected from all pre-existing and newly-installed wells to assess the current groundwater conditions. Based on the full execution of the initial monitoring well installation plan, it is anticipated that 17 shallow monitoring wells and 2 deep monitoring wells will be sampled. The well locations anticipated to be sampled are those shown on Figure 3-2.

Prior to collecting groundwater samples, water levels (piezometric head) and total well depths will be measured at all wells. The wells will then be purged, using a peristaltic pump [or a submersible pump in the event that water levels fall below a depth equivalent to one atmosphere of ambient pressure (approximately 25 feet bgs)]. All purging will be conducted using a low-flow quiescent technique. Purging completion will be determined in accordance with FS 2212, Well Purging Techniques (FDEP, 2004).

The groundwater samples collected from on-site wells will be analyzed for a full CLP TAL/TCL analytical scan, plus EDB and TRPH. The list of the analyses for each groundwater sample is provided in Table 3-2. Groundwater samples will be collected in accordance with FS 2220, Groundwater Sampling Techniques (FDEP, 2004).

Background Determinations for Inorganic Parameters

Background of an inorganic parameter for the purpose of this SAP is defined as that range of concentrations present due to non-anthropogenic conditions, and is important when comparing site analytical data. Background for TAL inorganic constituents in soil and groundwater will be determined through the evaluation of samples collected from appropriate site-specific locations upgradient of any known disposal areas (presently undetermined) and/or geostatistical analysis of base-wide data.

Geostatistical analysis of the background data will be consistent with the US Navy Environmental Background Analysis guidance document (US Navy, 2004).

Global Positioning System (GPS) Surveying and Aquifer Testing

The horizontal location of each monitor well and soil boring location will be surveyed with a hand-held GPS unit. Top-of-casing elevations for each of the monitor wells will be surveyed by TtNUS personnel using traditional surveying methods. All top-of-casing elevations will be referenced to a previously surveyed existing well. Aquifer testing will be conducted on three shallow and two deep wells, and will consist of both rising and falling head slug tests.

TABLE 3-2

**SUMMARY OF GROUNDWATER ANALYTICAL REQUIREMENTS
SAMPLING AND ANALYSIS PLAN FOR
SITE CHARACTERIZATION INVESTIGATION AT SITE 44
NAVAL AIR STATION PENSACOLA
PENSACOLA, FLORIDA**

Analysis	Analytical Method	Sample Volume ⁽¹⁾	Bottleware	Preservation	Holding Time ⁽²⁾
CLP TCL VOCs	SW-846 8260B	3 x 40 mL	Glass, plastic screw cap, Teflon™-lined	Cool to 4°C, HCl to pH<2	14 days from sampling to analysis
CLP TCL PAHs	USEPA SW-846 3310 or 8270C SIM	3 x 1000 mL	Glass, plastic screw cap, Teflon™-lined	Cool to 4°C	7 days until extraction, 40 days for analysis
CLP TCL SVOCs	USEPA SW-846 8270C	3 x 1000 mL	Glass, plastic screw cap, Teflon™-lined	Cool to 4°C	7 days until extraction, 40 days for analysis
CLP TCL PCBs	USEPA SW-846 8082	1000 mL	Glass, plastic screw cap, Teflon™-lined	Cool to 4°C	7 days until extraction, 40 days for analysis
CLP TCL Pesticides	USEPA SW-846 8081A	1000 mL	Glass, plastic screw cap, Teflon™-lined	Cool to 4°C	14 days until extraction, 40 days for analysis
CLP TAL Inorganics	USEPA SW-846 6010B	200 mL	Plastic, plastic screw cap, Teflon™-lined	Cool to 4°C, HNO ₃ to pH<2	Within 180 days
EDB	504.1	3 x 40 mL	Glass, plastic screw cap, Teflon™-lined	Cool to 4°C, sodium thiosulfate needed to react with residual chlorine	14 days
TRPHs	FDEP FL-PRO	3 x 1000 mL	Glass, plastic screw cap, Teflon™-lined	Cool to 4°C, HCl to pH<2	28 days

NOTES:

1 Sample volume may vary based on laboratory requirements.

2 Holding times are measured from the date/time of sample collection.

°C = Degrees Celsius

mL = milliliter

HNO₃ = Nitric Acid

SVOC = Semivolatile Organic Compound

TRPH = Total Recoverable Petroleum Hydrocarbons

EDB = Ethylene dibromide

CLP = Contract Laboratory Program

VOC = Volatile Organic Compound

TCL = Target Compound List

PCB = Polychlorinated Biphenyl

HCl = Hydrochloric Acid

PAH = Polynuclear Aromatic Hydrocarbon

TAL = Target Analyte List

4.0 FIELD OPERATIONS

This section describes the procedures for conducting the project-specific field investigation activities to be performed during the Site 44 sampling. Field operation activities to be performed include mobilization of equipment, waste handling, soil sampling, groundwater sampling, water level measurements, and surveying/aquifer testing. The individual activities are described below.

4.1 DECONTAMINATION

Decontamination of major equipment and sampling equipment will be in general accordance with FC 1000, Cleaning/Decontamination Procedures (FDEP, 2004).

4.2 WASTE HANDLING

Limited solid wastes in the form of soil or sediment are expected to be generated during this field program. All solid and liquid wastes generated will be collected in 55-gallon drums and will be handled in accordance with applicable state and federal regulations.

4.3 SOIL SAMPLING

Surface soil samples will be collected using a stainless steel hand auger, and subsurface soil samples will be collected using a DPT core barrel. The sample aliquots will be collected at the prescribed intervals as detailed in Section 3.2 of this SAP. Each sample aliquot will be screened immediately with a flame ionization detector, then homogenized in a stainless steel bowl and transferred to sample bottles. The samples will be labeled, preserved on ice, and transported to the laboratory. All portions of the sampling equipment used in sample collection will be decontaminated before each use using standard decontamination procedures. Equipment rinse blanks will be collected from the decontaminated sampler at the prescribed frequency. All soil will be collected using the procedures as specified in FS 3100, Surface Soil Sampling and FS 3200, Subsurface Soil Sampling (FDEP, 2004).

4.4 GROUNDWATER SAMPLING

Groundwater samples will be collected using low-flow purging techniques (discharge typically a rate of less than 1 liter per minute) and sampling with a peristaltic pump (shallow wells) or potentially a submersible pump (deep wells) and Teflon™ tubing dedicated to each well. All groundwater samples will be collected using the procedures specified in FS 2200, Groundwater Sampling (FDEP, 2004). If light non-aqueous phase liquid is detected in any monitoring well prior to sampling, a groundwater sample will not be collected at that location.

Prior to groundwater sample collection, the monitoring wells will be purged to remove stagnant water in the well casing. Both purging and sampling operations will attempt to be conducted at a flow rate that results in a groundwater turbidity measurement of 10 nephelometric turbidity units (NTUs) or less (inherent turbidity will be minimized to the greatest extent possible using low flow techniques; individual well conditions and local geology may preclude meeting the 10 NTU criteria).

Groundwater samples collected using a peristaltic pump for analysis other than VOCs will be collected using an in-line transfer apparatus to prevent sample contact with the peristaltic pump and placed in precleaned containers supplied by the contract laboratory. The sample aliquot for VOC analysis will be collected last by slowly pulling the Teflon™ tubing out of the well to minimize agitation of the water in the monitoring well and then transferring the contents of the tubing to a VOC vial. Groundwater samples collected using a submersible pump will be collected directly from the dedicated delivery tubing. After collection, all samples will be placed in a cooler, chilled with ice, and shipped under chain-of-custody protocol to the off-site laboratory for analysis.

4.5 WATER LEVEL MEASUREMENTS

Two synoptic rounds of water-level measurements will be conducted at the site as part of the groundwater sampling event to provide information regarding groundwater flow patterns and gradients. The first round will be completed using existing monitoring wells at the initiation of the field investigation effort. The second round will be completed following installation of all monitoring wells as part of the groundwater sampling event. Water levels will be measured from all existing and available monitoring wells at the site. Water-level measurements will be completed within the shortest time possible on the same day, and no sooner than 24 hours after a significant precipitation event to minimize the precipitation effects on the data sets.

In each monitoring well, water-level measurements will be made by obtaining a direct reading from a measuring tape with an attached water interface probe. Measurement will be recorded to the nearest 0.01 foot and referenced to a top of casing notch or north side of the well casing. The measurement tape will be properly decontaminated prior to conducting the measurement event and between each monitoring well.

4.6 AQUIFER TESTING

Aquifer testing will be conducted on three shallow and two deep wells, and will consist of both rising and falling head tests. These consist of inserting a decontaminated inert “slug” of known volume into the well and recording the response of the water level to the insertion (using a digital data logger such as an InSitu Troll® or similar device set on a logarithmic recording scale) until equilibration with static conditions

is re-established (falling head slug test). Following completion of the falling head test, the slug is withdrawn and the water level recorded until water level equilibration from the slug withdrawal is reached (rising head slug test). Analyses of the slug tests will be performed using a commercially available software such as AQTESOLV[®].

4.7 SAMPLE HANDLING

4.7.1 Sample Containers, Preservation, Holding Times, and Analyses

The sample containers, preservatives, holding times, and specific analyses are provided in Tables 3-1 and 3-2. Pre-preserved, certified-clean bottleware will be supplied by the subcontracted laboratory.

4.7.2 Sample Documentation, Packaging, and Shipping

Matrix-specific sample logsheets will be maintained for each sample collected. In addition, sample collection information will be recorded in bound field notebooks or specific field forms. Samples will be packaged and shipped according to FS 1000, General Sampling Procedures (FDEP, 2004).

4.8 DATA QUALITY REQUIREMENTS

4.8.1 Laboratory Analyses and Quality Assurance/Quality Control Samples

The analytical methods to be used are presented in Tables 3-1 and 3-2. The analytical data packages will be Naval Energy and Environmental Support Activity Level E (USEPA Level III). Each sample delivery group (SDG) of the analytical data will receive a full validation.

Rinsate blanks will be collected to determine whether the source water or the decontamination process have introduced contaminants to the environmental samples collected. Trip blanks will be collected to determine if contaminants are introduced in the samples during the sample shipping process. Field duplicates will be a single sample split into two portions for a determination of the precision of the sampling and analysis method employed.

The field sampling team will provide the appropriate additional sample volume as prescribed by the laboratory requirements for laboratory duplicate and matrix spike samples. The additional sample aliquots required for analysis of matrix spike/matrix spike duplicates (MS/MSD) will be collected with a frequency of 1 per 20 samples per matrix. Table 4-1 provides the frequency of collection for field quality control samples.

TABLE 4-1

**FREQUENCY OF FIELD QUALITY CONTROL SAMPLES
SAMPLING AND ANALYSIS PLAN FOR
SITE CHARACTERIZATION AT SITE 44
NAVAL AIR STATION PENSACOLA
PENSACOLA, FLORIDA**

Type Of Samples	Frequency
Rinsate Blank	1 per media per sample event
Trip Blank (VOCs only)	1 per sample shipment
Field Duplicate	1 per 20 samples/matrix
MS/MSD	1 per 20 samples/matrix

4.8.2 Data Reduction, Validation, and Reporting

Formal data validation will be performed as part of this work. The data will be evaluated for, but not limited to precision, accuracy, representativeness, completeness, and comparability parameters using the USEPA CLP National Validation Functional Guidelines for Organic Data Review (USEPA, 1999), the USEPA CLP National Validation Functional Guidelines of Inorganic Data Review (USEPA, 1994), and the TINUS SOPs.

5.0 INVESTIGATION-DERIVED WASTE MANAGEMENT

IDW generated during the Site Characterization activities will be managed in accordance with the procedures described in the NAS Pensacola IDW Plan. This document emphasizes management of all IDW in an environmentally responsible manner consistent with the CERCLA program, Resource Conservation and Recovery Act (RCRA) requirements, and the base's standard procedures. The objectives of the IDW management plan are

- Management of IDW in a manner that prevents contamination of uncontaminated areas (by IDW) and that is protective of human health and the environment.
- Minimization of IDW, thereby reducing costs and the potential for human or ecological exposure to contaminated materials.
- Compliance with federal and state requirements that are Applicable or Relevant and Appropriate Requirements (ARARs).

6.0 SITE CHARACTERIZATION REPORT

The Site Characterization Report will include appropriate sections concerning site background, investigation activities, physical characteristics, nature and extent of contamination, aquifer characteristics, and conclusions and recommendations.

The Site Characterization Report will be issued in draft to NAVFAC EFD SOUTH for initial review. The final report will be issued upon incorporation of review comments. If the recommendations of the Site Characterization Report are that the site should be elevated to Operable Unit status, the final edition of the Site Characterization Report will not be completed. Instead all data previously collected will be incorporated into the human health and ecological risk assessments and the results will be published in a draft final and final RI report.

7.0 PROJECT SCHEDULE

The site characterization activities and report are currently scheduled as follows:

- Final Sampling and Analysis Plan Approval: 29 April 2005
- Investigation Fieldwork: 30 April 2005 through 29 October 2005
- Final Site Characterization Report: 16 March 2006

This schedule is based on assumed site conditions and will be updated monthly to reflect actual progress during the project.

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APPENDIX A
HEALTH AND SAFETY PLAN
SITE 44

**Health and Safety Plan
for the
Site Characterization Report
for
Site 44
Located at
NAVAL AIR STATION PENSACOLA
PENSACOLA, FLORIDA**



**Southern Division
Naval Facilities Engineering Command
Contract Number N62467-94-D-0888
Contract Task Order 0367**

June 2005

HEALTH AND SAFETY PLAN
FOR THE
SITE CHARACTERIZATION REPORT
FOR
SITE 44
LOCATED AT
NAVAL AIR STATION PENSACOLA
PENSACOLA, FLORIDA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION-NAVY (CLEAN) CONTRACT

Submitted to:
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Naval Facilities Engineering Command
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North Charleston, South Carolina 29406

Submitted by:
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CONTRACT NUMBER N62467-94-D-0888
CONTRACT TASK ORDER 0367

MARCH 2005

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TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
1.0 INTRODUCTION	1-1
1.1 KEY PROJECT PERSONNEL AND ORGANIZATION	1-1
1.2 SITE INFORMATION AND PERSONNEL ASSIGNMENTS	1-3
2.0 EMERGENCY ACTION PLAN	2-1
2.1 INTRODUCTION	2-1
2.2 EMERGENCY PLANNING	2-1
2.3 EMERGENCY RECOGNITION AND PREVENTION	2-2
2.3.1 Recognition	2-2
2.3.2 Prevention	2-2
2.4 SAFE DISTANCES AND PLACES OF REFUGE	2-3
2.5 EVACUATION ROUTES AND PROCEDURES	2-3
2.6 EMERGENCY ALERTING AND ACTION/RESPONSE PROCEDURES	2-3
2.7 EMERGENCY CONTACTS	2-4
2.8 ROUTE TO HOSPITAL	2-5
2.9 DECONTAMINATION PROCEDURES/EMERGENCY MEDICAL TREATMENT ..	2-8
2.10 INJURY/ILLNESS REPORTING.....	2-8
3.0 SITE BACKGROUND.....	3-1
3.1 SITE DESCRIPTION	3-1
3.2 SITE 44	3-1
4.0 SCOPE OF WORK.....	4-1
5.0 TASKS/HAZARDS/ASSOCIATED CONTROL MEASURES SUMMARIZATION.....	5-1
5.1 GENERAL SAFE WORK PRACTICES	5-1
5.2 DRILLING (HSA/DPT) SAFE WORK PRACTICES.....	5-2
5.2.1 Before Drilling	5-2
5.2.2 During Drilling	5-3
5.2.3 After Drilling	5-4
6.0 HAZARD ASSESSMENT.....	6-1
6.1 CHEMICAL HAZARDS	6-1
6.2 PHYSICAL HAZARDS	6-3
6.3 NATURAL HAZARDS	6-3
6.3.1 Insect Bites and Stings	6-3
6.3.2 Snakes of Florida	6-6
6.3.3 Inclement Weather	6-8
6.3.4 Heat Strain Symptoms	6-8
7.0 HAZARD MONITORING-TYPES AND ACTION LEVELS	7-1
7.1 INSTRUMENTS AND USE	7-1
7.1.1 Photoionization Detector or Flame Ionization Detector	7-1
7.1.2 Hazard Monitoring Frequency	7-2
7.2 INSTRUMENT MAINTENANCE AND CALIBRATION	7-2

TABLE OF CONTENTS (CONT'D)

<u>SECTION</u>		<u>PAGE</u>
8.0	TRAINING/MEDICAL SURVEILLANCE REQUIREMENTS.....	8-1
8.1	INTRODUCTORY/REFRESHER/SUPERVISORY TRAINING.....	8-1
8.1.1	Training Requirements for TtNUS and Subcontractor Personnel.....	8-1
8.2	SITE-SPECIFIC TRAINING.....	8-1
8.3	MEDICAL SURVEILLANCE.....	8-2
8.3.1	Medical Surveillance Requirements for TtNUS and Subcontractor Personnel.....	8-2
8.3.2	Medical Data Sheet.....	8-2
8.4	SUBCONTRACTOR EXCEPTION.....	8-2
9.0	SPILL PREVENTION AND CONTAINMENT PROGRAM.....	9-1
9.1	SCOPE AND APPLICATION.....	9-1
9.2	POTENTIAL SPILL AREAS.....	9-1
9.3	CONTAINMENT AREAS.....	9-1
9.3.1	IDW.....	9-2
9.3.2	Flammable/POL Storage.....	9-2
9.4	MATERIALS HANDLING.....	9-3
9.5	LEAK AND SPILL DETECTION.....	9-3
9.6	PERSONNEL TRAINING AND SPILL PREVENTION.....	9-3
9.7	SPILL PREVENTION AND CONTAINMENT EQUIPMENT.....	9-4
9.8	SPILL CONTAINMENT/CONTROL RESPONSE PLAN.....	9-4
10.0	SITE OPERATIONS AND CONTROL.....	10-1
10.1	WORK ZONES.....	10-1
10.1.1	Exclusion Zone.....	10-1
10.1.2	Contamination Reduction Zone.....	10-2
10.1.3	Support Zone.....	10-3
10.2	SAFE WORK PERMITS.....	10-3
10.3	SITE MAP.....	10-4
10.4	BUDDY SYSTEM.....	10-4
10.5	MATERIAL SAFETY DATA SHEET (MSDS) REQUIREMENTS.....	10-6
10.6	COMMUNICATION.....	10-6
10.7	SITE VISITORS.....	10-6
10.8	SITE SECURITY.....	10-7
11.0	CONFINED SPACE ENTRY.....	11-1
12.0	MATERIALS AND DOCUMENTATION.....	12-1
12.1	MATERIALS TO BE POSTED OR MAINTAINED AT THE SITE.....	12-1
13.0	GLOSSARY.....	13-1

ATTACHMENTS

- I INJURY/ILLNESS PROCEDURE AND REPORT FORM
- II STANDARD OPERATING PROCEDURE FOR UTILITY LOCATING AND EXCAVATION CLEARANCE
- III EQUIPMENT INSPECTION CHECK LIST
- IV SAFE WORK PERMITSV
- V MEDICAL DATA SHEET

TABLE OF CONTENTS (Cont'd)

TABLES

<u>NUMBER</u>		<u>PAGE</u>
2-1	Emergency Contacts.....	2-5
5-1	Tasks/Hazards/Control Measures	5-5
6-1	Chemical, Physical and Toxicological Data	6-2
6-2	Heat Strain Symptoms	6-8

FIGURES

<u>NUMBER</u>		<u>PAGE</u>
2-1	Route to Navy Hospital Pensacola	2-6
2-2	Route to Baptist Hospital	2-7
2-3	Emergency Response Protocol	2-9
7-1	Documentation of Field Calibration.....	7-3
8-1	Site-Specific Training Documentation.....	8-4
10-1	Safe Work Permit.....	10-5

1.0 INTRODUCTION

The Health and Safety Plan (HASP) has been written to encompass site activities that will be conducted at Site 44 at the Naval Air Station (NAS) in Pensacola, Florida as part of Contract Task Order (CTO) 0367. The CTO directing this investigation is part of an overall effort conducted under the Comprehensive Long-Term Environmental Action Navy (CLEAN III) administered through the U.S. Navy Southern Division Naval Facilities Engineering Command (NAVFAC) as defined under Contract Number N62467-94-D-0888. Onsite activities performed by Tetra Tech NUS (TtNUS) and subcontractors will comply with the provisions of this Health and Safety Plan.

This HASP must be present at the site during the performance of site activities. The requirement for these documents to be on-site is established in the Occupational Safety and Health Administration (OSHA) "Hazardous Waste Operations and Emergency Response" (HAZWOPER) standard 29 CFR 1910.120.

This HASP has been developed using the latest available information regarding known or suspected chemical contaminants and potential physical hazards associated with the proposed work and site. The HASP will be modified if new information becomes available. Changes to the HASP will be made with the approval of the TtNUS Task Order Manager (TOM). The TOM will notify affected personnel of changes. A Site Safety Follow-up Report must be completed to document changes to the HASP.

1.1 KEY PROJECT PERSONNEL AND ORGANIZATION

This section defines responsibility for site safety and health for TtNUS employees and subcontractor personnel engaged in onsite activities. These persons will be the primary point of contact for questions regarding safety and health procedures and the selected control measures addressed in this HASP.

- The TtNUS TOM is responsible for the overall direction and implementation of this HASP.
- The FOL manages field activities, executes the work plan, and enforces safety procedures as applicable to the work plan.
- The Project Health and Safety Officer (PHSO) is responsible for developing this HASP in accordance with applicable OSHA regulations. Specific responsibilities include:
 - Providing information regarding site contaminants and physical hazards.

- 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 appropriate training and medical surveillance certificates.
 - Providing standard work practices to minimize potential injuries and exposures associated with hazardous waste site work.
 - Modify this HASP when necessary.
- The Site Safety Officer (SSO) supports site activities by advising the TOM on the aspects of health and safety on site. These duties may include the following:
 - Coordinate health and safety activities with the FOL.
 - Select, inspect, implement, and maintain personal protective equipment.
 - Establish work zones and control points.
 - Implements air-monitoring program for onsite activities.
 - Verify training and medical status of onsite personnel status in relation to site activities.
 - Implements hazard communication, respiratory protection, and other associated safety and health programs as necessary
 - Coordinates emergency services.
 - Provides site specific training for onsite personnel.
 - Investigates accidents and injuries (see Attachment I Illness/Injury Procedure and Report Form)
 - Provides input to the PHSO regarding the need to modify, this HASP, or other applicable health and safety associated documents as per site-specific requirements.
 - Compliance with the requirements of this HASP are monitored by the SSO and coordinated through the TtNUS CLEAN Health and Safety Manager (HSM).

Note: In some cases one person may be designated responsibilities for more than one position. For example, at NAS Pensacola the FOL may also be responsible for the SSO duties. This action will be performed only as credentials, experience, and availability permits.

1.2 SITE INFORMATION AND PERSONNEL ASSIGNMENTS

Site Name: Naval Air Station Pensacola Address: Pensacola, Florida

Navy Engineer-In-Charge (EIC): William Hill Phone Number: (843) 820-7324

NAS Pensacola Environmental Coordinator: Greg Campbell Phone Number: (850) 452-4611 ext. 103

Purpose of Site Visit: This activity is divided into a multi-task operation (see Section 4.0), including soil boring, monitoring well installation, multi media sampling, surveying, and IDW management.

Proposed Dates of Work

<u>DPT drilling and sampling</u>	<u>14 May 05 through 27 Jun 05</u>
<u>Monitoring well drilling and installation</u>	<u>13 Jul 05 through 21 Aug 05</u>
<u>Groundwater sampling</u>	<u>05 Sep 05 through 25 Sep 05</u>
<u>IDW removal</u>	<u>28 Oct 05 and 29 Oct 05</u>

Project Team

TtNUS Management Personnel	Discipline/Tasks Assigned	Telephone
<u>Gerald Walker, P.G.</u>	<u>Task Order Manager (TOM)</u>	<u>(850) 385-9899</u>
<u>Matthew M. Soltis, CIH, CSP</u>	<u>CLEAN Health and Safety Manager</u>	<u>(412) 921-8912</u>
<u>Brian Caldwell</u>	<u>Field Operations Leader (FOL)</u>	<u>(850) 385-9899</u>
<u>TBD</u>	<u>Site Health and Safety Officer (SSO)</u>	<u>_____</u>
<u>James K. Laffey</u>	<u>Project Health and Safety Officer (PHSO)</u>	<u>(412) 921-8678</u>
<u>Thomas Patton</u>	<u>Equipment Manager</u>	<u>(412) 859-4670</u>

Non-TtNUS Personnel	Affiliation/Discipline/Tasks Assigned	Telephone
<u>TBD</u>	<u>Hollow Stem Auger Drilling Subcontractor</u>	<u>_____</u>
<u>TBD</u>	<u>Direct Push Drilling Subcontractor</u>	<u>_____</u>
<u>_____</u>	<u>_____</u>	<u>_____</u>

Hazard Assessment (for purposes of 29 CFR 1910.132) for HASP preparation has been conducted by:

Prepared by: James K. Laffey

TBD - To be determined

2.0 EMERGENCY ACTION PLAN

2.1 INTRODUCTION

This section has been developed as part of a planning effort to direct and guide field personnel in the event of an emergency. In the event of an emergency that cannot be handled by onsite personnel, site personnel will be evacuated to a safe place of refuge and the appropriate emergency response agencies will be notified. It has been determined that the majority of potential emergency situations would be better supported by outside emergency responders. Therefore, TtNUS will not provide emergency response support for significant emergency events beyond the capabilities of onsite response. Workers who are ill or who have suffered a non-serious injury may be transported by site personnel to nearby medical facilities, provided such transport does not aggravate or further endanger the welfare of the injured/ill person. 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 operations, a factor which ensures adequate emergency response time. This emergency action plan conforms to the requirements of OSHA Standard 29 CFR 1910.38(a), as allowed in OSHA 29 CFR 1910.120(l)(1)(ii).

TtNUS personnel will, through necessary services, include initial response measures for incidents such as:

- Incipient fire-fighting support and prevention
- Incipient spill control and containment measures and prevention
- Removal of personnel from emergency situations
- Provision of initial medical support for injury/illness requiring only first-aid level support
- Provision of site control and security measures as necessary

2.2 EMERGENCY PLANNING

From the initial site hazard/risk assessment, injury/illness resulting from exposure to chemical or physical hazards and fire are the most probable emergencies that could occur during site activities. To minimize or eliminate these potential emergency situations, emergency planning activities will include the following (which are the responsibility of the SSO and/or the FOL):

- Coordinating response actions with NAS Pensacola Emergency Services personnel to ensure that TtNUS emergency action activities are compatible with existing facility emergency response procedures.

- Establishing and maintaining information at the project staging area (support zone) for easy access in the event of an emergency. This information will include the following:
 - Chemical Inventory (for substances used onsite), with Material Safety Data Sheets.
 - Onsite personnel medical records (Medical Data Sheets).
 - A logbook identifying personnel onsite each day.
 - Emergency notification phone numbers in site vehicles
- Identifying a chain of command for emergency action.
- Educating site workers to the hazards and control measures associated with planned activities at the site, and providing early recognition and prevention, where possible.

It is the responsibility of the TtNUS FOL to ensure that this information is available and present at the site.

2.3 EMERGENCY RECOGNITION AND PREVENTION

2.3.1 Recognition

Foreseeable emergency situations that may be encountered during site activities will generally be recognizable by worker observation or through air monitoring equipment readings. Through site-specific training, site personnel will have knowledge regarding the signs and symptoms of overexposure to contaminants of concern. This knowledge will assist site personnel in identifying potential emergency situations and to alert personnel of potential hazards. Many of the potential hazards and recommended control measures are discussed in Sections 5.0 and 6.0 of this document. Additionally, early recognition will be supported by periodic site surveys to eliminate conditions that may predispose site personnel or property to an emergency. Site surveys will be conducted at least once a week during the initiation of this effort.

The above actions will provide early recognition for potential emergency situations. Should an incident take place, TtNUS will take defensive and offensive measures to control the situation. However, if the FOL and/or the SSO determine that an incident has progressed to a serious situation, TtNUS will withdraw, and notify appropriate response agencies.

2.3.2 Prevention

TtNUS will minimize the potential for emergencies by following the Health and Safety Guidance Manual and ensuring compliance with the HASP and applicable OSHA regulations. In the event that an activity or operation is covered by more than one of these documents, the most stringent requirement shall apply.

2.4 SAFE DISTANCES AND PLACES OF REFUGE

In the event that the site must be evacuated, personnel will immediately stop activities and report to the TtNUS FOL at the safe refuge area. Safe places of refuge will be determined prior to commencement of site activities and will be conveyed to personnel as part of the daily safety meeting conducted each morning. Upon reporting to the refuge location, personnel will remain there until directed otherwise by the FOL or the on-site Incident Commander of the Emergency Response Team. The FOL or the SSO will take a head count at this location to confirm the location of site personnel. The site logbook will be used to take and record the head count. Ideally, the places of refuge should offer a point for communication.

2.5 EVACUATION ROUTES AND PROCEDURES

An evacuation will be initiated whenever recommended hazard controls are insufficient to protect the health, safety, or welfare of site workers or when acceptable entry conditions within the fiber optic vault are compromised. Once an evacuation is initiated, personnel will proceed immediately to the designated place of refuge, unless doing so would further jeopardize the welfare of workers. In such event, personnel will proceed to a designated alternate location (to be identified) and remain there until further notification from the FOL. The use of these locations as assembly points provides communication and a direction point for emergency services.

Evacuation procedures will be discussed prior to the initiation of work at the site. This shall include identifying primary and secondary evacuation routes and assembly points. Evacuation routes from the site 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) will influence the designation of evacuation routes. As a result, multiple assembly points will be selected at NAS Pensacola, and in the event of an emergency, field personnel will proceed to these points by the most direct route possible without further endangering themselves.

2.6 EMERGENCY ALERTING AND ACTION/RESPONSE PROCEDURES

Since personnel will be working in close proximity of each other, hand signals, voice commands, air horns, and line of site communication will comprise the mechanisms to alert site personnel of an emergency.

If an emergency incident occurs, site personnel will initiate the following procedures:

- Initiate incident alerting procedures (if needed) via hand signals, voice commands, or vehicle horns.

- Describe to the FOL (who will serve as the Incident Commander) what has occurred and as many details as possible. Once personnel are evacuated, incipient response procedures will be enacted to control the situation.

In the event that site personnel cannot control the incident through offensive and/or defensive measures, the FOL and the SSO will enact emergency notification procedure to secure additional outside assistance in the following manner:

- Call 911 and report the emergency
- Give the emergency operator the location of the emergency and a brief description of the incident
- Stay on the phone and follow the instructions given by the operator
- The appropriate agency will be notified and dispatched

If an incident occurs at NAS Pensacola outside of our designated operating areas impacting field personnel, the following procedures are to be initiated:

- Initiate an evacuation (if needed) by voice commands, hand signals, air horns, or two-way radio.
- Proceed to the assembly points as directed by NAS Pensacola personnel.

2.7 EMERGENCY CONTACTS

Prior to performing work at the site, personnel will be thoroughly briefed on the procedures to be followed in the event of an emergency incident. Table 2-1 provides a list of emergency contacts and their corresponding telephone numbers. This table must be posted where it is readily available to site personnel. Facility maps should also be posted showing potential evacuation routes and designated meeting areas.

**TABLE 2-1
EMERGENCY CONTACTS
NAS PENSACOLA**

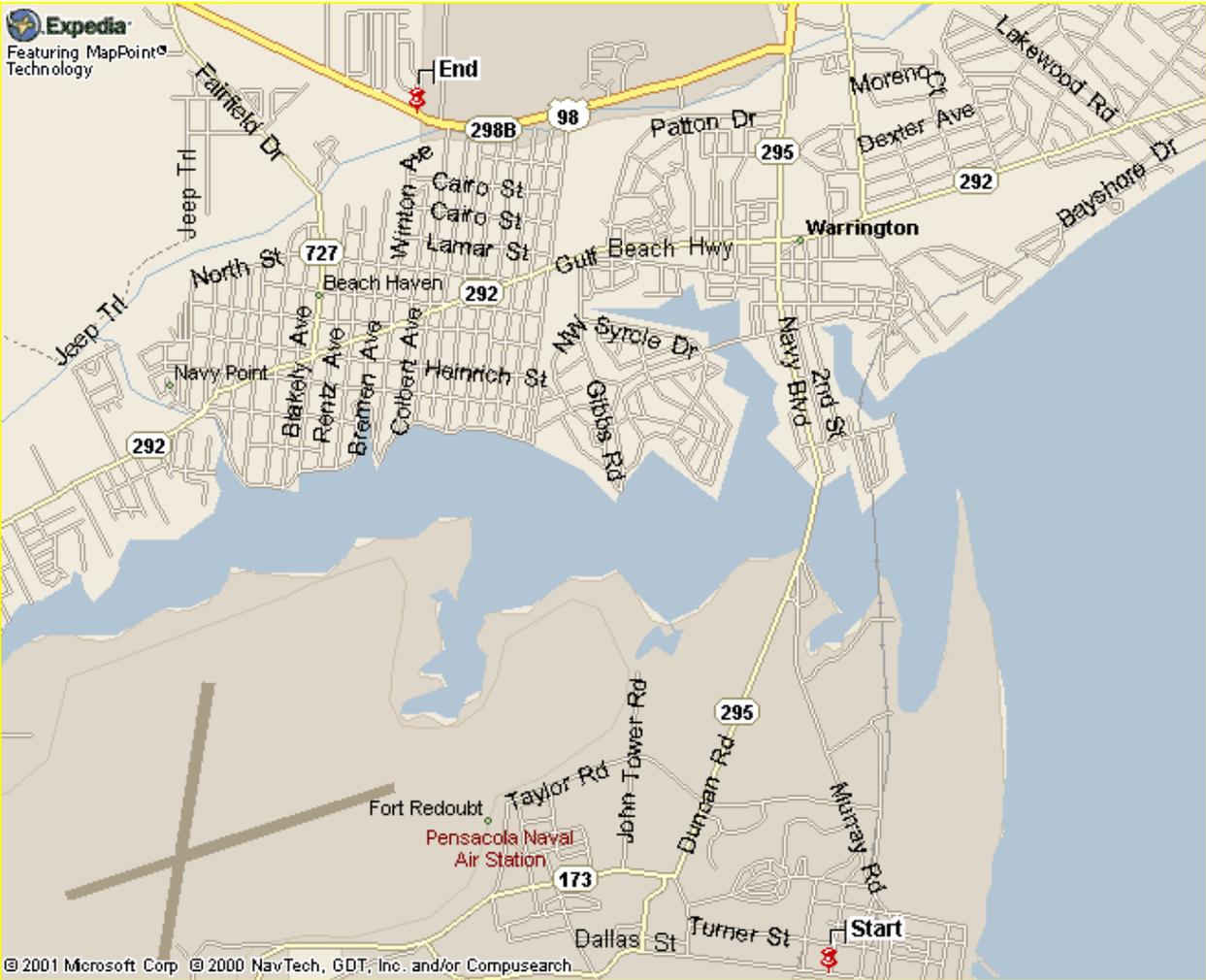
AGENCY	TELEPHONE
EMERGENCY (Police, Fire, and Ambulance)	911
NAS Pensacola – Emergency Dispatch	(850) 452-3333
Navy Engineer-in-Charge, William Hill	(843) 820-7324
Facility Point of Contact , Greg Campbell	(850) 452-4611 ext 103
Navy Hospital	(850) 505-6600
Baptist Hospital	(850) 469-2313)
Chemtrec	(800) 424-9300
National Response Center	(800) 424-8802
Poison Control Center	(800) 222-1222
FL Game and Fresh Water Fish Commission NW Region Office	(850) 265-3676
WorkCare	(800) 229-3674
TtNUS Tallahassee Office	(850) 385-9899
FOL, Brain Caldwell	(850) 385-9899
TOM, Gerry Walker	(850) 385-9899
CLEAN HSM, Matthew M. Soltis, CIH, CSP	(412) 921-8912
Project Health and Safety Officer, James K. Laffey	(412) 921-8678

2.8 ROUTE TO HOSPITALS

Two hospitals could potentially be used during this project depending on the circumstances and extent of the emergency. For emergency situations the Naval Hospital Pensacola (NHP) should be utilized. The hospital is closer to the site and is fully prepared to accept trauma cases as well as potentially chemically contaminated patients. Baptist Hospital will be used for all non-emergency care services. Routes and directions to these hospitals are provided in Figures 2-1 and 2-2, respectively.

FIGURE 2-1

Navy Hospital Pensacola
6000 W. Highway 98
Pensacola, Florida 32512
(850) 505-6600

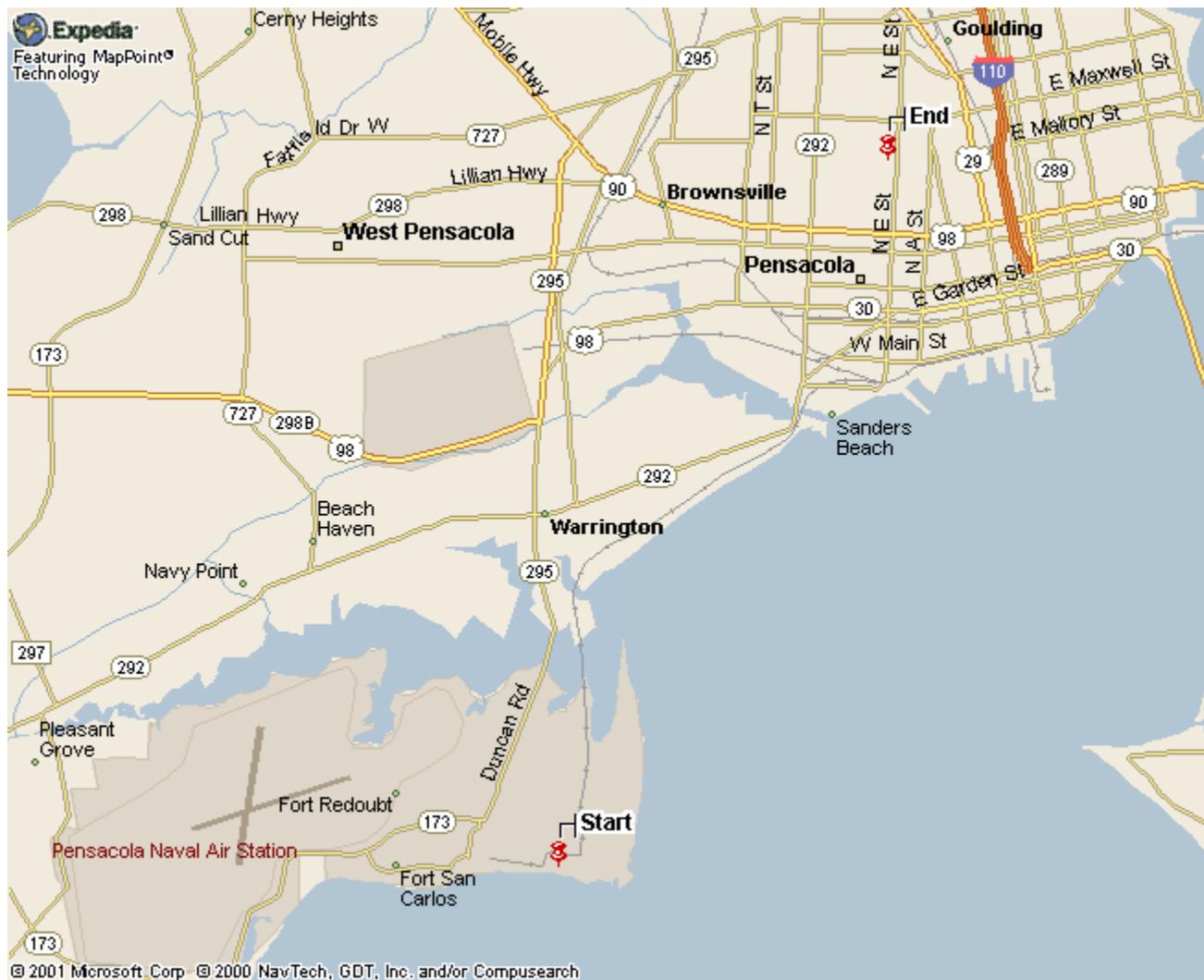


- ❶ Proceed out of Main Gate (Navy Blvd/Rt. 295) heading north towards US Highway 98.
- ❷ Turn left (heading west) on US 98 and proceed approximately 1 mile.
- ❸ Hospital will be on the right (Building 2268).

FIGURE 2-2

Route to Baptist Hospital
1000 West Moreno Blvd.
Pensacola, FL 32508

(850-469-2313)



Directions to this Hospital from the Main Gate of NAS Pensacola are:

- ❶ Proceed out of Main Gate (Navy Blvd/Rt. 295) heading north to Hwy 292.
- ❷ Turn right (heading east) on Hwy 292 until it turns into Garden Street (approx. 3 miles).
- ❸ Take Garden Street to intersection with "E" Street.
- ❹ Turn left onto "E" Street and proceed approximately 1 mile to Hospital on left.

2.9 DECONTAMINATION PROCEDURES/EMERGENCY MEDICAL TREATMENT

During a site evacuation, decontamination procedures will be performed only if doing so does not further jeopardize the welfare of site workers. Decontamination will not be performed if the action that initiates an evacuation would further endanger the lives of workers. However, a situation that would require workers to evacuate without first performing decontamination procedures is unlikely to occur at this site. If the emergency involves suspected exposure to chemicals, follow the steps provided in Figure 2-3.

2.10 INJURY/ILLNESS REPORTING

If TtNUS personnel are injured or develop an illness as a result of working on site, the TtNUS "Injury/Illness Procedure" (Attachment I) must be followed. Following this procedure is necessary for documenting the information obtained at the time of the incident. Also, as soon as possible the Navy Contact must be informed of incidents or accidents that require medical attention.

FIGURE 2-3 EMERGENCY RESPONSE PROTOCOL

The purpose of this protocol is to provide guidance for the medical management of injury situations.

In the event of a personnel injury or accident:

- Rescue, when necessary, employing proper equipment and methods.
- Give attention to emergency health problems -- breathing, cardiac function, bleeding, and shock.
- Transfer the victim to the medical facility designated in this HASP by suitable and appropriate conveyance (i.e. ambulance for serious events)
- Obtain as much exposure history as possible (a Potential Exposure report is attached).
- If the injured person is a Tetra Tech NUS employee, call the medical facility and advise them that the patient(s) is/are being sent and that they can anticipate a call from the WorkCare physician. WorkCare will contact the medical facility and request specific testing which may be appropriate. WorkCare physicians will monitor the care of the victim. Site officers and personnel should not attempt to get this information, as this activity leads to confusion and misunderstanding.
- Call WorkCare at 1-800-455-6155 and enter Extension 109, or follow the voice prompt for after hours and weekend notification and be prepared to provide:
 - Any known information about the nature of the injury.
 - As much of the exposure history as was feasible to determine in the time allowed.
 - Name and phone number of the medical facility to which the victim(s) has/have been taken.
 - Name(s) of the involved Tetra Tech NUS, Inc. employee(s).
 - Name and phone number of an informed site officer who will be responsible for further investigations.
 - Fax appropriate information to WorkCare at (714) 456-2154.
- Contact Corporate Health and Safety Department (Matt Soltis) and Human Resources Manager Marilyn Duffy at 1-800-245-2730.
- As data is gathered and the scenario becomes more clearly defined, this information should be forwarded to WorkCare.

WorkCare will compile the results of the data and provide a summary report of the incident. A copy of this report will be placed in each victim's medical file in addition to being distributed to appropriately designated company officials.

Each involved worker will receive a letter describing the incident but deleting any personal or individual comments. A personalized letter describing the individual findings/results will accompany this

generalized summary. A copy of the personal letter will be filed in the continuing medical file maintained by WorkCare.

FIGURE 2-3 (continued)
WORKCARE
POTENTIAL EXPOSURE REPORT

Name: _____ Date of Exposure: _____
Social Security No.: _____ Age: _____ Sex: _____
Client Contact: _____ Phone No.: _____
Company Name: _____

I. Exposing Agent

Name of Product or Chemicals (if known): _____

Characteristics (if the name is not known)

Solid Liquid Gas Fume Mist Vapor

II. Dose Determinants

What was individual doing? _____
How long did individual work in area before signs/symptoms developed? _____
Was protective gear being used? If yes, what was the PPE? _____
Was their skin contact? _____
Was the exposing agent inhaled? _____
Were other persons exposed? If yes, did they experience symptoms? _____

III. Signs and Symptoms (check off appropriate symptoms)

Immediately With Exposure:

Burning of eyes, nose, or throat Chest Tightness / Pressure
Tearing Nausea / Vomiting
Headache Dizziness
Cough Weakness
Shortness of Breath

Delayed Symptoms:

Weakness Loss of Appetite
Nausea / Vomiting Abdominal Pain
Shortness of Breath Headache
Cough Numbness / Tingling

IV. Present Status of Symptoms (check off appropriate symptoms)

Burning of eyes, nose, or throat Nausea / Vomiting
Tearing Dizziness
Headache Weakness
Cough Loss of Appetite
Shortness of Breath Abdominal Pain
Chest Tightness / Pressure Numbness / Tingling
Cyanosis

Have symptoms: (please check off appropriate response and give duration of symptoms)

Improved: _____ Worsened: _____ Remained Unchanged: _____

V. Treatment of Symptoms (check off appropriate response)

None: _____ Self-Medicating: _____ Physician Treated: _____

3.0 SITE BACKGROUND

3.1 SITE DESCRIPTION

NAS Pensacola is located in Escambia County in the panhandle of Northwest Florida. The installation occupies 8,423 acres of land - 5,800 acres at the main installation (NAS), and 2,623 acres at other area locations including Corry Station, Saufley Field and Outlying Landing Field Bronson.

3.2 SITE 44

Site 44 (Former UST 3221) is located immediately north of the Naval Aviation Museum (NAM), which is at the northwest corner of Taylor Road and Radford Boulevard. The site proper is located to the immediate southwest of Building 3221, which is used by the NAM staff to refurbish aircraft used for display within the museum. The surface cover for the site is a mix of grass, asphalt, concrete, and tree cover. The north-central portion of the site is covered with cement tarmac; the northwest portion is an asphalt-covered storage area for various aircraft parts and is bounded to the west by a wooded area; the northeast portion abutting Building 3221 is an asphalt parking area; and the southern portion is grass-covered with an unpaved access road trending southwest-northeast through it. An overhead power line runs through the northern portion of the site, trending southwest-northeast coincident with the southeast face of Building 3221. An underground water line enters the site from the central northern portion, terminating in a fire hydrant connection.

Outside the immediate southwest corner of Building 3221 is a wash rack used for the cleaning of aircraft parts during refurbishment. According to preliminary interviews, only Simple Green (a biodegradable surfactant agent) has been used to clean parts. Surface drainage from the concrete tarmac in this area flows to a small ditch located on the southeast edge of the tarmac; normal rainfall is directed from this ditch to a stormwater infall, but when aircraft parts washing is being conducted a diverter switch is activated to direct the flow to a sanitary sewer infall (where it is transported to the NAS Pensacola Industrial Wastewater Treatment Plant).

4.0 SCOPE OF WORK

This section discusses the specific tasks that are to be conducted as part of this scope of work as identified by CTO 0367. These tasks are the only ones addressed by this HASP. Any tasks to be conducted outside of the elements listed here will be considered a change in scope requiring modification of this document. The TOM or a designated representative will submit the requested modifications to this document to the HSM.

Specific tasks to be conducted include the following:

- Mobilization/demobilization activities
- Soil borings via Direct Push Technology (DPT)
- Monitoring Well
 - Installation using Hollow Stem Augering (HSA)
 - Development
- Multimedia sampling including
 - Groundwater
 - Surface soil
 - Subsurface soil
- Aquifer testing (slug testing)
- Decontamination
- Geographic Land Surveying using Global Positioning Systems (GPS)
- IDW Management

For more detailed description of the associated tasks, refer to the Work Plan (WP).

5.0 TASKS/HAZARDS/ASSOCIATED CONTROL MEASURES

Table 5-1 of this section is intended to assist project personnel in the recognition of hazards and recommended control measures necessary for each planned task to minimize potential exposure or injuries related to those hazards. The table also assists field team members in determining which personal protective equipment (PPE) and decontamination procedures are to be used as well as appropriate air monitoring techniques and action levels. This table must be updated if the scope of work, contaminants of concern, or pertinent conditions change.

Safe Work Permits will be issued for all site activities (See Section 10.2). The FOL and/or the SSO will use the elements defined in Table 5-1 as the primary reference for completing the Safe Work Permit adding additional information as warranted.

5.1 GENERAL SAFE WORK PRACTICES

These safe work practices establish a pattern of general precautions and measures for reducing risks associated with hazardous site operations.

- Refrain from 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.
- Wash hands and face thoroughly upon leaving a contaminated or suspected contaminated area. This is especially critical between breaks and prior to lunch and associated hand to mouth activities.
- Avoid contact with potentially contaminated substances by walking around puddles, pools, mud, or other such areas. Avoid, whenever possible, kneeling on the ground or leaning or sitting on equipment. Do not place monitoring equipment on potentially contaminated surfaces.
- Be familiar with and adhere to instructions provided within this site-specific HASP.
- Be aware of the location of the nearest telephone and emergency telephone numbers. See Section 2.0, Table 2-1.
- Attend briefings on anticipated hazards, equipment requirements, Safe Work Permits, emergency procedures, and communication methods before going on site.

- Plan and mark entrance, exit, and emergency escape routes. See Section 2.0.
- Rehearse unfamiliar operations prior to implementation.
- Use the “buddy system”.
- Maintain visual contact with each other and with other on-site team members by remaining in close proximity in order to assist each other in case of emergency.
- 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 Site Health and Safety Officer (SSO).
- Observe coworkers 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.

5.2 DRILLING (HSA/DPT) SAFE WORK PRACTICES

The following Safe Work Practices are to be followed when working in or around the HSA Drill Rig Operations.

5.2.1 Before Drilling

- Identify underground utilities, buried structures, and above ground utility lines, before drilling. This service is provided by the NAS Pensacola and Sunshine State One Call of Florida. In addition, Tetra Tech NUS, Inc. personnel will use the Utility Locating and Excavation Clearance Standard Operating Procedure provided in Attachment II.

- Drill rigs will be inspected by the SSO or designee, prior to the acceptance of the equipment at the site and prior to the use of the equipment needed. Repairs or identified deficiencies will be corrected prior to use. The inspection will be accomplished using the Equipment Inspection Checklist provided in Attachment III. Additional inspections will be performed at least once every 10-day shift or following repairs.
- Check operation of the Emergency Stop Switch (initially, then periodically thereafter).
- Ensure that machine guarding is in place and properly adjusted.
- Block drill rig and use out rigger levelers to prevent movement of the drill.
- The work area around the point of operation will be graded to the extent possible to remove any trip hazards near or surrounding operating equipment.
- The driller's helper will establish an equipment staging and lay down plan. The purpose of this is to keep the work area clear of clutter and slips, trips, and fall hazards. Mechanisms to secure heavy objects such as drill flights will be provided to avoid the collapse of stacked equipment.
- Potentially contaminated tooling will be wrapped in polyethylene sheeting for storage and transport to the centrally located equipment decontamination unit.
- Prior to each instance of engaging the HSA drill rig, the Driller will look to ensure that the drilling area is clear of personnel and obstructions, and verbally alert all persons that the rig is about to be engaged.
- Prior to the start of boring operations, one individual will be designated as the person responsible for immediate activation of the emergency stop device (if applicable) in the event of an emergency. This individual will be made known to the field crew and will be responsible for visually checking the work area and verbally alerting personnel in the vicinity of boring operations prior to engaging the equipment.

5.2.2 During Drilling

- The Driller will ensure that an individual is constantly stationed at a location where the drill rig emergency stop switch can be immediately engaged.

- Minimize contact to the extent possible with contaminated tooling and environmental media.
- Support functions (sampling and screening stations) will be maintained a minimum distance from the drill rig of the height of the mast plus five feet or 35-feet for HSA, 25-feet for DPT operations whichever is greater to remove these activities from within physical hazard boundaries.
- Only qualified operators and knowledgeable ground crew personnel will participate in the operation of the drill rig.
- During maintenance, use only manufacturer provided/approved equipment (i.e. auger flight connectors, etc.)
- In order to minimize contact with potentially contaminated tooling and media and to minimize lifting hazards, multiple personnel should move auger flights and other heavy tooling.
- Only personnel absolutely essential to the work activity will be allowed in the exclusion zone.

5.2.3 After Drilling

- Equipment used within the exclusion zone will undergo a complete decontamination and evaluation by the SSO to determine cleanliness prior to moving to the next location, exiting the site, or prior to down time for maintenance.
- Motorized equipment will be fueled prior to the commencement of the days activities. During fueling operations equipment will be shutdown and bonded to the fuel source.
- When not in use drill rigs will be shutdown, and emergency brakes set and wheels will be chocked to prevent movement.
- Areas subjected to subsurface investigative methods by drilling/DPT will be restored to equal or better condition than original. Contamination brought to the surface will be removed. In situations where these hazards cannot be removed these areas will be barricaded to minimize the impact on field crews working in the area.

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES
NAS PENSACOLA,
PENSACOLA, FLORIDA**

Task/Operation/Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring	Personal Protective Equipment <i>(Items in italics are deemed optional as conditions or the FOL or SSO require)</i>	Decontamination Procedures
<p>Mobilization/ Demobilization</p> <p>This activity includes, but not limited to:</p> <ul style="list-style-type: none"> - Equipment Preparation and Inspection - Resource acquisition and unpacking of supplies - Site clearance and preparation – Utility clearances, etc. - Construct decontamination and IDW operation and storage facilities, as applicable. 	<p>Chemical hazards:</p> <p>1) Exposure to identified site contaminants are not anticipated. However, potential exposure to chemicals brought on-site should be considered.</p> <p>Physical hazards:</p> <p>2) Lifting (strain/muscle pulls)</p> <p>3) Pinches and compressions</p> <p>4) Slips, trips, and falls</p> <p>5) Vehicular and foot traffic</p> <p>Natural hazards:</p> <p>6) Ambient temperature extremes (heat/cold stress)</p> <p>7) Insect and animal bites</p> <p>8) Inclement weather</p>	<p>1) The on-site Hazard Communication Program (Section 5.0 TtNUS Health and Safety Guidance Manual) will be followed. All chemicals brought onto the site by Tetra Tech NUS and subcontractor personnel will be inventoried with each applicable chemical having an MSDS on site, on file. This effort shall include:</p> <ul style="list-style-type: none"> - A Chemical Inventory list is generated for chemicals brought on site (Complete Section 5.0 of the Tetra Tech NUS Health & Safety Guidance Manual) - MSDS's must be available for chemicals brought on site. - Materials are stored in accordance with recommended practices and according to compatibility (See MSDS for storage and compatibility recommendations). The FOL and/or the SSO will preview work locations in an effort to identify, barricade and/or remove physical and biological hazards prior to the commitment of any personnel, equipment or other resources. <p>2) Use machinery or multiple personnel for heavy lifts, where possible.</p> <ul style="list-style-type: none"> - Use proper lifting techniques - Lift with your legs, not your back, bend your knees move as close to the load as possible, and ensure good hand holds are obtainable. - Minimize the horizontal distance to the center of the lift to your center of gravity. - Minimize turning and twisting when lifting as the lower back is especially vulnerable at this time. - Break lifts into steps if the vertical distance (from the start point to the placement of the lift) is excessive. - Plan your lifts – Place heavy items on shelves between the waist and chest; lighter items on higher shelves. - Periods of high frequency lifts or extended duration lifts should provide sufficient breaks to guard against fatigue and injury. - Area available to maneuver the lift. - Area of the lift – Work place clutter, slippery surfaces <p>3) Only modify tools according to manufacturer's instruction.</p> <ul style="list-style-type: none"> - Keep any machine guarding in place, avoid moving parts. - Use tools or equipment where necessary to avoid placing hands in areas vulnerable to pinch points. - Adjust machine guarding as necessary to minimize access into the machine. - When staging equipment, insure all stacked loads, shelving, are adequately secure to avoid creating a hazard from falling objects. <p>4) Preview work locations for unstable/uneven terrain.</p> <ul style="list-style-type: none"> - Cover, guard and barricade all open pits, ditches, and floor opening as necessary. - Ruts, roots, tools, and other tripping hazards should be eliminated to minimize trips and falls. - Maintain a clutter free work area. - As part of site control efforts construct fences or other means of demarcation (i.e. signs and postings) to control and isolate traffic in the work area. Means of demarcation shall also be constructed isolating resource and/or staging areas. <p>5) Establish safe zones of approach (i.e. Boom or mast + 5 feet). See Table 5-1 for Soil boring/Monitoring Well Installation for recommended distances.</p> <ul style="list-style-type: none"> - The mast will be lowered when moving the rig. - Foot and vehicular traffic routes shall be well defined. - Heavy equipment patterns shall be isolated using fences or other suitable barricades from pedestrian pathways. - Bumpers or other suitable traffic stops shall be placed in areas where it is desired that traffic approaching an drop offs or unprotected banks. - All self-propelled equipment with restricted vision moving backwards shall be equipped with back up warning systems. - The FOL and/or the SSO as a precautionary measure to remove or demarcate physical hazards shall preview traffic routes (foot and vehicular) before the commitment of personnel and resources. <p>6) Wear appropriate clothing for weather conditions. Provide acceptable shelter and liquids for field crews. Additional information regarding heat and cold stress is provided in Section 4.0 of the TtNUS Health and Safety Guidance Manual.</p> <p>7) This is not considered a predominant hazard as these activities are to be conducted in a well maintained area. To combat the potential impact of natural hazards, the following actions are recommended:</p> <ul style="list-style-type: none"> - Wear light color clothes and, if necessary, tape pant legs to work boots to block direct access. - Use repellents – Permethrin should be applied liberally to the clothing, but not the skin as it may cause irritation. Follow manufacturer's recommendations for use. <p>8) Suspend or terminate operations until directed otherwise by SSO. See Section 4.0 of the TtNUS Health and Safety Guidance Manual for additional information concerning natural hazards.</p>	<p>Visual observation of work practices by the FOL and/or the SSO to minimize potential physical hazards (i.e., improper lifting, unsecured loads, cutting practices, etc.).</p> <p>Monitoring for chemical hazards are not required during this activity.</p>	<p>Level D - (Minimum Requirements)</p> <ul style="list-style-type: none"> - Standard field attire (Sleeved shirt; long pants) - Safety shoes (Steel toe/shank) - <i>Safety glasses</i> - <i>Hardhat (when overhead hazards exists, or identified as a operation requirement)</i> - <i>Reflective vest for high traffic areas</i> - <i>Hearing protection for high noise areas (At the direction of the FOL and/or the SSO).</i> <p>As site conditions may change, the following equipment will be maintained during all on-site activities as prescribed in Section 2.0 of this HASP</p> <ul style="list-style-type: none"> - Fire Extinguishers - First-aid kit <p>Note: The FOL and/or the SSO will determine the number of fire extinguishers and first-aid kits to be made available based on the number of operations to be conducted at any given time.</p>	<p>Not required.</p> <p>Good personal hygiene practices should be employed prior to breaks lunch or other period when hand to mouth contact occurs. This will minimize potential ingestion exposures.</p> <p>Personnel should inspect themselves and one another for the presence of ticks when exiting wooded areas, grassy fields, etc. This action will be employed to assist in stopping the transfer of these insects into vehicles, homes, and offices.</p> <p>In a review of a number of tick bites reported over the past few years, the ticks that went undetected were located on the back and in the shoulder areas. Have your buddy examine this area carefully.</p>

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES
NAS PENSACOLA, PENSACOLA, FLORIDA**

Task/Operation/Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring	Personal Protective Equipment <i>(Items in italics are deemed optional as conditions or the FOL or SSO require)</i>	Decontamination Procedures
<p>Monitoring Well Installation - using Hollow Stem Augers</p> <p>Soil Borings – using DPT</p>	<p>Chemical hazards:</p> <p>1) Previous analytical data identified the following as the primary contaminants of concern: Volatile Organic Compounds (VOCs), including low concentrations of chlorinated solvents such as tetrachloroethylene (PCE) and trichloroethylene (TCE).</p> <p>Further information on these contaminants are presented in Section 6.1, and Table 6-1.</p> <p>2) Transfer of contamination into clean areas or onto persons</p> <p>Physical hazards:</p> <p>3) Heavy equipment hazards (pinch/compressions points, rotating equipment, hydraulic lines, etc.)</p> <p>4) Noise in excess of 85 dBA</p> <p>5) Energized systems (contact with underground or overhead utilities)</p> <p>6) Lifting (strain/muscle pulls)</p> <p>7) Slips, trips, and falls</p> <p>8) Cuts and lacerations</p> <p>9) Vehicular and foot traffic</p> <p>Natural hazards:</p> <p>10) Inclement weather</p> <p>11) Insect bites</p>	<p>1) Avoid contact with contaminated media (air, water, soils, etc.) through proper use and application of PPE. As the contaminants are solids and/or bound to particulates, use dust suppression to minimize potential exposure. In addition, good work and personal hygiene measures will be used to control exposure through ingestion. Avoid hand to mouth contact wash hands and face or use hygienic wipes to remove potential contaminants prior to breaks or lunch or other hand to mouth activities.</p> <p>2) Restrict the cross use of equipment and supplies between locations and activities without first going through a suitable decontamination. Work practices including establishing a rigid decontamination procedure will be employed for all equipment between locations and between clean and potentially dirty work. This provision along with dedicated sampling equipment will insure materials are not carried and deposited in unaffected areas.</p> <p>3) All equipment will be:</p> <ul style="list-style-type: none"> - Inspected in accordance with Federal safety and transportation guidelines, OSHA (1926.600.601.602), and manufacturer's design, as applicable. All inspections will be documented using the Equipment Inspection - Checklist (for Drill Rigs) found in (See Attachment III) of this HASP. - Operated and supported by knowledgeable operators and ground crew. - Personnel not directly supporting this operation will remain at least 35-feet for HSA Rigs and 25 feet for DPT rigs from the point of operation or the height of the mast plus 5-feet, whichever is greater. - All personnel will be instructed in the location and operations of the emergency shut-off device(s). This device will be tested initially (and then daily) to ensure its operational status. - One person will be designated as the Emergency Shut Off Device Operator. <p>Prior to engaging the augers, the driller will announce, loud enough for all to hear that he is engaging the augers. He will visually confirm that all personnel are removed from the rotating equipment then engage the augers.</p> <ul style="list-style-type: none"> - Areas will be inspected prior to the movement of the direct push rig and support vehicles to eliminate any physical hazards. This will be the responsibility of the FOL and/or SSO. - See additional safe work procedures for drilling in Section 5.9 of this HASP as well as in Section 4.0 of the Health & Safety Guidance Manual. <p>4) Excessive noise levels will be mitigated through the use of hearing protection. Any piece of equipment or operation that has the potential to generate excessive noise levels (i.e., you must raise your voice to speak to someone within two feet of where you are standing) will require hearing protection until sound level measurements and/or noise dosimetry may be conducted to quantify the associated noise levels.</p> <p>5) All drilling activities will proceed in accordance with the Utility Locating and Excavation Clearance SOP in Attachment II of this HASP. All utility clearances will be obtained in writing, and locations identified and marked, prior to activities.</p> <p>6) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques as described in Table 5-1 for mobilization/demobilization. Drill stems, auger flights, and well construction supplies are some of the common material that are handled and because of their weight will present a lifting strain hazard associated with this activity.</p> <p>7) Preview work locations and site lines for uneven/unstable terrain. Clear necessary vegetation and establish temporary means for traversing hazardous terrain (e.g. rope ladders).</p> <p>8) Use the knife and acetate tube retention tub recommended by Geoprobe (Geoprobe Sampling Kit) to prevent potential cuts and lacerations when accessing samples within MacroCore acetate liners.</p> <ul style="list-style-type: none"> - Always cut away from yourself and others. - Do not place items to be cut in your hand or on your knee. - Maintain a sharp cutting edge. - Wear cut-resistant gloves (leather or heavy cotton) - Use traffic-warning signs, flag persons, and high visibility vests as determined by the SSO when work infringes traffic thoroughfares. Use physical barricades, when working within or altering normal traffic flow patterns/traffic lanes. <p>10) Wear appropriate clothing for weather conditions. Follow the provisions as specified in Section 4.0 of the Tetra Tech NUS, Inc. Health and Safety Guidance Manual regarding the identification and evaluation of heat/cold stress related conditions.</p> <p>11) Wear appropriate clothing and PPE. Avoid potential nesting areas and suspicious vegetation. When feasible and necessary, use commercially available insect repellants. Report potential hazards to the SSO. Inspect clothing and persons for ticks and other vectors during and after work activities in wooded areas.</p>	<p>Direct reading instrument such as Flame Ionization Detector will be used to detect volatile organic compounds (VOCs). Although HSA techniques do not typically generate significant airborne dusts, observation of visible dusts in the worker breathing zone will serve as an action level for implementing dust suppression methods.</p> <p>Site contaminants of concern are not anticipated to be present in concentrations that would pose an inhalation hazard to site personnel. Additionally, site activities are not likely to generate airborne dusts that would pose an inhalation exposure hazard. The FID will be used to screen potential source (sample locations, boreholes, etc.) areas to detect the presence of any VOCs. Positive readings at a source area will require that worker's breathing zone be monitored to determine exposure potentials.</p> <p>Any sustained readings above 25 ppm (> 1 minute in duration) in a worker's breathing zone, or observations of symptoms of exposure, will require that site activities be suspended until the readings subside to background levels or the source is determined.</p> <p>As necessary, dust will be controlled by wetting with a water spray. If airborne dusts cannot be controlled, site activities will be suspended until dust monitoring is available and upgraded levels of protection provided, if necessary.</p>	<p>Subsurface operations are to be initiated in Level D protection. Level D protection constitutes the following minimum protection:</p> <ul style="list-style-type: none"> - Standard field dress (Long pants and sleeved shirts) - Tyvek coveralls and disposable boot covers if surface contamination is present or if the potential exists of soiling work attire. - Surgical style nitrile gloves - Steel toe shoes or work boots - Disposable nitrile gloves - Safety glasses - Hardhat (when approaching the drill rig) - <i>Reflective vest for high traffic areas</i> - <i>Hearing protection for high noise areas, as directed by the SSO.</i> <p>Note: The Safe Work Permit for this task (see Attachment IV) will be issued at the beginning of the task to address planned activities. Additional PPE may be assigned to reflect site-specific conditions or special considerations.</p>	<p>Personnel Decontamination -This function will take place at an area adjacent to the work operations.</p> <p>This decontamination procedure for Level D protection will consist of</p> <ul style="list-style-type: none"> - Equipment drop - Soap/water wash and rinse of outer coveralls, gloves and boots, if applicable -Outer coverall and outer glove removal - Disposal of non-reusable PPE in doubly-lined bags/ and then into an industrial dumpster - Wash hands and face, leave contamination reduction zone <p>Equipment Decontamination – See Decontamination of heavy equipment. Heavy 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 or tracks cleaned along with any loose debris removed, prior to transporting to the central decontamination area. All site vehicles will have restricted access to exclusion zones, and 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 on-site activity.</p> <p>All equipment used in the exclusion zone will require a complete decontamination between locations and prior to removal from the site.</p> <p>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.</p> <p>Soil cuttings shall be containerized in 55-gallon drums, labeled, and staged pending disposal characterization.</p>

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES
NAS PENSACOLA, PENSACOLA, FLORIDA**

Task/Operation/Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring	Personal Protective Equipment <i>(Items in italics are deemed optional as conditions or the FOL or SSO require)</i>	Decontamination Procedures
<p>Multi-media sampling, including</p> <ul style="list-style-type: none"> - Monitoring Well Development - Aquifer testing (slug testing) - Groundwater Sampling - Surface and Subsurface soil 	<p>Chemical hazards:</p> <p>1) Previous analytical data identified the following as the primary contaminants of concern: Volatile Organic Compounds (VOCs), including low concentrations of chlorinated solvents such as tetrachloroethylene (PCE) and trichloroethylene (TCE).</p> <p>These compounds were not in sufficient concentrations to present and exposure threat through inhalation.</p> <p>Further information on these contaminants are presented in Section 6.1, and Table 6-1.</p> <p>2) Transfer of contamination into clean areas.</p> <p>Physical hazards:</p> <p>3) Slip, trip, and fall hazards</p> <p>4) Strain/muscle pulls from manual lifting</p> <p>5) Ambient temperature extremes (heat/cold stress)</p> <p>Natural hazards:</p> <p>6) Animal and insect bites and encounters</p> <p>7) Inclement weather</p>	<p>1) Avoid contact with contaminated media (air, water, soils, etc.) through proper use and application of PPE. As the materials in question are solids and/or bound to particulates, dust/particulate suppression will be the next control measure employed to minimize potential exposure. In addition, good work and personal hygiene measures will be employed to control exposure through ingestion. Avoid hand to mouth contact to the extent possible wash hands and face or use hygienic wipes to remove potential contaminants from hands and face prior to breaks or lunch or other hand to mouth activities. It should be noted that exposure during DPT/HSA in an open air environment is not anticipated. During the execution of these two activities limited surface area is being disturbed thereby minimizing the potential to mechanically agitate a sufficient amount of material to become airborne. This minimizes potential exposure. In addition, as these activities are conducted outside where general wind patterns may knock down and disperse airborne dust.</p> <p>When sampling groundwater wells exposure potential is the greatest when opening a well that has been sealed and that gases have built up inside. The following practice should be employed</p> <ul style="list-style-type: none"> - At arms length, open the well and step away. Let the well off gas for a few minutes, while you prepare your equipment. <p>Airborne concentrations will recede and you can continue with your task.</p> <p>2) Transfer of Contamination into Clean Areas - Decontaminate all equipment and supplies between sampling locations and prior to leaving the site. See decontamination of heavy and sampling equipment for direction regarding this task. In addition, the bulk of sampling equipment such as tubing, trowels are disposable therefore dedicated. This will aid in preventing cross contamination.</p> <p>3) Preview work locations and site lines for uneven/unstable terrain. Clear necessary vegetation and establish temporary means for traversing hazardous terrain (e.g. rope ladders).</p> <p>4) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques (See Lifting Mobilization/Demobilization of this table).</p> <p>5) Wear appropriate clothing for weather conditions. Provide acceptable shelter and liquids for field crews. Additional information regarding heat/cold stress is provided in Section 4.0 of the Health and Safety Guidance Manual. Care should be exercised when working outdoors due to harmful effects of the sun.</p> <p>6) Wear light color clothes.</p> <ul style="list-style-type: none"> - When opening existing well heads be cautious of bees and spiders as these are preferred nesting locations. - Use repellents – Permethrin should be applied liberally to the clothing, but not the skin as it may cause irritation. Concentrate on areas where ticks and other insects may access your body such as pant cuffs, shirt to pants, and collars. Products containing DEET can be applied directly to the skin. As always, follow manufacturer's recommendations for use. See Section 4.0 of the Health and Safety Guidance Manual Section 4.0 for more information concerning these natural hazards. <p>7) Suspend or terminate operations during electrical storms. Return to work when directed by the FOL and/or the SSO.</p>	<p>Direct reading instrument such as Flame Ionization Detector will be used to detect volatile organic compounds (VOCs). Although HSA techniques do not typically generate significant airborne dusts, observation of visible dusts in the worker breathing zone will serve as an action level for implementing dust suppression methods.</p> <p>Site contaminants of concern are not anticipated to be present in concentrations that would pose an inhalation hazard to site personnel. Additionally, site activities are not likely to generate airborne dusts that would pose an inhalation exposure hazard. The FID will be used to screen potential source (sample locations, boreholes, etc.) areas to detect the presence of any VOCs. Positive readings at a source area will require that worker's breathing zone be monitored to determine exposure potentials.</p> <p>Any sustained readings above 25 ppm (> 1 minute in duration) in a worker's breathing zone, or observations of symptoms of exposure, will require that site activities be suspended until the readings subside to background levels or the source is determined.</p> <p>As necessary, dust will be controlled by wetting with a water spray. If airborne dusts cannot be controlled, site activities will be suspended until dust monitoring is available and upgraded levels of protection provided, if necessary.</p>	<p>Level D protection constitutes the following for sampling activities</p> <p>Standard field dress (long pants, Sleeved shirts) Steel toe safety shoes or work boots Safety glasses Nitrile surgeon style inner gloves for sampling <i>Hard Hats</i> <i>Hearing protection</i> <i>Impermeable boot covers</i> <i>Reflective vest for traffic areas</i></p> <p>Protective Measures as specified for drilling and soil boring will be employed for all subsurface soil sampling at the drill rig.</p> <p>Note: The Safe Work Permit(s) for this task (See Attachment IV) will be issued at the beginning of each day to address the tasks planned for that day. As part of this task, additional PPE may be assigned to reflect site-specific conditions or special considerations or conditions associated with any identified task.</p>	<p>Personnel Decontamination</p> <p>Upon completion of the sampling</p> <ul style="list-style-type: none"> - Dedicated trowels, tubing, PPE will be rinsed and bagged for disposal. - Handi-Wipes or similar product will be used to clean hands, prior to moving to the next location. <p>Equipment Decontamination</p> <p>Decontamination of equipment (sampling and hand tools) will proceed as indicated in Table 5-1 of this HASP and/or the Workplan.</p>

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES
NAS PENSACOLA, PENSACOLA, FLORIDA**

Tasks/Operation/Locations	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring	Personal Protective Equipment <i>(Items in italics are deemed optional as conditions or the FOL or SSO require)</i>	Decontamination Procedures
<p>Decontamination of Heavy Equipment using pressure washers or steam cleaners.</p> <p>Decontamination of sampling equipment using 5-gallon buckets/scrub brushes, etc..</p> <p>It is anticipated that this activity will take place at a temporary centralized location. Gross contamination will be removed to the extent possible at the site. Contaminated tooling then will be wrapped in polyethylene sheeting for transport to the centralized location for a full decontamination and evaluation.</p>	<p>Chemical hazards:</p> <p>1) Previous analytical data identified the following as the primary contaminants of concern: Volatile Organic Compounds (VOCs), including low concentrations of chlorinated solvents such as tetrachloroethylene (PCE) and trichloroethylene (TCE).</p> <p>These compounds were not in sufficient concentrations to present and exposure threat through inhalation.</p> <p>Further information on these contaminants are presented in Section 6.1, and Table 6-1.</p> <p>2) Decontamination fluids - Liquinox (detergent); isopropanol (decontamination solvent)</p> <p>Physical hazards:</p> <p>3) Lifting (strain/muscle pulls) 4) Noise in excess of 85 dBA 5) Flying projectiles 6) Falling hazards 7) Slips, trips, and falls</p> <p>Natural hazards:</p> <p>8) Inclement weather</p>	<p>1) and 2) Employ protective equipment to minimize contact with site contaminants and hazardous decontamination fluids. Control potential non-occupational exposures through good work hygiene practices (i.e., avoid hand to mouth contact; wash hands and face before breaks and lunch; minimize contact with contaminated media). Obtain and familiarize yourself with manufacturer's MSDS for any decontamination fluids used on-site. Solvents may only be used in well-ventilated areas, such as outdoors. Use appropriate PPE as identified on MSDS or within this HASP. All chemicals used must be listed on the Chemical Inventory for the site, and site activities must be consistent with the Hazard Communication Program provided in Section 5.0 of the TtNUS Health and Safety Guidance Manual.</p> <p>3) Use multiple persons where necessary for lifting and handling heavy equipment for decontamination purposes. - Employ proper lifting techniques as described in Table 5-1, Mobilization/Demobilization.</p> <p>4) Wear hearing protection when operating the pressure washer and/or steam cleaner. Sound pressure levels measured during the operation of similar pieces of equipment indicate a range of 87 to 93 dBA.</p> <p>5) Use eye and face protective equipment when operating the pressure washer and/or steam cleaner, due to flying projectiles. All other personnel must be restricted from the area. In addition to minimize hazards (flying projectiles, water lacerations and burns) associated with this operation, the following controls will be implemented - A Fan Tip 25° or greater will be used on pressurized systems over 3,000 psi. This will reduce the possibility of water lacerations or punctures. - Do not point the wand at persons or place against any part of your body. - Thermostat control will be in place and operational to control the temperature levels of the water where applicable. - Visual evaluations of hoses and fittings for structural defects - Construct deflection screens as necessary to control overspray and to guard against dispersion of contaminants driven off by the spray.</p> <p>6) Ensure wash and drying racks are of suitable construction to prevent heavier items such as auger flights and drill rods from falling and striking someone during the decontamination process.</p> <p>7) The decontamination pad should be constructed to contain wash waters generated during decontamination procedures. Temporary decontamination pads are usually 10-30 mil polyethylene or polyvinyl chloride tarp construction. Although these items when used as a liner offer containment, they also present a slipping hazard. When these temporary liners are employed, it is recommended that a light coating of sand be spread over the walking surface to provide traction. - In addition, adequate slope should be provided to the pad to permit drainage away from the object being cleaned. The collection point for wash waters should be of adequate distance that the decontamination workers do not have to walk through the wash waters while completing their tasks. - Hoses should be gathered when not in use to eliminate potential tripping hazards.</p> <p>8) Suspend or terminate operations until directed otherwise by SSO.</p>	<p>Use visual observation and real-time monitoring instrumentation to ensure all equipment has been properly cleaned of contamination and dried.</p>	<p>For Heavy Equipment</p> <p>This applies to pressure washing and/or steam cleaning operations and soap/water wash and rinse procedures.</p> <p>Level D Minimum requirements: - Hard hat with splash shield - Standard field attire (Long sleeve shirt; long pants) - Safety shoes (Steel toe/shank) - Chemical resistant boot covers - Nitrile outer gloves over nitrile inner gloves - Safety glasses underneath a splash shield - Hearing protection (plugs or muffs) - <i>Hooded PVC Rainsuits or PE or PVC coated Tyvek.</i> Impermeable aprons may be used instead of coveralls if they offer adequate protection against overspray and back splash.</p> <p>For sampling equipment (trowels, split spoons,, etc.), the following PPE is required</p> <p>Note: Consult MSDS for additional PPE guidance. Otherwise, observe the following.</p> <p>Level D Minimum requirements - - Standard field attire (Long sleeve shirt; long pants) - Safety shoes (Steel toe/shank) - Nitrile outer gloves over nitrile inner gloves - Safety glasses - <i>Impermeable apron</i></p> <p>Note: The Safe Work Permit(s) for this task (See Attachment IV) will be issued at the beginning of each day to address the tasks planned for that day. As part of this task, additional PPE may be assigned to reflect site-specific conditions or special considerations or conditions associated with any identified task.</p>	<p>Personnel Decontamination will consist of a soap/water wash and rinse for reusable and non-reusable outer protective equipment (boots, gloves, PVC splash suits, as applicable).</p> <p>The sequential procedure is as follows: Stage 1: Equipment drop, remove outer protective wrapping; personnel will wash hand tools and pass hand equipment through as necessary. Stage 2: Soap/water wash and rinse of outer boots and gloves Stage 3: Soap/water wash and rinse of the outer splash suit or apron as applicable Stage 4: Disposable PPE will be removed and bagged. Stage 5: Wash face and hands</p> <p>Equipment Decontamination - All heavy equipment decontamination will take place at a centralized decontamination pad utilizing a steam cleaner or pressure washer.</p> <ul style="list-style-type: none"> - Remove gross (visible) materials using scrapers, shovels as necessary (soils, etc.) - Use the pressure washer/steam cleaner remove remaining visible debris. - As necessary, follow up with scrub brushes with Alconox or Liquinox detergent wash. - Potable water rinse using pressure washer/steam cleaner as necessary - DI water rinse - Air dry <p>Heavy equipment will have the wheels and tires cleaned along with any loose debris removed, prior to transporting to the central decontamination area.</p> <p>Sampling Equipment Decontamination</p> <ul style="list-style-type: none"> - Remove heavy materials (soils, etc.) - Alconox or Liquinox detergent wash - Potable water rinse - Solvent rinse (Isopropanol) - DI water rinse - Air dry <p>All equipment used in the exclusion zone will require a complete decontamination between locations and prior to removal from the site.</p> <p>The FOL or the SSO will be responsible for evaluating equipment arriving on-site, leaving the site, and between locations. No equipment will be authorized access, exit, or movement to another location without this evaluation.</p>

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES
NAS PENSACOLA, PENSACOLA, FLORIDA**

Tasks/Operation/Locations	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring	Personal Protective Equipment <i>(Items In Italics Are Deemed Optional As Conditions Or The FOL Or the SSO require)</i>	Decontamination Procedures
<p>IDW Management/ moving IDW drums to a storage area</p>	<p>Chemical hazards:</p> <p>1) Previous analytical data identified the following as the primary contaminants of concern: Volatile Organic Compounds (VOCs), including low concentrations of chlorinated solvents such as tetrachloroethylene (PCE) and trichloroethylene (TCE).</p> <p>These compounds were not in sufficient concentrations to present and exposure threat through inhalation.</p> <p>Further information on these contaminants is presented in Section 6.1 and Table 6-1.</p> <p>2) Transfer of contamination into clean areas or onto persons</p> <p>Physical hazards:</p> <p>3) Lifting (strain/muscle pulls)</p> <p>4) Heavy equipment hazards (pinch/compression points).</p> <p>5) Noise in excess of 85 dBA</p> <p>6) Slip, trip, and fall hazards (uneven or unstable terrain)</p> <p>7) Vehicular and foot traffic</p> <p>8) Ambient temperature extremes</p> <p>Natural hazards:</p> <p>9) Inclement weather</p>	<p>1) All staged IDW containers should be clearly labelled. Contact with the container's contents should be avoided whenever possible. Identify PPE to control exposures to potentially contaminated media, prior to drum movement.</p> <p>2) Decontaminate all equipment and supplies, if they have become contaminated.</p> <p>3) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques. See Table 5-1 for details.</p> <p>4) Keep hands and fingers free of drum pinch/compression points. Use tools or equipment to avoid contacting pinch points. Whenever possible, use drum dollies to transport drums. Drums shall be staged as follows: - sealed with rings, bolts, and gaskets - four drums to a pallet; labels must face outward - stationed with a minimum of 4 feet between rows - inventory must be available</p> <p>5) Excessive noise levels will be mitigated through the use of hearing protection. Any piece of equipment or operation that has the potential to generate excessive noise levels (i.e., you must raise your voice to speak to someone within 2 feet of where you are standing) will require hearing protection until sound level measurements and/or noise dosimetry may be conducted to quantify the associated noise levels.</p> <p>6) Preview work locations for uneven/unstable terrain.</p> <p>7) Establishing safe zones of approach. - Checking that equipment is equipped with movement warning systems. - Ensuring all personnel working in high equipment traffic areas are wearing reflective vests for high visibility. - Following traffic rules and requirements established by NAS Pensacola. - Traffic patterns will be determined in support of on-site activities.</p> <p>8) Wear appropriate clothing for the anticipated weather conditions while maintaining the required level of protection. Provide acceptable shelter and fluids for field crews. Refer to the TtNUS Health and Safety Guidance Manual for additional information regarding heat and cold stress.</p> <p>9) In the event of inclement weather suspend or terminate operations until directed by the SSO.</p>	<p>None Required, unless spill containment provisions are invoked. Then monitoring will proceed as described in the activity associated with the task when the materials were generated such as Soil boring or well installation.</p>	<p>Level D - (Minimum Requirements)</p> <ul style="list-style-type: none"> - Standard field attire (Sleeved shirt; long pants) - Safety shoes (Steel toe/shank) - Leather or canvas work gloves - <i>Safety glasses (When utilizing cables or slings to move the containers)</i> - <i>Hardhat (when overhead hazards exists, or identified as a operation requirement)</i> <p>PPE changes may be made with the implementation of the Spill Containment Program. This represents the only anticipated modification to this level of protection.</p>	<p>Personnel Decontamination -This function will take place at an area adjacent to the site activities.</p> <p>This decontamination procedure for Level D protection will consist of</p> <ul style="list-style-type: none"> - 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 - Bag disposable PPE - Wash hands and face, leave contamination reduction zone

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES
NAS PENSACOLA, PENSACOLA, FLORIDA**

Tasks/Operation/Locations	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring	Personal Protective Equipment <i>(Items In Italics Are Deemed Optional As Conditions Or The FOL Or the SSO require.)</i>	Decontamination Procedures
Geographical Land Surveying	<p>Chemical hazards:</p> <p>1) Exposure to potential site contaminants during surveying activities is unlikely given the nature of surveying work and the limited contact with potentially contaminated media (i.e. soils, etc.)</p> <p>Refer to Section 6.0 for a list of potential and representative site contaminants. See individual Safe Work Permits contained in Attachment III for specific contaminants of concern associated with particular sites and site activities.</p> <p>Physical hazards:</p> <p>2) Slip, trip, and fall hazards (uneven or unstable terrain)</p> <p>3) Vehicular and foot traffic</p> <p>4) Ambient temperature extremes</p> <p>Natural hazards:</p> <p>5) Insect/animal bites or stings, poisonous plants, etc.)</p> <p>6) Inclement weather</p>	<p>1) To further reduce the potential for exposure, personnel performing surveying activities will minimize contact with potentially contaminated media and will avoid areas where chemical hazards may exist.</p> <p>2) Preview work locations and site lines for uneven/unstable terrain. Clear necessary vegetation and establish temporary means for traversing hazardous terrain (e.g. rope ladders).</p> <p>3) Establishing safe zones of approach. <ul style="list-style-type: none"> - Ensuring all personnel working in high equipment traffic areas are wearing reflective vests for high visibility. - Following traffic rules and requirements established by NAS Pensacola. - Traffic patterns will be determined in support of on-site activities. </p> <p>4) Wear appropriate clothing for the anticipated weather conditions while maintaining the required level of protection. Provide acceptable shelter and fluids for field crews. Refer to the TtNUS Health and Safety Guidance Manual for additional information regarding heat and cold stress.</p> <p>5) Wear appropriate clothing and PPE. Avoid potential nesting areas and suspicious vegetation (poison oak & ivy, etc.). When feasible and necessary, use commercially available insect repellants. Report potential hazards to the SSO. Inspect clothing and persons for ticks and other vectors during and after work activities in wooded areas.</p> <p>6) All operations will be temporarily suspended during electrical storms.</p>	<p>Air monitoring is not required given the unlikelihood that airborne contaminants will be present. The potential for exposure to site contaminants during this activity is considered minimal.</p>	<p>Surveying activities shall be performed in Level D protection</p> <p>Level D Protection consists of the following:</p> <ul style="list-style-type: none"> - Standard field dress including sleeved shirt and long pants - Shoes rugged lug sole for traction - Work gloves shall be worn when clearing brush. - <i>Safety glasses, hard hats (if working near machinery, overhead hazards, or clearing brush)</i> - <i>Snake chaps for heavily wooded area where encounters are likely.</i> - <i>Tyvek coveralls may be worn to provide additional protection against poisonous plants and insects, particularly ticks.</i> - <i>Reflective or blaze orange vests should be worn when working along traffic thoroughfares.</i> <p>Note: The Safe Work Permit(s) for this task (See Attachment IV) will be issued at the beginning of each day to address the tasks planned for that day. As part of this task, additional PPE may be assigned to reflect site-specific conditions or special considerations or conditions associated with any identified task.</p>	<p>Personnel Decontamination - A structured decontamination is not required as the likelihood of encountering contaminated media is considered remote. However, survey parties should inspect themselves and one another for the presence of ticks when exiting wooded areas, grassy fields, etc. This action will be employed to stop the transfer of these insects into vehicles, homes, and offices. In addition, early detection shall provide for early removal.</p>

6.0 HAZARD ASSESSMENT

This section provides information regarding the chemical, physical, and natural hazards associated with the sites to be investigated and the activities that are to be conducted as part of the scope of work. Table 6-1 provides information on potential chemical contaminants, including exposure limits, symptoms of exposure, physical properties, and air monitoring and sampling data.

6.1 CHEMICAL HAZARDS

The potential health hazards associated with NAS Pensacola include inhalation, ingestion, and dermal contact of various contaminants that may be present in shallow and deep soils and groundwater. As the focus of this field investigation is to sample various media, concentrations of the potential contaminants of concern have been not fully determined. Based on the site history and the most recent sampling efforts, the types of contaminants that may be anticipated include the following:

- Volatile Organic Compounds (VOCs), including low concentrations of chlorinated solvents such as Tetrachloroethylene (PCE) and Trichloroethylene (TCE).

However, evaluations of the previously-collected data demonstrate that none of the previously-detected contaminants are likely to be encountered in airborne concentrations that would represent an inhalation concern to onsite workers. This route of exposure will be monitored through the use of direct-reading monitoring instruments, action levels, and other controls specified in this HASP. The other potential routes of exposure will be controlled through the use of appropriate PPE, good personal hygiene and decontamination activities, and by observing site requirements and prohibitions specified in this HASP.

Information on the toxicological, chemical, and physical properties of the potential contaminants of concern is addressed in Table 6-1 of this HASP. It is anticipated that the greatest potential for exposure to site contaminants is during activities in which contact with potential contaminated media exists (soil boring, monitoring well installations, sampling activities, etc.).

TABLE 6-1
CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA
NAS PENSACOLA, FLORIDA

Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Tetrachloroethylene See also Perchloroethylene PERK PCE	127-18-4	PID: I.P. 9.32 eV, relative response ratio 200% with 10.6 eV lamp. FID: 70% relative response ratio with a FID.	Air sample using charcoal tube; carbon disulfide desorption; GC/FID detection. Sampling and analytical protocol shall proceed in accordance with OSHA Method #07, or NIOSH Method #1003.	OSHA: 100 ppm 200 ppm Ceiling; 300 ppm 5-minute max peak in any 3-hr period. ACGIH: 5 ppm 10 ppm STEL IDLH: 150 ppm	Odor threshold for this substance has been determined to be at airborne concentrations of approximately 47 ppm, which is considered adequate. APR with organic vapor/acid gas cartridges should be used for escape purposes only. Exceedances over the recommended exposure limits requires the use of airline or airline/APR combination units. Recommended glove: Viton, PV alcohol 5-16 hrs; silver shield >6.00 hrs; teflon 10-24 hrs; and Nitrile in that order. The breakthrough time for the nitrile glove ranges between 1.5 - 5.5 hrs. during complete immersion.	Boiling Pt: 250 °F; 121°C Melting Pt: -2°F; 19°C Solubility: 0.02% Flash Pt: Not available LEL/LFL: Not available UEL/UFL: Not available Vapor Density: 5.83 Vapor Pressure: 14 mmHg @ 77°F; 25 °C Specific Gravity: 1.62 @ 77°F; 25°C Incompatibilities: Strong oxidizers, alkalis, fuming sulfuric acid, and chemically active metals. When heated to decomposition temperatures will emit toxic fumes of chlorine. Appearance and Odor: Colorless liquid with a mild chloroform like odor.	Overexposure may result in irritation to eyes, nose, throat, and skin. Potential CNS effects including sleepiness, incoordination, headaches, hallucinations, distorted perceptions, and stupor (narcosis). Systemically, symptoms may result in nausea, vomiting, weakness, tremors, and cramps. Chronic exposures may result in dermatitis, enlarged tender liver, kidney, and lung damage. This material is considered a animal carcinogen (liver tumors), however, inadequate evidence exists concerning carcinogenic potential in humans.
Trichloroethylene TCE	79-01-6	PID: I.P. 9.45 eV, High response with PID and 10.2 eV lamp. FID: 70% Response with FID.	Air sample using charcoal tube; carbon disulfide desorption; Sampling and analytical protocol shall proceed in accordance with OSHA Method #07, or NIOSH Method #1022 or #1003.	OSHA: 100 ppm 200 ppm Ceiling; 300 ppm 5-minute max peak in any 2-hr period. ACGIH: 50 ppm 100 ppm STEL NIOSH: 25 ppm IDLH: 1000 ppm	Inadequate - Odor threshold 82 ppm. APRs with organic vapor/acid gas cartridges may be used for escape purposes. Exceedances over the exposure limits require the use of positive pressure-demand supplied air respirator. Recommended gloves: PV Alcohol unsupported >16.00 hrs; Silver shield >6.00 hrs; Teflon >24.00 hrs; or Viton >24.00 hrs; Nitrile (Useable time limit 0.5 hr, complete submersion for the nitrile selection)	Boiling Pt: 188°F; 86.7°C Melting Pt: -99°F; -73°C Solubility: 0.1% @ 77°F; 25°C Flash Pt: 90°F; 32°C LEL/LFL: 8% @ 77°F; 25°C UEL/UFL: 10.5 @ 77°F; 25°C Vapor Density: 4.53 Vapor Pressure: 100 mmHg @ 90°F; 32 °C Specific Gravity: 1.46 Incompatibilities: Strong caustics and alkalis, chemically active metals (barium, lithium, sodium, magnesium, titanium, and beryllium) Appearance and Odor: Colorless liquid with a chloroform type odor. Combustible liquid, however, burns with difficulty.	Central nervous system effects including euphoria, analgesia, anesthesia, paresthesia, headaches, tremors, vertigo, and somnolence. Damage to the liver, kidneys, heart, lungs, and skin have also been reported. Contact may result in irritation to the eyes, skin, and mucous membranes. Ingestion may result in GI disturbances including nausea, and vomiting NIOSH lists this substance a potential human carcinogen.

6.2 PHYSICAL HAZARDS

In addition to the chemical hazards discussed above, the following physical hazards may be present during the performance of the site activities.

- Slips, trips, and falls
- Cuts (or other injuries associated with hand tool use)
- Lifting (strain/muscle pulls)
- Ambient temperature extremes (heat stress)
- Pinches and compressions
- Heavy equipment hazards (rotating equipment, hydraulic lines, etc.)
- Energized systems (contact with underground or overhead utilities)
- Vehicular and foot traffic
- Noise in excess of 85 dBA
- Flying projectiles

Each of these physical hazards is discussed in greater detail in Section 4.0 of the TtNUS health and Safety Guidance Manual. Additionally, information on the associated control measures for these hazards are discussed in Table 5-1 of this HASP.

6.3 NATURAL HAZARDS

Insect/animal bites and stings, poisonous plants, and inclement weather are natural hazards that may be present given the location of activities to be conducted. As previously discussed, this area is well maintained and therefore hazards of this nature are not considered predominant hazards. It should be noted that activities along the water may increase the potential to encounter snakes, insects - ticks, bees, mosquitoes, snakes, alligators, and poisonous vegetation.

For more information concerning these hazards see Section 4.0 of the HSGM. The following information is specific to the region and therefore not in the HSGM.

6.3.1 Insect Bites and Stings

Various insects and animals may be present and should be considered. For example, fire ants present a unique situation when working outdoors in the southern portion of the United States. Their aggressive behavior and their ability to sting repeatedly can pose a unique health threat. The sting injects venom (formic acid) that causes an extreme burning sensation. Pustules form which can become infected if scratched. Allergic reactions of people sensitive to the venom include dizziness, swelling, shock and in

extreme cases unconsciousness and death. People exhibiting such symptoms should see a physician. Fire ants can be identified by their habitat. They build mounds in open sunny areas sometimes supported by a wall or shrub. The mound has no external opening. The size of the mound can range from a few inches across to some which are in excess of two feet or more in height and diameter. When disturbed they defend it by swarming out and over the mound, even running up grass blades and sticks.

Insect/animal bites and stings are difficult to control given the climate and environmental setting of NAS Pensacola. However, in an effort to minimize this hazard the following control measures will be implemented where possible.

- Commercially available bug sprays and repellents will be used whenever possible – Products such as Permanone should not be applied directly to the skin due to potential irritation. This product, when permitted for use, should be applied over clothing articles. Products such as DEET can be applied directly to the skin. Follow the manufacturers instructions.
- Where possible, loose-fitting and light-colored clothing with long sleeves should be worn. This will also aid in insect control by providing a barrier between the field person and the insects and to provide easy recognition of crawling insects against the lighter background. Pant legs should be secured to the work-boots using duct tape to prevent access by ticks. Mosquito nets are also recommended for use when commercially available repellents are not permitted.
- Clothing/limited body checks for ticks and other crawling insects should be conducted upon exiting heavily vegetated areas. Workers should perform a more detailed check of themselves when showering in the evening. Ticks prefer moist areas of the body (arm-pits, genitals, etc.) and will migrate to those locations. However, in many of the reported cases attachment has occurred on the back near the shoulders.
- The FOL/SSO will preview access routes and work areas in an effort to identify physical hazards including nesting areas in and around the work sites. These areas will be flagged and communicated to site personnel.
- The FOL/SSO must determine if site personnel (through completion of Medical Data Sheets), suffer allergic reactions to bee and other insect stings and bites. Field crew members who are allergic to bites should have their emergency kit containing antihistamine and a preloaded syringe of epinephrine readily available.

Any allergies (insect bites, bee stings, etc.) must be reported on the Medical Data Sheet and to the SSO.

Tick and Mosquito Transmitted Illnesses and Diseases

Ticks and mosquitoes have been identified in the transmission of diseases including Lyme's disease and malaria. Warm months (Spring through early Fall) are the most predominant time for this hazard. Information concerning Lyme's Disease including recognition, evaluation, tick removal, and control is provided in Section 4.0 of the TtNUS Health and Safety Guidance Manual.

Malaria may occur when a mosquito or other infected insect sucks blood from an infected person, and the insect becomes the carrier to infect other hosts. The parasite reproduces within the mosquito, and is then passed on to another person through the biting action. Acute symptoms include chills accompanied by fever and general flu like symptoms. This generally terminates in a sweating stage. These symptoms may recur every 48 to 72 hours.

West Nile Virus (WNV)

The WNV is a type of virus that causes encephalitis or inflammation of the brain. The virus is transmitted by mosquitoes that acquire it from infected birds. Symptoms generally occur five to 15 days following the bite of an infected mosquito, and range from a slight fever or headache to rapid onset of severe headache, high fever, stiff neck, muscle weakness, disorientation and death.

WNV encephalitis has no specific treatment. In northern areas of the world, WNV encephalitis cases occur primarily in the late summer or early fall. In southern climates, where temperatures are milder, WN encephalitis can occur year round. There is no vaccine.

Precautions include:

- Limit outdoor activities during peak mosquito times – at dusk and dawn.
- Avoid standing water
- Wear long-sleeved shirts and long pants whenever you are outdoors.
- Apply insect repellent according to manufacturers instruction to exposed skin. An effective repellent will contain 20% to 30% DEET (N,N-diethyl-meta-toluamide). Avoid products containing more than 30% DEET.
- Spray clothing with repellents containing permethrin or DEET, mosquitoes may bite through thin clothing.

6.3.2 Snakes of Florida

The poisonous snakes found in Florida are the coral snake, cottonmouth or water moccasin, copperhead, and the pygmy, timber, and diamondback rattlesnakes. Initial efforts will be directed to avoid, where possible, nesting and territorial areas. Again, it is not anticipated that these reptiles will be encountered the following is provided only for informational purposes.

Coral Snake

Coral Snakes are extremely poisonous snakes with small, blunt heads and brightly colored bodies. They do not strike as effectively as other venomous snakes, but they bite. They are dangerous if stepped on or handled. The *eastern* coral snake generally ranges from 20 to 40 inches in length. Its body is encircled by broad black and red bands separated by narrow yellow ones. Just behind the snake's black snout is a wide yellow band followed by a black band. Some are covered with black pigment that hides much of the red color. Some nonpoisonous snakes look like coral snakes because they have similar coloring. But coral snakes have red bands next to yellow ones. The harmless snakes have red bands next to black ones.

Cotton Mouth or Water Moccasin

The water moccasin is a pit viper. It has a hollow, or pit, in the side of its head, between and slightly below the eye and nostril. Several harmless water snakes have a broad head like the moccasin, but they lack the pit. Adult water moccasins are about 3 ½ feet long, though some grow to more than 5 feet long. They usually have broad dark bands across their bodies. Water moccasins feed on a wide variety of animals, including frogs, fish, small mammals, and birds. Water moccasins are most often seen in watery places, in the swampy backwaters of rivers and streams, and on marshy lakeshores. The bite of the water moccasin is highly dangerous and may be fatal. This snake is also called a cottonmouth because when threatened it throws back its head and flashes its white-lined mouth as a warning signal.

Copperhead

Copperhead is also a poisonous pit viper. Its body has broad chestnut-red bands. Most copperheads are about 2 ½ feet long while the largest grow to about 4 feet. The copperhead bites people more often than most rattlesnakes, partly because it is silent and smaller, and is not so quickly noticed. The bite is seldom fatal to adults. This reptile usually eats rodents and other small mammals by killing them with their poison and swallowing them whole. Sometimes the snake eats insects and frogs. The copperhead can be identified by the presence of a pit in front of and below each eye. The snake's nostril is in front of the pit.

Rattlesnake

The rattlesnake is a pit viper with a rattle on the end of its tail. The rattle is used to warn enemies to stay away. However, sometimes they give no warning before they bite. The rattlesnake always lifts its tail when it sounds where as harmless snakes that mimic the rattlesnake move their tail back and forth on top of dry leaves or grass.

The diamondback rattler is the heaviest of the poisonous snakes, though not the longest. It gets its name because diamond-shaped blotches edged with yellow cover its body. Diamondbacks rarely grow over feet long.

Pigmy rattlesnakes are short, relatively thick-bodied snakes. They have a dark line through the eye on each side of the face and a series of dark, roughly circular spots running down the center of the back. These dorsal spots interrupt a thin reddish-orange stripe that runs along the midbody line. Pigmy rattlesnakes first line of defense is to remain motionless. Their color pattern makes them hard to see in grass or leaf litter, especially when they are coiled. They almost never warn approaching people by sounding their rattle. They are likely to remain motionless until stepped on or over.

The Timber Rattlesnake has a large body and ranges in length of five to six feet. It has a broad triangular head, vertical pupils and heat sensitive pits. The body color may be yellow, gray, dark brown or black, with dark, V-shaped crossbands across the back. The head is usually unpatterned and is covered with many small scales. A distinct rattle on the end of a darkly colored tail produces a buzzing sound when vibrated.

Rattlesnakes send out poison through two long hollow fangs, in its upper jaw. The poison forms in a pair of glands behind each eye on the upper jaw. The rattlesnake's fangs are folded back in the mouth when not in use. When an angry rattlesnake strikes, the fangs are erected and the mouth opened wide. Most rattlesnakes eat birds, small mammals, amphibians and reptiles. The larger rattlers rank among the most dangerous of snakes and should be avoided

Snake Bite

However, should field personnel come in contact with these animals and receive a bite, the following actions are necessary:

- Obtain a detailed description of the snake. This and the bite mark will enable medical personnel administering medical aid to provide prompt and correct antidotes, as necessary.

- Immobilize the bite victim to the extent possible. Physical exertion will mobilize the toxins (if poisonous varieties) from the bite point systemically through the body.
- Apply a pressure wrap (for extremities), just above and over the bite area. With a couple wraps of the pressure wrap in place over the bite area, apply a splint, and continue the application of the pressure wrap. The purpose for the splint is to restrict the movement of the extremity, this along with the pressure wrap will aid in restricting the toxins from leaving the site of the bite.
- Seek medical attention immediately.

6.3.3 Inclement 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, extreme heat and/or cold, etc.), the FOL and/or the SSO will be responsible for temporarily suspending or terminating activities until hazardous conditions no longer exist.

6.3.4 Heat Strain Symptoms

Excessive temperature extremes are considered inclement weather. Given the location and time of the year that work is to be conducted Table 6-4 is provided as a guide to Heat Strain Symptoms.

TABLE 6-2
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	> 101.3°F (38.5° C)
Recovery Heart Rate	> 110 bpm (Measured 1 minute after peak work effort)
Other symptoms	Sudden and sever fatigue, nausea, dizziness, or headache

Individuals May Be At Greater Risk of Heat Stress 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

7.0 AIR MONITORING

Direct Reading Instruments (DRIs) will be used to screen source areas (sample locations, wells, etc.) and worker breathing zones for volatile and detectable site contaminants. Some of the anticipated site contaminants, however, are not volatile and are unable to be detected with the use of DRIs. Specifically, the PAHs, metals, and pesticides are unable to be detected due to their solid nature, low vapor pressure, and/or non-ionizing properties. Action levels are discussed in Table 5-1 as they may apply to a specific task or location. The use of personal protective equipment and the observance of the other control requirements presented in this HASP has been selected to minimize potential for personnel exposures to hazardous concentrations (known or unknown) of airborne contaminants. Additionally, the Health and Safety Guidance Manual, Section 1.0, contains detailed information regarding direct reading instrumentation, as well as general calibration procedures of various instruments.

7.1 INSTRUMENTS AND USE

Instruments will be used primarily to monitor source points and worker breathing zone areas, while observing instrument action levels. Action levels are discussed in Table 5-1 as they may apply to a specific task or location.

7.1.1 Flame Ionization Detector

In order to accurately monitor for any substances which may present an exposure potential to site personnel, a Flame Ionization Detector (FID) will be used. This instrument will be used to monitor potential source areas and to screen the breathing zones of employees during site activities. The FID has been selected because it is capable of detecting the organic vapors of concern.

Prior to the commencement of any field activities, the background levels of the site must be determined and noted. Daily background readings will be taken away from any areas of potential contamination. These readings, any influencing conditions (i.e., weather, temperature, humidity) and site location must be documented in the field operations logbook or other site documentation (e.g., sample log sheet).

7.1.2 Hazard Monitoring Frequency

Table 5-1 presents the frequencies that hazard monitoring will be performed as well as the action levels which will initiate the use of elevated levels of protection. The SSO may decide to increase these frequencies based on instrument responses and site observations. The frequency at which monitoring is performed will not be reduced without the prior consent of the PHSO or HSM.

7.2 INSTRUMENT MAINTENANCE AND CALIBRATION

Hazard monitoring instruments will be maintained and pre-field calibrated by the TtNUS Equipment Manager. Operational checks and field calibration will be performed on all instruments each day prior to their use. Field calibration will be performed on instruments according to manufacturer's recommendations (for example, the FID must be field calibrated daily and an additional field calibration must be performed at the end of each day to determine any significant instrument drift). These operational checks and calibration efforts will be performed in a manner that complies with the employees health and safety training, the manufacturer's recommendations, and with the applicable manufacturer standard operating procedure (copies of which can be found in the Health & Safety Guidance Manual which will be maintained on site for reference). All calibration efforts must be documented. Figure 7-1 is provided for documenting these calibration efforts. This information may instead be recorded in a field operations logbook, provided that all of the information specified in Figure 7-1 is recorded. This required information includes the following:

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

8.0 TRAINING/MEDICAL SURVEILLANCE REQUIREMENTS

8.1 INTRODUCTORY/REFRESHER/SUPERVISORY TRAINING

This section specifies health and safety training and medical surveillance requirements for both Tetra Tech NUS and subcontractor personnel participating in on site activities.

8.1.1 Training Requirements For Tetra Tech NUS, Inc. and Subcontractor Personnel

Tetra Tech NUS and subcontractor personnel who will engage in field associated activities as described in this HASP must have:

- Completed 40 hours of introductory hazardous waste site training or equivalent work experience as defined in OSHA Standard 29 CFR 1910.120(e).
- Completed 8-Hour Refresher Training, if the identified persons had introductory training more than 12 months prior to site work.
- Completed 8-hour Supervisory training in accordance with 29 CFR 1910.120(e)(4), if their assigned function will involve the supervision of subordinate personnel.

Documentation of introductory training or equivalent work experience, 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.

8.2 SITE-SPECIFIC TRAINING

Tetra Tech NUS will provide site-specific training to Tetra Tech NUS employees and subcontractor personnel who will perform work on this project.

Figure 8-1 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.

TtNUS will conduct a pre-activities training session prior to initiating site work. Additionally, a brief meeting will be held daily to discuss operations planned for that day. At the end of the workday, a short meeting may be held to discuss the operations completed and any problems encountered. This activity will be supported through the use of a Safe Work Permit System (See Section 10.2).

8.3 MEDICAL SURVEILLANCE

8.3.1 Medical Surveillance Requirements for Tetra Tech NUS and Subcontractor Personnel

Tetra Tech NUS and subcontractor personnel participating in project field activities will have had a physical examination. Physical examinations shall meet the minimum requirements of paragraph (f) of OSHA 29 CFR 1910.120. The physical examinations will be performed to ensure that personnel are medically qualified to perform hazardous waste site work using respiratory protection.

Documentation for medical clearances will be maintained at the job site and made available, as necessary. Subcontractor personnel may use an alternative documentation for this purpose. The "Subcontractor Medical Approval Form" can be used to satisfy this requirement, or a letter from an officer of the company. The letter should state that the persons listed in the letter participate in a medical surveillance program meeting the requirements contained in paragraph (f) of Title 29 of the Code of Federal Regulations (CFR), Part 1910.120, entitled "Hazardous Waste Operations and Emergency Response." The letter should further state the following:

- The persons listed have had physical examinations under this program within the frequency as determined sufficient by their occupational health care provider
- Date of the exam
- The persons identified have been cleared, by a licensed physician, to perform hazardous waste site work and to wear positive- and negative- pressure respiratory protection.

A sample Subcontractor Medical Approval Form and form letter have been provided to eligible subcontractors in the Bid Specification package.

8.3.2 Medical Data Sheet

Each field team member, including subcontractors and visitors, entering the exclusion zone(s) shall be required to complete and submit a copy of the Medical Data Sheet that is available in Attachment V of this HASP. This shall be provided to the SSO, prior to participating in site activities. The purpose of this document is to provide site personnel and emergency responders with additional information that may be necessary in order to administer medical attention.

8.4 SUBCONTRACTOR EXCEPTION

If through the execution of their contract elements the subcontractor will not enter the exclusion zone and there is no potential for exposure to site contaminants, subcontractor personnel may be exempt from the

training and medical surveillance requirements with the exception of Section 8.2. Examples of subcontractors who may qualify as exempt from training and medical surveillance requirements may include surveyors who perform surveying activities in site perimeter areas or areas where there is no potential for exposure to site contaminants and support or restoration services. **Use of this Subcontractor Exception is strictly limited to the authority of the CLEAN Health and Safety Manager.**

9.0 SPILL PREVENTION AND CONTAINMENT PROGRAM

9.1 SCOPE AND APPLICATION

This program applies to the single or aggregate accumulation of bulk storage materials (over 55-gallons). As the classification of certain materials such as IDW is unknown, these materials will be treated as hazardous, pending laboratory certification to the contrary. The types of materials for which this program will apply are as follows:

- Investigative Derived Wastes (IDW) such as decontamination fluids, soil cuttings, and purge and well development waters
- Resource Storage – Limited fuel and lubricant storage

The spill containment and control will be engaged any time there is a release of the above-identified materials from a containment system or vessel. This spill containment program will be engaged in order to minimize associated hazards.

9.2 POTENTIAL SPILL AREAS

Potential spill areas will be periodically monitored in an ongoing attempt to prevent and control further potential contamination of the environment. Currently, limited areas are vulnerable to this hazard including:

- Resource deployment
- Waste transfer
- Central staging

It is anticipated that the IDW generated as a result of this scope of work will be containerized, labeled, and staged to await further analyses. The results of these analyses will determine the method of disposal.

9.3 CONTAINMENT AREAS

In order to facilitate leak and spill inspection and response, and to minimize potential hazards which may impact the integrity of the storage containers, the staging area for these substances will be structured as follows:

9.3.1 IDW

- 55 Gallon Drums (United Nations 1A2 configurations) – 4 Drums to a Pallet; labels and the retaining ring bolt and nut on the outside of each drum to facilitate easy access; Minimum 4-feet between each row of pallets. The decision to construct a bermed and lined area will be the decision of project management. It is currently planned only to drum purge/development/decontamination generated wash waters. Soil cuttings are to be placed in a roll-off container.
- Roll-off containers –roll-off boxes will be lined and contain a with a sealable gate. When not in use the roll-off will remain covered to prevent rain water from collecting within the box during rain events. Care should be taken not to overload the roll-off Box. Sandy soil will average (depending on % sand and moisture) between 2500 and 3000 lbs/yd³ .

Regardless of container types selected, the staging area will be identified as a Satellite Storage Area with proper signage, points of contact in the event of an emergency, alternate contacts, and identification of stored material (i.e., Purge or decontamination waters, soil cuttings, etc.).

An Inventory Log will be maintained by the FOL regarding types of IDW and volumes generated. An updated Inventory List will be provided by the FOL to the designated Emergency Response Agency or Facility Contact during days off and between shifts or phases of operations.

9.3.2 Flammable/POL Storage

Flammable Storage [i.e., fuels, decontamination solvents (Isopropanol)] and Petroleum/oil/lubricants (POL) will require proper dispensing containers and necessary storage for cumulative volumes in excess of 25 gallons. Storage and dispensing will comply with the following requirements:

- Fuels dispensed from portable containers, will utilize safety cans.
- Portable hand held storage containers will be labeled per Hazard Communication requirements.
- Larger volumes stored for fueling equipment will be stored in approved mobile Above Ground Storage Tanks with secondary containment capable of holding the tank volume plus 10%.
- Portable flammable liquid storage tanks will be properly grounded and will have bonding capabilities for the transfer of loading and off-loading of its contents.
- Dispensing locations will be supported by a Fire Extinguisher positioned no closer than 50 feet from the storage tank, properly mounted and identified.
- The storage location will be well marked with proper signage, protective bumper poles and will have straight through access/egress for vehicles.

9.4 MATERIALS HANDLING

To minimize the hazards associated with moving drums and containers (i.e, lifting, pinch and compression points) material handling will be supported in the following manner:

- A drum cart with pneumatic tires will be required, if drums are to be moved at the IDW storage area. This cart will be used to relocate drums within the staging and satellite storage location.
- In addition, a mechanized means such as a suitably equipped skid loader or back-hoe will be provided to move IDW containers from the field location to the staging and satellite storage location. This piece of equipment will also be used in site clearance and restoration as deemed appropriate and necessary. It is anticipated that this piece of equipment will also be used to load, transport, and dump soils into the roll-off box.

Other means of material handling will be evaluated by the SSO based on their ability to minimize or eliminate material handling hazards.

9.5 LEAK AND SPILL DETECTION

To establish an early detection of potential spills or leaks, a periodic walk-around by the personnel staging or disposing of drums or in the Resource Deployment area will be conducted during working hours to visually determine that storage vessels are not leaking. If a leak is detected, the FOL will be notified and the Spill Containment/Control Response Plan as specified in Section 9.8 will be engaged. Inspections will be documented in the project logbook.

9.6 PERSONNEL TRAINING AND SPILL PREVENTION

Personnel will be instructed in the procedures for incipient 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 Coordinators for this operation, should the need arise. The FOL shall identify two members (at least two) of the project team as the Incidental Spill Response Team. Should an incidental spill occur these individuals will engage incident response measures. It shall be the responsibility of these individuals to insure they have the supplies and equipment specified in Section 9.7 to support this function. Insufficient supplies or resources should be reported to the FOL.

9.7 SPILL PREVENTION AND CONTAINMENT EQUIPMENT

The following represents the minimum equipment that will always be maintained at the staging areas the purpose of supporting this Spill Containment/Control Plan.

- Sand, clean fill, vermiculite, or other non combustible absorbent (Oil-dry)
- Extra Drums (55-gallon U.N. 1A2) should the need to transfer material from leaking containers arise.
- Pumps (Gas or Electric necessary for transferring liquids from leaking containers)/tubing
- Shovels, rakes, and brooms
- Container labels
- Personal Protective Equipment
 - Nitrile outer gloves
 - Splash Shield
 - Impermeable over-boots
 - Rain suit

9.8 SPILL CONTAINMENT/CONTROL RESPONSE PLAN

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

- Notify the SSO or FOL immediately upon detection of a leak or spill.
- Employ the personal protective equipment stored at the staging area. Initiate incidental spill response measures. Take immediate actions to stop the leak or spill by plugging or patching the container or raising the leak to the highest point in the vessel. Spread the absorbent material in the area of the spill, covering it completely.
- Transfer the material to a new vessel; collect and containerize the absorbent material. Label the new container appropriately. Await analyses for treatment and disposal options.
- Re-containerize spills, including 2-inch of top cover (if over soils) impacted by the spill. Await test results for treatment or disposal options.
- If the spill cannot be controlled or contained, initiate emergency alerting procedures for that area to remove non-essential personnel.

It is not anticipated that a spill will occur that the field crew cannot handle. Should this occur, notification of the appropriate Emergency Response agencies will be carried out by the FOL or SSO in accordance with the procedures specified in Section 2.0 of this HASP.

10.0 SITE OPERATIONS AND CONTROL

Site operations and control will be facilitated through the use of established work zones and security and control of those zones. These activities will minimize the impact and spread of contaminants brought to the surface through subsurface investigative methods as well as protect personnel and visitors within these zones during ongoing operations.

10.1 WORK ZONES

Tetra Tech NUS will delineate and use work zones in conjunction with decontamination procedures to prevent the spread of contaminants to other areas of the site. A three-zone approach will be used for work at this site; an Exclusion Zone, a Contamination Reduction Zone, and a Support Zone. These will be used to control access to the work areas, restricting the general public, avoiding potentials to spread any contaminants, and to protect individuals who are not cleared to enter by way of training and/or medical surveillance qualifications.

10.1.1 Exclusion Zone

An Exclusion Zone will be established at each sampling point/location. The purpose of the exclusion zone is to define a area where a more rigorous protocol for workers within what is determined to be an impact area. The impact area is that area which could be adversely impacted by either chemical or physical hazards. Exclusion zone size and dimensions will vary based on activities. Impact areas dimensions will be influenced by the following considerations:

- Physical and topographical features of the site
- Weather conditions
- Field and analytical measurements of air and environmental contaminants
- Air dispersion calculations
- Potential for explosion and dispersion
- Physical, chemical and toxicological properties of the contaminants being investigated
- Tasks to be conducted
- Decontamination procedures
- Potential for exposure

As conditions change the dimensions of the exclusion zone will change. However, the following dimensions represent a starting point from which the exclusion zones will be expanded:

- DPT - Soil Boring. The exclusion zone for this activity will be set at the height of the mast, plus five feet surrounding the point of operation, with a minimum of 25-feet. This distance will also apply when surface and subsurface soil sampling from behind these type rigs.
- HSA – Monitoring Well Installation. The exclusion zone for this activity will be set at the height of the mast, plus five feet surrounding the point of operation, or 35-feet, whichever is greater.
- Monitoring well development, sampling, aquifer testing. The exclusion zone for this activity will be set at 10-feet surrounding the well head and discharge collection container.
- Decontamination operation. The exclusion zone for this activity will be set at 25 feet surrounding the gross contamination wash and rinse as well as 25-feet surrounding the heavy equipment decontamination area.
- Investigative Derived Waste (IDW) area will be constructed and barricaded. Only authorized personnel will be allowed access.

Exclusion zones shall remain marked until the SSO has evaluated the restoration effort and has authorized changing the zone status.

Exclusion zones will be marked using barrier tape, traffic cones and/or drive poles. Signs will be posted to inform and direct site personnel and site visitors.

10.1.2 Contamination Reduction Zone

The contamination reduction zone will be split to represent two separate functions. The first function will be a control/supply point for supporting exclusion zone activities. The second function, which may take place a sufficient distance from the exclusion zone is the decontamination of personnel and heavy equipment.

In order to move from the exclusion zone to a separate location the following activities will be used:

- As samplers move from location to location during sampling activities, dedicated sampling devices and PPE will be washed of gross contamination, removed, separated, and bagged. Personnel will use hygienic wipes,

such as Handy Wipes, as necessary for personnel decontamination until they can access the centralized decontamination unit. At the first available opportunity personnel will wash their face and hands. This is critical prior to breaks and lunch when contamination can be transferred to the mouth through hand to mouth contact.

- Muddy over-boots and gloves may be required to go through a gross contamination wash at the exclusion zone. These items will then be cleaned thoroughly at the centralized decontamination unit.
- Potentially contaminated tooling along with PPE will be wrapped, when necessary, for transport to the decontamination area. These items will be disposed of as general refuse.
- Upon completion of the assigned tasks the personnel will move through the central decontamination area to clean reusable PPE and field equipment. Based on ambient conditions medical evaluations may take place at the termination point of the decontamination line. These evaluations will include pulse rate, oral temperature, breathing rate to evaluate physiological demands on site personnel. As stated earlier, these evaluations will be based on ambient conditions and acclimation periods.

10.1.3 Support Zone

The Support Zone will consist of a field trailer, storage, lay-down areas, or some other uncontaminated, controlled point. The Support Zone for this project will include a staging area where site vehicles can be parked, equipment will be unloaded, and where food and drink containers will be maintained. The support zones will be established in clean areas of the site.

10.2 SAFE WORK PERMITS

Exclusion Zone work conducted in support of this project will be performed using Safe Work Permits to guide and direct field crews on a task by task basis. An example of the Safe Work Permit is included in Figure 10-1. The daily meetings conducted by the FOL/SSO will further support these work permits. The use of these permits will ensure that site-specific considerations and changing conditions are incorporated into the planning effort. Safe Work Permits will require the signatures of either the FOL or the SSO. Personnel engaged in on-site activities must be made aware of the elements indicating levels of protection and precautionary measures to be used.

The use of these permits will establish and provide for reviewing protective measures and hazards associated with each operation. This HASP will be used as the primary reference for selecting levels of protection and

control measures. The Safe Work Permit will take precedence over the HASP when more conservative measures are required based on specific site conditions.

Upon completion of the work for which the Safe Work Permit was assigned, the Safe Work Permit will be turned into the FOL or the SSO. Concerns, complaints, and suggestions may be made on the reverse of the Safe Work Permit for consideration by the FOL and/or the SSO. Permits turned in with suggestions, difficulties, or complaints will be forwarded to the PHSO for review.

The Safe Work Permit and the HASP will serve as the primary reference for work place evaluations and audits conducted to determine if the task is being conducted under the direction conveyed by the HASP and the Safe Work Permit.

10.3 SITE MAP

Once the areas of contamination, access routes, topography, dispersion routes are determined, a site map will be generated and adjusted as site conditions change. This map will be posted to illustrate up-to-date information of contaminants and adjustment of zones and access points. This map will be posted at the field support trailer.

10.4 BUDDY SYSTEM

Personnel engaged in on-site activities will practice the "buddy system" to ensure the safety of the personnel involved in this operation.

**FIGURE 10-1
SAFE WORK PERMIT**

Permit No. _____ Date: _____ Time: From _____ to _____

I. Work limited to the following (description, area, equipment used): _____

II. Primary Hazards: Potential hazards associated with this task: _____

III. Field Crew: _____

IV. On-site Inspection conducted Yes No Initials of Inspector _____ TtNUS
Equipment Inspection required Yes No Initials of Inspector _____ TtNUS

V. Protective equipment required **Respiratory equipment required**
 Level D Level B Yes Specify on the reverse
 Level C Level A No
 Modifications/Exceptions: _____

VI. Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Primary Route(s) of Exposure/Hazard: _____

(Note to FOL and/or SSO: Each item in Sections VII, VIII, and IX must be checked Yes, No, or NA)

VII. Additional Safety Equipment/Procedures

Hard-hat	<input type="checkbox"/> Yes <input type="checkbox"/> No	Hearing Protection (Plugs/Muffs)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Safety Glasses	<input type="checkbox"/> Yes <input type="checkbox"/> No	Safety belt/harness	<input type="checkbox"/> Yes <input type="checkbox"/> No
Chemical/splash goggles	<input type="checkbox"/> Yes <input type="checkbox"/> No	Radio/Cellular Phone	<input type="checkbox"/> Yes <input type="checkbox"/> No
Splash Shield	<input type="checkbox"/> Yes <input type="checkbox"/> No	Barricades	<input type="checkbox"/> Yes <input type="checkbox"/> No
Splash suits/coveralls.....	<input type="checkbox"/> Yes <input type="checkbox"/> No	Gloves (Type – Work)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Impermeable apron	<input type="checkbox"/> Yes <input type="checkbox"/> No	Work/rest regimen.....	<input type="checkbox"/> Yes <input type="checkbox"/> No
Steel toe work shoes or boots	<input type="checkbox"/> Yes <input type="checkbox"/> No	Chemical Resistant Boot Covers	<input type="checkbox"/> Yes <input type="checkbox"/> No
High Visibility vest	<input type="checkbox"/> Yes <input type="checkbox"/> No	Tape up/use insect repellent	<input type="checkbox"/> Yes <input type="checkbox"/> No
First Aid Kit.....	<input type="checkbox"/> Yes <input type="checkbox"/> No	Fire Extinguisher	<input type="checkbox"/> Yes <input type="checkbox"/> No
Safety Shower/Eyewash.....	<input type="checkbox"/> Yes <input type="checkbox"/> No	Other	<input type="checkbox"/> Yes <input type="checkbox"/> No

Modifications/Exceptions: _____

VIII. Site Preparation

	Yes	No	NA
Utility Locating and Excavation Clearance completed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vehicle and Foot Traffic Routes Established/Traffic Control Barricades/Signs in Place.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Physical Hazards Identified and Isolated (Splash and containment barriers).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emergency Equipment Staged (Spill control, fire extinguishers, first aid kits, etc).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IX. Additional Permits required (Hot work, confined space entry, excavation etc.)..... Yes No
 If yes, SSO to complete or contact Health Sciences, Pittsburgh Office (412)921-7090

X. Special instructions, precautions: _____

Permit Issued by: _____ Permit Accepted by: _____

10.5 MATERIAL SAFETY DATA SHEET (MSDS) REQUIREMENTS

Tetra Tech NUS 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. The MSDSs will be maintained in a central location (i.e., temporary office) and will be available for anyone to review upon request. The SSO will be responsible for implementing a site-specific Hazard Communication Program (See Section 5.0 of the TtNUS Health and Safety Guidance Manual). This includes collection of MSDSs, creation and maintenance of an accurate Chemical Inventory Listing, addressing container labeling and personnel training issues, and other aspects of Hazard Communication.

10.6 COMMUNICATION

It is anticipated that site personnel will be working in close proximity during proposed field activities. In the event that site personnel are in isolated areas or are separated by significant distances, a supported means of communication between field crews will be utilized. Two-way radio communication devices, if needed, will be used only with NAS Pensacola approval.

External communications will be accomplished utilizing telephones at predetermined and approved locations or through cellular phones. External communication will primarily be used for the purpose of resource and emergency resource communications. Prior to the commencement of site activities, the FOL will determine and arrange for telephone communications, if it is determined a cellular means will not be used. Cellular communications will be tested to ensure adequate coverage from the areas of operation. If not provisions for external communication will be made prior to the commencement of site activities.

10.7 SITE VISITORS

Potential site visitors that may be encountered during the performance of the field work could include the following:

- Personnel invited to observe or participate in operations by Tetra Tech NUS.
- Regulatory personnel (i.e., DOD, FDEP, EPA, OSHA, etc.)
- Southern Division Navy personnel
- Other authorized visitors

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

Once access to the base is obtained, personnel who require access to Tetra Tech NUS work sites (areas of ongoing operations) will be required to obtain permission from the FOL and the Base Contact. Upon gaining access to the work site, site visitors wishing to observe operations in progress will be required to meet the minimum requirements as stipulated below.

- Site visitors will be routed to the FOL, who will sign them into the field logbook. Information to be recorded in the logbook will include the individuals name (proper identification required), who they represent, and the purpose for the visit. The FOL is responsible for ensuring that site visitors are always escorted while on site.
- Site visitors will be required to produce the necessary information supporting clearance on to the site. This includes information attesting to applicable training (40-hours of HAZWOPER training required for Southern Division Navy Personnel), and medical surveillance as stipulated in Section 8.3, of this document. In addition, to enter the sites operational zones during planned activities, visitors will be required to first go through site-specific training covering the topics stipulated in Section 8.2 of this HASP.

Once the site visitors have completed the above items they will be permitted to enter the site and applicable operational areas. Visitors are required to observe the protective equipment and site restrictions in effect at the work areas visited. Any visitors not meeting the requirements as stipulated in this plan for site clearance will not be permitted to enter the site operational zones during planned activities. Any incidence of unauthorized site visitation will cause on-site activities to be terminated until that visitor can be removed. Removal of unauthorized visitors will be accomplished with support from the Base Contact, if necessary. At a minimum, the Base Contact will be notified of any unauthorized visitors.

10.8 SITE SECURITY

As this activity will take place at a Navy facility, the first line of security will be provided by the base gate restricting the general public. The second line of security will take place at the work site referring interested parties to the FOL and Base Contact.

Security at the work areas will be accomplished using field personnel. This is a multiple person operation, involving multiple operational zones. Tetra Tech NUS personnel will retain complete control over active operational zones.

The Base Contact will serve as the focal point for base personnel and interested parties and will serve as the primary enforcement contact.

11.0 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 HASP are not allowed, under any circumstances, to enter confined spaces.** A confined space is defined as an area which has the following characteristics:

- Is large enough and so configured that an employee can bodily enter and perform assigned work.
- Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry).
- Is not designed for continuous employee occupancy.

A Permit-Required Confined Space is one that:

- Contains or has a potential to contain a hazardous atmosphere.
- Contains a material that has the potential to engulf an entrant.
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section.
- Contains any other recognized, serious, safety or health hazard.

For further information on confined space, consult the Health and Safety Guidance Manual or call the PHSO. 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, and the HSM will have to be notified.

12.0 MATERIALS AND DOCUMENTATION

The TtNUS FOL shall ensure the following materials/documents are taken to the project site and used when required.

- A complete copy of this HASP
- Health and Safety Guidance Manual
- Incident Reports
- Medical Data Sheets
- Material Safety Data Sheets for chemicals brought on site, including decontamination solutions, fuels, sample preservatives, calibration gases, etc.
- A full-size OSHA Job Safety and Health Poster (posted in the site trailers)
- Training/Medical Surveillance Documentation Form (Blank)
- Emergency Reference Information (Section 2.0, extra copy for posting)

12.1 MATERIALS TO BE POSTED OR MAINTAINED AT THE SITE

The following documentation is to be posted or maintained at the site for quick reference purposes. In situations where posting these documents is not feasible, (such as no office trailer), these documents should be separated and immediately accessible.

Chemical Inventory Listing (posted) - This list represents chemicals brought on-site, including decontamination solutions, sample preservations, fuel, etc.. This list should be posted in a central area.

MSDSs (maintained) - The MSDSs should also be in a central area accessible to site personnel. These documents should match the listings on the chemical inventory list for substances used on-site. It is acceptable to have these documents within a central folder and the chemical inventory as the table of contents.

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.

Site Clearance (maintained) - This list is found within the training section of the HASP (See Figure 8-2). This list identifies site personnel, dates of training (including site-specific training), and medical surveillance. The lists 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.

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

Medical Data Sheets/Cards (maintained) - Medical Data Sheets will be filled out by on-site personnel and filed in a central location. 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 be carried on their person.

Hearing Conservation Standard (29 CFR 1910.95) (posted) - this standard will be posted anytime hearing protection or other noise abatement procedures are employed.

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

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 purpose of maintaining or posting this information, as stated above, is to allow site personnel quick access. Variations concerning location and methods of presentation are acceptable, providing the objection is accomplished.

13.0 GLOSSARY

ACGIH	American Conference of Governmental Industrial Hygienists
CERCLA	Comprehensive Environmental Response Compensation, and Liability Act
CFR	Code of Federal Regulations
CNS	Central Nervous System
CRZ	Contamination Reduction Zone
CTO	Contract Task Order
DPT	Direct-Push Technology
FID	Flame Ionization Detector
FOL	Field Operations Leader
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSA	Hollow Stem Auger
HSM	Health and Safety Manager
IDW	Investigation-derived Waste
MSDS	Material Safety Data Sheet
N/A	Not Available
NAS	Naval Air Station
NIOSH	National Institute Occupational Safety and Health
OSHA	Occupational Safety and Health Administration (U.S. Department of Labor)
PCE	Perchloroethylene or Tetrachloroethylene
PEL	Permissible Exposure Limit
PHSO	Project Health and Safety Officer
PPE	Personal Protective Equipment
SOPs	Standard Operating Procedures
SSO	Site Health and Safety Officer
STEL	Short Term Exposure Limit
TCE	Trichloroethylene
TOM	Task Order Manager
TtNUS	Tetra Tech NUS, Inc.
TWA	Time Weighted Average
VOCs	Volatile Organic Compounds

ATTACHMENT I

INJURY/ILLNESS PROCEDURE AND REPORT FORM

TETRA TECHNUS, INC.

INJURY/ILLNESS PROCEDURE WORKER'S COMPENSATION PROGRAM

WHAT YOU SHOULD DO IF YOU ARE INJURED OR DEVELOP AN ILLNESS AS A RESULT OF YOUR EMPLOYMENT:

- Stop work as needed to ensure no further harm is done.
- If injury is minor, obtain appropriate first aid treatment.
- If injury or illness is severe or life threatening, obtain professional medical treatment at the nearest hospital emergency room. Check with your office location or project health and safety plan for specific instructions.
- If incident involves an injury, illness, or chemical exposure on a project work site, follow instructions in the Health & Safety Plan.
- Immediately report any injury or illness to your supervisor or office manager. In addition, you must contact your Human Resources representative, Marilyn Duffy at (412) 921-8475, and the Corporate Health and Safety Manager, Matt Soltis at (412) 921-8912 within 24 hours of the injury. You will be required to complete an [Injury/Illness Report](#). You may also be required to participate in a more detailed investigation with the Health Sciences Department.
- In the event of a serious near-miss incident, a "Serious Near Miss Report" (Form AR-2, available online at <https://go2.tetratech.com> under "Departments", "Health and Safety", "Accident Reporting Procedures", hyperlink for "Serious Near Miss Report") must be completed and faxed to the Corporate Health and Safety Manager within 48 hours.
- If further medical treatment is needed, our insurance carrier, ACE, will provide information on the authorized providers customized to the location of the injured employee. You can find this information by accessing the website of ACE's claims handler, ESIS, at : www.esis.com. These providers are to be used for treatment of Worker's Compensation injuries subject to the laws of the state in which you work.

ADDITIONAL QUESTIONS REGARDING WORKER'S COMPENSATION:

Contact your local Human Resources representative (Marilyn Duffy), Corporate Health and Safety Manager (Matt Soltis), or Corporate Administration in Pasadena, California, at (626) 351-4664.

Worker's compensation is a state-mandated program that provides medical and disability benefits to employees who become disabled due to job related injury or illness. Tetra Tech, Inc. and its subsidiaries pay premiums on behalf of their employees. This program is based on a no-fault system, and benefits are provided for covered events as an exclusive remedy to the injured employee regardless of fault. The types of injuries or illnesses covered and the amount of

benefits paid are regulated by the state worker's compensation boards and vary from state to state. Corporate Administration in Pasadena is responsible for administering the Company's worker's compensation program. The following is a general explanation of worker's compensation provided in the event that you become injured or develop an illness as a result of your employment with Tetra Tech or any of its subsidiaries. Please be aware that the term used for worker's compensation varies from state to state.

WHO IS COVERED:

All employees of Tetra Tech, whether they are on a full-time, part-time or temporary status, working in an office or in the field, are entitled to worker's compensation benefits from the first day of work. All employees must follow the above injury/illness reporting procedures. If you are working out-of-state and away from your home office, you are still eligible for worker's compensation benefits.

Consultants, independent contractors, and employees of subcontractors and employees from temporary employment agencies are not covered by Tetra Tech's Worker's Compensation plan.

WHAT IS COVERED:

If you are injured or develop an illness caused by your employment, worker's compensation benefits are available to you subject to the laws of the state you work in. Injuries do not have to be serious; even injuries treated by first aid practices are covered and must be reported.



TETRA TECH, INC.

ACCIDENT AND ILLNESS INVESTIGATION REPORT

To: _____
Subsidiary Health and Safety Representative

Prepared by: _____

Position: _____

cc: _____
Workers Compensation Administrator

Office: _____

Project name: _____

Telephone number: _____

Project number: _____

Fax number: _____

Information Regarding Injured or Ill Employee

Name: _____

Office: _____

Home address: _____

Gender: M F No. of dependents: _____

Marital status: _____

Home telephone number: _____

Date of birth: _____

Occupation (regular job title): _____

Social security number: _____

Department: _____

Date of Accident: _____

Time of Accident: _____ a.m. p.m.

Time Employee Began Work: _____

Check if time cannot be determined

Location of Incident

Street address: _____

City, state, and zip code: _____

County: _____

Was place of accident or exposure on employer's premises? Yes No

Information About the Incident

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

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

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



TETRA TECH, INC.

ACCIDENT AND ILLNESS INVESTIGATION REPORT (Continued)

Information About the Incident (Continued)

What was the injury or illness? Describe the part(s) of the body affected and how it was affected. Be more specific than "hurt," "pain," or "sore." Examples "Strained back"; "Chemical burn, right hand"; "Carpal tunnel syndrome, left wrist"

Describe the Object or Substance that Directly Harmed the Employee: Examples: "Concrete floor"; "Chlorine"; "Radial arm saw." If this question does not apply to the incident, write "Not applicable."

Did the employee die? Yes [] No [] Date of death: _____

Was employee performing regular job duties? Yes [] No []

Was safety equipment provided? Yes [] No [] Was safety equipment used? Yes [] No []

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

Witness (Attach additional sheets for other witnesses.)

Name: _____

Company: _____

Street address: _____

City: _____ State: _____ Zip code: _____

Telephone number: _____

Medical Treatment Required? [] Yes [] No [] First aid only

Name of physician or health care professional: _____

If treatment was provided away from the work site, provide the information below.

Facility name: _____

Street address: _____

City: _____ State: _____ Zip code: _____

Telephone number: _____

Was the employee treated in an emergency room? [] Yes [] No

Was the employee hospitalized over night as an in-patient? [] Yes [] No

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



TETRA TECH, INC.

ACCIDENT AND ILLNESS INVESTIGATION REPORT (Continued)

Corrective Action(s) Taken by Unit Reporting the Accident:

Corrective Action Still to be Taken (by whom and when):

Name of Tetra Tech employee the injury or illness was first reported to: _____

Date of Report: _____ **Time of Report:** _____

I have reviewed this investigation report and agree, to the best of my recollection, with its contents.

Printed Name of Injured Employee

Telephone Number

Signature of Injured Employee

Date

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

Title	Printed Name	Signature	Telephone Number	Date
Office Manager				
Project Manager				
Site Safety Coordinator or Office Health and Safety Representative				

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



TETRA TECH, INC.

ACCIDENT AND ILLNESS INVESTIGATION REPORT (Continued)

To Be Completed by the Subsidiary Health and Safety Representative

Classification of Incident:
 Injury Illness

Result of Incident:
 First aid only
 Days away from work
 Remained at work but incident resulted in job transfer or work restriction
 Incident involved days away and job transfer or work restriction
 Medical treatment only

No. of days away from work _____
Date employee left work _____
Date employee returned to work _____
No. of days placed on restriction or job transfer: _____

OSHA Recordable Case Number _____

To Be Completed by Human Resources

Social security number: _____
Date of hire: _____ Hire date for current job: _____
Wage information: \$ _____ per Hour Day Week Month
Position at time of hire: _____
Current position: _____ Shift hours: _____
State in which employee was hired: _____
Status: Full-time Part-time Hours per week: _____ Days per week: _____
Temporary job end date: _____

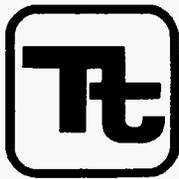
To Be Completed during Report to Workers Compensation Carrier

Date reported: _____ Reported by: _____
Confirmation number: _____
Name of contact: _____
Field office of claims adjuster: _____

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.

ATTACHMENT II

STANDARD OPERATING PROCEDURE FOR UTILITY LOCATING AND EXCAVATION CLEARANCE



TETRA TECH NUS, INC.

STANDARD OPERATING PROCEDURES

Number	HS-1.0	Page	1 of 15
Effective Date	12/03	Revision	2
Applicability	Tetra Tech NUS, Inc.		
Prepared	Health & Safety		
Approved	D. Senovich <i>[Signature]</i>		

Subject
UTILITY LOCATING AND EXCAVATION CLEARANCE

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
1.0 PURPOSE	2
2.0 SCOPE	2
3.0 GLOSSARY	2
4.0 RESPONSIBILITIES	3
5.0 PROCEDURES	3
5.1 BURIED UTILITIES	3
5.2 OVERHEAD POWER LINES	5
6.0 UNDERGROUND LOCATING TECHNIQUES	5
6.1 GEOPHYSICAL METHODS	5
6.2 PASSIVE DETECTION SURVEYS	6
6.3 INTRUSIVE DETECTION SURVEYS	6
7.0 INTRUSIVE ACTIVITIES SUMMARY	7
8.0 REFERENCES	8

ATTACHMENTS

1	Listing of Underground Utility Clearance Resources	9
2	Frost Line Penetration Depths by Geographic Location.....	11
3	Utility Clearance Form.....	12
4	OSHA Letter of Interpretation.....	13

Subject UTILITY LOCATING AND EXCAVATION CLEARANCE	Number HS-1.0	Page 2 of 15
	Revision 2	Effective Date 12/03

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.

Subject UTILITY LOCATING AND EXCAVATION CLEARANCE	Number HS-1.0	Page 3 of 15
	Revision 2	Effective Date 12/03

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 scars and patches, and topographical depressions. Note the location of any emergency shut off switches. Any additional information regarding utility

Subject UTILITY LOCATING AND EXCAVATION CLEARANCE	Number HS-1.0	Page 4 of 15
	Revision 2	Effective Date 12/03

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.

Subject UTILITY LOCATING AND EXCAVATION CLEARANCE	Number HS-1.0	Page 5 of 15
	Revision 2	Effective Date 12/03

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 through conductive materials, tools, or equipment.

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

<u>Nominal Voltage</u>	<u>Minimum Clearance</u>
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.

Subject UTILITY LOCATING AND EXCAVATION CLEARANCE	Number HS-1.0	Page 6 of 15
	Revision 2	Effective Date 12/03

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

Subject UTILITY LOCATING AND EXCAVATION CLEARANCE	Number HS-1.0	Page 7 of 15
	Revision 2	Effective Date 12/03

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.

Subject UTILITY LOCATING AND EXCAVATION CLEARANCE	Number HS-1.0	Page 8 of 15
	Revision 2	Effective Date 12/03

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)
 TtNUS Utility Locating and Clearance Policy
 TtNUS SOP GH-3.1; Resistivity and Electromagnetic Induction
 TtNUS SOP GH-3.2; Magnetic and Metal Detection Surveys
 TtNUS SOP GH-3.4; Ground-penetrating Radar Surveys

Subject UTILITY LOCATING AND EXCAVATION CLEARANCE	Number HS-1.0	Page 9 of 15
	Revision 2	Effective Date 12/03

**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	Iowa Iowa One-Call 1-800-292-8989	New Jersey New Jersey One Call 1-800-272-1000
Alaska Locate Call Center of Alaska, Inc. 1-800-478-3121	Kansas Kansas One-Call System, Inc. 1-800-344-7233	New Mexico New Mexico One Call System, Inc. 1-800-321-2537 Las Cruces- Dona Ana Blue Stakes 1-888-526-0400
Arizona Arizona Blue Stake 1-800-782-5348	Kentucky Kentucky Underground Protection Inc. 1-800-752-6007	New York Dig Safely New York 1-800-862-7962 New York City- Long Island One Call Center 1-800-272-4480
Arkansas Arkansas One Call System, Inc. 1-800-482-8998	Louisiana Louisiana One Call System, Inc. 1-800-272-3020	North Carolina The North Carolina One-Call Center, Inc. 1-800-632-4949
California Underground Service Alert North 1-800-227-2600 Underground Service Alert of Southern California 1-800-227-2600	Maine Dig Safe System, Inc. 1-888-344-7233	North Dakota North Dakota One-Call 1-800-795-0555
Colorado Utility Notification Center of Colorado 1-800-922-1987	Maryland Miss Utility 1-800-257-7777 Miss Utility of Delmarva 1-800-282-8555	Ohio Ohio Utilities Protection Service 1-800-362-2764 Oil & Gas Producers Underground Protect'n Svc 1-800-925-0988
Connecticut Call Before You Dig 1-800-922-4455	Massachusetts Dig Safe System, Inc. 1-888-344-7233	Oklahoma Call Okie 1-800-522-6543
Delaware Miss Utility of Delmarva 1-800-282-8555	Michigan Miss Dig System, Inc. 1-800-482-7171	Oregon Oregon Utility Notification Center/One Call Concepts 1-800-332-2344
Florida Sunshine State One-Call of Florida, Inc. 1-800-432-4770	Minnesota Gopher State One Call 1-800-252-1168	Pennsylvania Pennsylvania One Call System, Inc. 1-800-242-1776
Georgia Underground Protection Center, Inc. 1-800-282-7411	Mississippi Mississippi One-Call System, Inc. 1-800-227-6477	Rhode Island Dig Safe System, Inc. 1-888-344-7233
Hawaii Underground Service Alert North 1-800-227-2600	Missouri Missouri One-Call System, Inc. 1-800-344-7483	South Carolina Palmetto Utility Protection Service Inc. 1-888-721-7877
Idaho Dig Line Inc. 1-800-342-1585 Kootenai County One-Call 1-800-428-4950 Shoshone - Benewah One-Call 1-800-398-3285	Montana Utilities Underground Protection Center 1-800-424-5555 Montana One Call Center 1-800-551-8344	South Dakota South Dakota One Call 1-800-781-7474
Illinois JULIE, Inc. 1-800-892-0123 Digger (Chicago Utility Alert Network) 312-744-7000	Nebraska Diggers Hotline of Nebraska 1-800-331-5666	Tennessee Tennessee One-Call System, Inc. 1-800-351-1111
Indiana Indiana Underground Plant Protection Service 1-800-382-5544	Nevada Underground Service Alert North 1-800-227-2600	
	New Hampshire Dig Safe System, Inc. 1-888-344-7233	

Subject UTILITY LOCATING AND EXCAVATION CLEARANCE	Number HS-1.0	Page 10 of 15
	Revision 2	Effective Date 12/03

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

Subject

UTILITY LOCATING AND
EXCAVATION CLEARANCE

Number

HS-1.0

Revision

2

Page

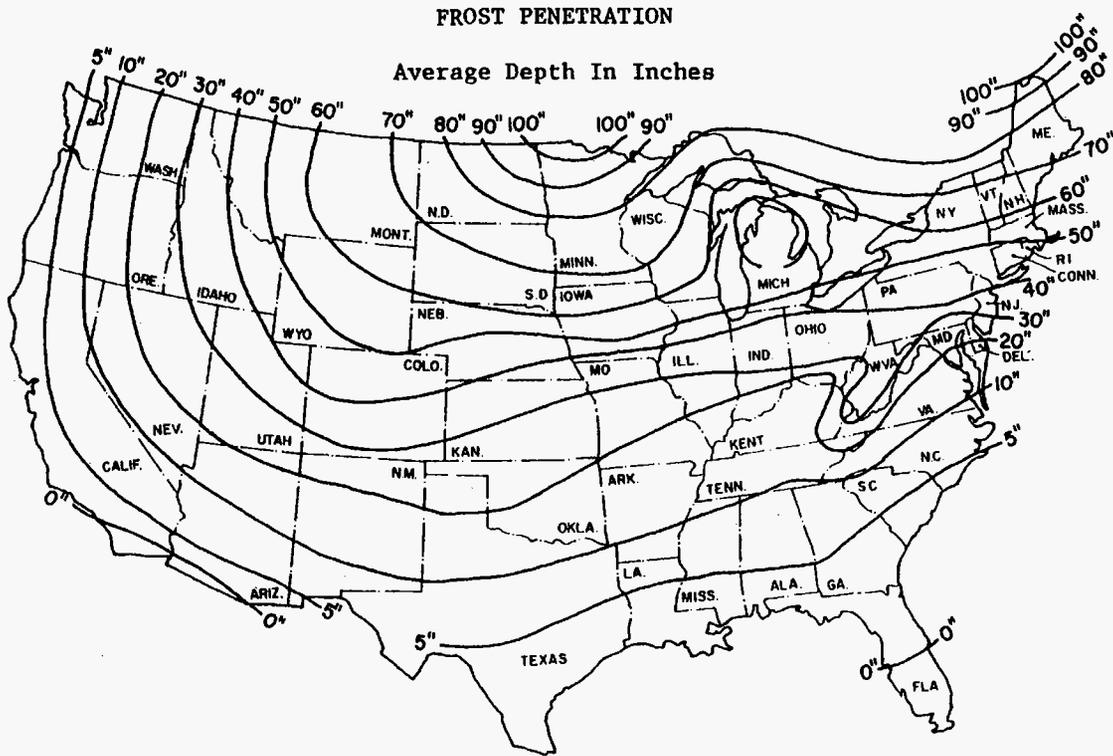
11 of 15

Effective Date

12/03

ATTACHMENT 2

FROST LINE PENETRATION DEPTHS BY GEOGRAPHIC LOCATION



Courtesy U.S. Department Of Commerce

Subject UTILITY LOCATING AND EXCAVATION CLEARANCE	Number HS-1.0	Page 12 of 15
	Revision 2	Effective Date 12/03

**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 yes no N/A
Name _____ Telephone: _____ Date: _____
 - g) State One-Call agency called? yes no N/A
Caller: _____
Ticket Number: _____ Date: _____
 - h) Geophysical survey performed? yes no N/A
Survey performed by: _____
Method: _____ Date: _____
 - i) Hand excavation performed (with concurrent use of utility
detection device)? yes no N/A
Completed by: _____
Total depth: _____ feet Date: _____
 - j) Trench/excavation probed? yes no N/A
Probing completed by: _____
Depth/frequency: _____ Date: _____

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

Subject UTILITY LOCATING AND EXCAVATION CLEARANCE	Number HS-1.0	Page 13 of 15
	Revision 2	Effective Date 12/03

**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:

Subject UTILITY LOCATING AND EXCAVATION CLEARANCE	Number HS-1.0	Page 14 of 15
	Revision 2	Effective Date 12/03

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.

Subject UTILITY LOCATING AND EXCAVATION CLEARANCE	Number HS-1.0	Page 15 of 15
	Revision 2	Effective Date 12/03

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 III

EQUIPMENT INSPECTION CHECKLIST

EQUIPMENT INSPECTION

COMPANY: _____ **UNIT NO.** _____

FREQUENCY: Inspect daily, document prior to use and as repairs are needed.

Inspection Date: ____/____/____ Time: _____ Equipment Type: _____
(e.g., bulldozer)

	Good	Need Repair	N/A
Tires or tracks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hoses and belts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cab, mirrors, safety glass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Turn signals, lights, brake lights, etc. (front/rear) for equipment approved for highway use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Is the equipment equipped with audible back-up alarms and back-up lights?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Horn and gauges	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brake condition (dynamic, park, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire extinguisher (Type/Rating - _____)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fluid Levels:			
- Engine oil	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Transmission fluid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Brake fluid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Cooling system fluid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Windshield wipers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Hydraulic oil	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Oil leak/lube	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coupling devices and connectors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exhaust system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Blade/boom/ripper condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Accessways: Frame, hand holds, ladders, walkways (non-slip surfaces), guardrails?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Power cable and/or hoist cable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Steering (standard and emergency)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Safety Guards:

	Yes	No
- Around rotating apparatus (belts, pulleys, sprockets, spindles, drums, flywheels, chains) all points of operations protected from accidental contact? _____	<input type="checkbox"/>	<input type="checkbox"/>

- Hot pipes and surfaces exposed to accidental contact? _____	<input type="checkbox"/>	<input type="checkbox"/>

- All emergency shut offs have been identified and communicated to the field crew? _____	<input type="checkbox"/>	<input type="checkbox"/>

- Have emergency shutoffs been field tested? _____	<input type="checkbox"/>	<input type="checkbox"/>

- Results? _____	<input type="checkbox"/>	<input type="checkbox"/>

- Are any structural members bent, rusted, or otherwise show signs of damage? _____	<input type="checkbox"/>	<input type="checkbox"/>

- Are fueling cans used with this equipment approved type safety cans? _____	<input type="checkbox"/>	<input type="checkbox"/>

- Have the attachments designed for use (as per manufacturer's recommendation) with this equipment been inspected and are considered suitable for use? _____	<input type="checkbox"/>	<input type="checkbox"/>

Portable Power Tools:

- Tools and Equipment in Safe Condition? _____	<input type="checkbox"/>	<input type="checkbox"/>

- Saw blades, grinding wheels free from recognizable defects (grinding wheels have been sounded)? _____
- Portable electric tools properly grounded? _____
- Damage to electrical power cords? _____
- Blade guards in place? _____
- Components adjusted as per manufacturers recommendation? _____

Cleanliness:

- Overall condition (is the decontamination performed prior to arrival on-site considered acceptable)? _____
- Where was this equipment used prior to its arrival on site? _____
- Site Contaminants of concern at the previous site? _____
- Inside debris (coffee cups, soda cans, tools and equipment) blocking free access to foot controls? _____

Operator Qualifications (as applicable for all heavy equipment):

- Does the operator have proper licensing where applicable, (e.g., CDL)? _____
- Does the operator, understand the equipments operating instructions? _____
- Is the operator experienced with this equipment? _____
- Does the operator have emotional and/or physical limitations which would prevent him/her from performing this task in a safe manner? _____
- Is the operator 21 years of age or more? _____

Identification:

- Is a tagging system available, for positive identification, for tools removed from service? _____

Additional Inspection Required Prior to Use On-Site

- | | Yes | No |
|---|--------------------------|--------------------------|
| - Does equipment emit noise levels above 90 decibels? | <input type="checkbox"/> | <input type="checkbox"/> |
| - If so, has an 8-hour noise dosimetry test been performed? | <input type="checkbox"/> | <input type="checkbox"/> |
| - Results of noise dosimetry: _____ | | |
| - Defects and repairs needed: _____ | | |
| - General Safety Condition: _____ | | |
| - Operator or mechanic signature: _____ | | |

Approved for Use: Yes No _____

Site Safety Officer Signature

ATTACHMENT IV

SAFE WORK PERMITS

SAFE WORK PERMIT
MOBILIZATION AND DEMOBILIZATION
NAVAL AIR STATION PENSACOLA,
PENSACOLA, FLORIDA

Permit No. _____ Date: _____ Time: From _____ to _____

- I. Work limited to the following (description, area, equipment used):** Mob/Demob
- II. Primary Hazards:** Potential hazards associated with this task: lifting; pinches and compressions; slip, trip and falls; vehicular and foot traffic; ambient temperature extremes; insect and animal bites, and inclement weather
- III. Field Crew:** _____
- IV. On-site Inspection conducted** Yes No Initials of Inspector TtNUS
Equipment Inspection required Yes No Initials of Inspector TtNUS

- V. Protective equipment required** Level D Level B Level C Level A
- Respiratory equipment required** Yes Specify on the reverse
 No
- Modifications/Exceptions: _____

VI. Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures
None expected during this task	_____	_____	_____
_____	_____	_____	_____

Primary Route(s) of Exposure/Hazard: NA

(Note to FOL and/or SSO: Each item in Sections VII, VIII, and IX must be checked Yes, No, or NA)

- VII. Additional Safety Equipment/Procedures**
- | | | | |
|-----------------------------------|---|---------------------------------------|---|
| Hard-hat..... | <input type="checkbox"/> Yes <input type="checkbox"/> No | Hearing Protection (Plugs/Muffs)..... | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Safety Glasses..... | <input type="checkbox"/> Yes <input type="checkbox"/> No | Safety belt/harness..... | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Chemical/splash goggles..... | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Radio/Cellular Phone..... | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Splash shield..... | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Barricades..... | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Splash suits/coveralls..... | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Gloves (Type – Work)..... | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Impermeable apron..... | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Work/rest regimen..... | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Steel toe work shoes or boots.... | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Chemical resistant boot covers..... | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| High visibility vest..... | <input type="checkbox"/> Yes <input type="checkbox"/> No | Tape up/use insect repellent..... | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| First Aid Kit..... | <input type="checkbox"/> Yes <input type="checkbox"/> No | Fire extinguisher..... | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Safety Shower/Eyewash..... | <input type="checkbox"/> Yes <input type="checkbox"/> No | Other..... | <input type="checkbox"/> Yes <input type="checkbox"/> No |
- Modifications/Exceptions: _____

- VIII. Site Preparation**
- | | Yes | No | NA |
|--|--------------------------|--------------------------|--------------------------|
| Utility Locating and Excavation Clearance completed..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Vehicle and Foot Traffic Routes Established/Traffic Control Barricades/Signs in Place..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Physical Hazards Identified and Isolated (Splash and containment barriers)..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Emergency Equipment Staged (Spill control, fire extinguishers, first aid kits, etc.)..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- IX. Additional Permits required** (Hot work, confined space entry, excavation etc.)..... Yes No
If yes, SSO to complete or contact Health Sciences, Pittsburgh Office (412)921-7090

- X. Special instructions, precautions:** Use safe lifting/carrying techniques. Use additional PPE based on the hazards that are associated with each task. Use work gloves when cutting boxes or handling sharp tools/cutting devices. Safety glasses will be required whenever eye hazards are present. Reflective vests will be used when working near roadways or areas of operating vehicles/equipment. Identify/remove potential physical hazards and mark areas or hazards that cannot be removed. Keep work area free of ground clutter.

Permit Issued by: _____ Permit Accepted by: _____

SAFE WORK PERMIT
SOIL BORING AND MONITORING WELL INSTALLATION
NAVAL AIR STATION PENSACOLA,
PENSACOLA, FLORIDA

Permit No. _____ Date: _____ Time: From _____ to _____

I. Work limited to the following (description, area, equipment used): Soil Boring and Monitoring Well installation

II. Primary Hazards: Potential hazards associated with this task: chemical exposure; transfer of contamination; heavy equipment hazards; noise; energized systems; lifting; slip, trip and fall; cuts and lacerations; vehicular and foot traffic; ambient temperature extremes; flying projectiles; insect/animal bites and stings, poisonous plants, inclement weather

III. Field Crew: _____

IV. On-site Inspection conducted Yes No Initials of Inspector _____ TtNUS
Equipment Inspection required Yes No Initials of Inspector _____ TtNUS

V. Protective equipment required

Level D Level B
 Level C Level A

Respiratory equipment required

Yes Specify on the reverse
 No

Modifications/Exceptions: _____

VI. Chemicals of Concern
VOCs (TCE, and PCE)

Hazard Monitoring
FID

Action Level(s)
sustained readings(> 1 minute)
above 25 ppm

Response Measures
evacuate area until
readings return to
background
Avoid dust and use
suppression methods

Primary Route(s) of Exposure/Hazard: inhalation

(Note to FOL and/or SSO: Each item in Sections VII, VIII, and IX must be checked Yes, No, or NA)

VII. Additional Safety Equipment/Procedures

Hard-hat Yes No
 Safety Glasses Yes No
 Chemical/splash goggles Yes No
 Splash shield Yes No
 Splash suits/coveralls Yes No
 Impermeable apron Yes No
 Steel toe work shoes or boots Yes No
 High visibility vest Yes No
 First Aid Kit Yes No
 Safety Shower/Eyewash Yes No

Hearing Protection (Plugs/Muffs) Yes No
 Safety belt/harness Yes No
 Radio/Cellular Phone Yes No
 Barricades Yes No
 Gloves (Type – nitrile/work) Yes No
 Work/rest regimen Yes No
 Chemical resistant boot covers Yes No
 Tape up/use insect repellent Yes No
 Fire extinguisher Yes No
 Other Yes No

Modifications/Exceptions: _____

VIII. Site Preparation

	Yes	No	NA
Utility Locating and Excavation Clearance completed.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vehicle and Foot Traffic Routes Established/Traffic Control Barricades/Signs in Place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Physical Hazards Identified and Isolated (Splash and containment barriers).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emergency Equipment Staged (Spill control, fire extinguishers, first aid kits, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IX. Additional Permits required (Hot work, confined space entry, excavation etc.) Yes No
If yes, SSO to complete or contact Health Sciences, Pittsburgh Office (412)921-7090

X. Special instructions, precautions: Use safe lifting/carrying techniques. Inspect equipment prior to use. Ensure emergency stop devices are functional and test daily.

SAFE WORK PERMIT
SOIL BORING AND MONITORING WELL INSTALLATION
NAVAL AIR STATION PENSACOLA,
PENSACOLA, FLORIDA

Permit Issued by: _____ Permit Accepted by: _____

SAFE WORK PERMIT
MULTI MEDIA SAMPLING AND WELL DEVELOPMENT
NAVAL AIR STATION PENSACOLA,
PENSACOLA, FLORIDA

Permit No. _____ Date: _____ Time: From _____ to _____

- I. **Work limited to the following (description, area, equipment used):** Multimedia sampling including soils, groundwater and IDW
- II. **Primary Hazards:** Potential hazards associated with this task: chemical; transfer of contamination; slips, trips and falls; lifting; cuts and lacerations; contact with utilities; ambient temperature extremes, insect/animal bites, stings, and inclement weather
- III. **Field Crew:** _____
- IV. **On-site Inspection conducted** Yes No Initials of Inspector TtNUS
Equipment Inspection required Yes No Initials of Inspector TtNUS

- V. **Protective equipment required**
 Level D Level B
 Level C Level A
 Modifications/Exceptions: _____
- Respiratory equipment required**
 Yes Specify on the reverse
 No

VI. Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures
<u>VOCs (TCE, and PCE)</u>	<u>FID</u>	<u>Sustained readings(> 1 minute) above 25 ppm</u>	<u>evacuate area until readings return to background</u>
_____	_____	_____	_____

Primary Route(s) of Exposure/Hazard: absorption

(Note to FOL and/or SSO: Each item in Sections VII, VIII, and IX must be checked Yes, No, or NA)

VII. Additional Safety Equipment/Procedures

- | | | | |
|------------------------------------|---|--|---|
| Hard-hat..... | <input type="checkbox"/> Yes <input type="checkbox"/> No | Hearing Protection (Plugs/Muffs) | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Safety Glasses | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Safety Belt/Harness | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Chemical/Splash Goggles | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Radio/Cellular Phone | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Splash Shield | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Barricades..... | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Splash Suits/Coveralls | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Gloves (Type – Nitrile) | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| Impermeable Apron..... | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Work/rest regimen..... | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Steel Toe Work Shoes or Boots..... | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Chemical Resistant Boot Covers | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| High Visibility Vest..... | <input type="checkbox"/> Yes <input type="checkbox"/> No | Tape/Insect Repellent | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| First Aid Kit..... | <input type="checkbox"/> Yes <input type="checkbox"/> No | Fire Extinguisher | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Safety Shower/Eyewash | <input type="checkbox"/> Yes <input type="checkbox"/> No | Other..... | <input type="checkbox"/> Yes <input type="checkbox"/> No |
- Modifications/Exceptions: _____

VIII. Site Preparation

- | | Yes | No | NA |
|---|--------------------------|--------------------------|--------------------------|
| Utility Locating and Excavation Clearance completed..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Vehicle and Foot Traffic Routes Established/Traffic Control Barricades/Signs in Place | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Physical Hazards Identified and Isolated (Splash and containment barriers)..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Emergency Equipment Staged (Spill control, fire extinguishers, first aid kits, etc). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- IX. **Additional Permits required** (Hot work, confined space entry, excavation etc.)..... Yes No
If yes, SSO to complete or contact Health Sciences, Pittsburgh Office (412)921-7090

- X. **Special instructions, precautions:** Use safe lifting/carrying techniques. Assume all media is contaminated and avoid contact through the use of safe work practices, PPE and decontamination.

Permit Issued by: _____ Permit Accepted by: _____

**SAFE WORK PERMIT
 DECONTAMINATION
 NAVAL AIR STATION PENSACOLA,
 PENSACOLA, FLORIDA**

Permit No. _____ Date: _____ Time: From _____ to _____

- I. **Work limited to the following (description, area, equipment used):** Decontamination of the sampling and heavy equipment
- II. **Primary Hazards:** Potential hazards associated with this task: chemical exposure; lifting; noise; flying projectiles; vehicle and foot traffic; ambient temperature extremes; slip, trip and fall; and inclement weather
- III. **Field Crew:** _____
- IV. **On-site Inspection conducted** Yes No Initials of Inspector _____ TtNUS
Equipment Inspection required Yes No Initials of Inspector _____ TtNUS

- V. **Protective equipment required** Level D Level B
 Level C Level A
 Modifications/Exceptions: _____
- Respiratory equipment required**
 Yes Specify on the reverse
 No

VI. Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures
VOCs (TCE, and PCE)	FID	Sustained readings(> 1 minute) above 25 ppm	evacuate area until readings return to background
_____	_____	_____	_____
_____	_____	_____	_____

Primary Route(s) of Exposure/Hazard: absorption

(Note to FOL and/or SSO: Each item in Sections VII, VIII, and IX must be checked Yes, No, or NA)

- VII. **Additional Safety Equipment/Procedures**
- | | | | |
|-------------------------------------|---|--|---|
| Hard-Hat | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Hearing Protection (Plugs/Muffs) | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| Safety Glasses | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Safety Belt/Harness | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Chemical/Splash Goggles | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Radio/Cellular Phone | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Splash Shield | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Barricades | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Splash Suits/Coveralls | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Gloves (Type – Nitrile) | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| Impermeable apron | <input type="checkbox"/> Yes <input type="checkbox"/> No | Work/rest Regimen | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Steel Toe Work Shoes or Boots | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Chemical Resistant Boot Covers | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| High Visibility Vest | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Tape/Insect Repellent | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| First Aid Kit | <input type="checkbox"/> Yes <input type="checkbox"/> No | Fire Extinguisher | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Safety Shower/Eyewash | <input type="checkbox"/> Yes <input type="checkbox"/> No | Other | <input type="checkbox"/> Yes <input type="checkbox"/> No |
- Modifications/Exceptions: _____

- VIII. **Site Preparation**
- | | Yes | No | NA |
|---|--------------------------|--------------------------|--------------------------|
| Utility Locating and Excavation Clearance completed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Vehicle and Foot Traffic Routes Established/Traffic Control Barricades/Signs in Place | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Physical Hazards Identified and Isolated (Splash and containment barriers) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Emergency Equipment Staged (Spill control, fire extinguishers, first aid kits, etc.) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- IX. **Additional Permits required** (Hot work, confined space entry, excavation etc.) Yes No
 If yes, SSO to complete or contact Health Sciences, Pittsburgh Office (412)921-7090

- X. **Special instructions, precautions:** Review and follow the instructions on the MSDS for the decontamination fluids. Follow guidance in Table 5-1 for PPE for different decontamination tasks.

Permit Issued by: _____ Permit Accepted by: _____

SAFE WORK PERMIT
GEOGRAPHIC LAND SURVEYING
NAVAL AIR STATION PENSACOLA
PENSACOLA, FLORIDA

Permit No. _____ Date: _____ Time: From _____ to _____

I. Work limited to the following (description, area, equipment used): Geographic Land Survey

II. Primary Hazards: Potential hazards associated with this task: slip, trip and fall; cuts and abrasions; traffic hazards inclement weather; insect /animal bites or stings, poisonous plants, etc.

III. Field Crew: _____

IV. On-site Inspection conducted Yes No Initials of Inspector _____ TtNUS
Equipment Inspection required Yes No Initials of Inspector _____ TtNUS

V. Protective equipment required

Level D Level B
 Level C Level A

Modifications/Exceptions: _____

Respiratory equipment required

Yes Specify on the reverse
 No

VI. Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures
None expected during this task	_____	_____	_____
_____	_____	_____	_____

Primary Route(s) of Exposure/Hazard: _____

(Note to FOL and/or SSO: Each item in Sections VII, VIII, and IX must be checked Yes, No, or NA)

VII. Additional Safety Equipment/Procedures

Hard-hat.....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Hearing Protection (Plugs/Muffs).....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Safety Glasses	<input type="checkbox"/> Yes <input type="checkbox"/> No	Safety belt/harness	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Chemical/splash goggles	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Radio/Cellular Phone	<input type="checkbox"/> Yes <input type="checkbox"/> No
Splash Shield	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Barricades.....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Splash suits/coveralls.....	<input type="checkbox"/> Yes <input type="checkbox"/> No	Gloves (Type – Work)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Impermeable apron.....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Work/rest regimen.....	<input type="checkbox"/> Yes <input type="checkbox"/> No
Steel toe work shoes or boots	<input type="checkbox"/> Yes <input type="checkbox"/> No	Chemical Resistant Boot Covers	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
High Visibility vest	<input type="checkbox"/> Yes <input type="checkbox"/> No	Tape up/use insect repellent	<input type="checkbox"/> Yes <input type="checkbox"/> No
First Aid Kit.....	<input type="checkbox"/> Yes <input type="checkbox"/> No	Fire Extinguisher	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Safety Shower/Eyewash	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Other.....	<input type="checkbox"/> Yes <input type="checkbox"/> No

Modifications/Exceptions: Snake chaps in high brush areas

VIII. Site Preparation

	Yes	No	NA
Utility Locating and Excavation Clearance completed.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vehicle and Foot Traffic Routes Established/Traffic Control Barricades/Signs in Place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Physical Hazards Identified and Isolated (Splash and containment barriers).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emergency Equipment Staged (Spill control, fire extinguishers, first aid kits, etc).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IX. Additional Permits required (Hot work, confined space entry, excavation etc.)..... Yes No
If yes, SSO to complete or contact Health Sciences, Pittsburgh Office (412)921-7090

X. Special instructions, precautions: _____

Permit Issued by: _____ Permit Accepted by: _____

SAFE WORK PERMIT
IDW MANAGEMENT
NAVAL AIR STATION PENSACOLA
PENSACOLA, FLORIDA

Permit No. _____ Date: _____ Time: From _____ to _____

I. Work limited to the following (description, area, equipment used): IDW management, moving and storage

II. Primary Hazards: Potential hazards associated with this task: spill; strains and sprains; back injuries compressions

III. Field Crew: _____

IV. On-site Inspection conducted Yes No Initials of Inspector TtNUS
Equipment Inspection required Yes No Initials of Inspector TtNUS

V. Protective equipment required

Level D Level B
 Level C Level A

Respiratory equipment required

Yes Specify on the reverse
 No

Modifications/Exceptions: _____

VI. Chemicals of Concern

None expected during this task

Hazard Monitoring

Action Level(s)

Response Measures

Primary Route(s) of Exposure/Hazard: absorption

(Note to FOL and/or SSO: Each item in Sections VII, VIII, and IX must be checked Yes, No, or NA)

VII. Additional Safety Equipment/Procedures

Hard-hat	<input type="checkbox"/> Yes <input type="checkbox"/> No	Hearing Protection (Plugs/Muffs)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Safety Glasses	<input type="checkbox"/> Yes <input type="checkbox"/> No	Safety belt/harness	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Chemical/splash goggles	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Radio/Cellular Phone	<input type="checkbox"/> Yes <input type="checkbox"/> No
Splash Shield	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Barricades.....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Splash suits/coveralls.....	<input type="checkbox"/> Yes <input type="checkbox"/> No	Gloves (Type – work).....	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Impermeable apron.....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Work/rest regimen.....	<input type="checkbox"/> Yes <input type="checkbox"/> No
Steel toe work shoes or boots.....	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Chemical Resistant Boot Covers	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
High Visibility vest.....	<input type="checkbox"/> Yes <input type="checkbox"/> No	Tape up/use insect repellent	<input type="checkbox"/> Yes <input type="checkbox"/> No
First Aid Kit.....	<input type="checkbox"/> Yes <input type="checkbox"/> No	Fire Extinguisher	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Safety Shower/Eyewash	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Other.....	<input type="checkbox"/> Yes <input type="checkbox"/> No

Modifications/Exceptions: _____

VIII. Site Preparation

	Yes	No	NA
Utility Locating and Excavation Clearance completed.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vehicle and Foot Traffic Routes Established/Traffic Control Barricades/Signs in Place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Physical Hazards Identified and Isolated (Splash and containment barriers).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emergency Equipment Staged (Spill control, fire extinguishers, first aid kits, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IX. Additional Permits required (Hot work, confined space entry, excavation etc.) Yes No
If yes, SSO to complete or contact Health Sciences, Pittsburgh Office (412)921-7090

X. Special instructions, precautions: Inspect roll off boxes and drums used to store IDW prior to use. Cover IDW containers and roll off boxes to prevent unauthorized entry and filling with rain water. Do not over load. Disperse IDW evenly. Use proper lifting practices and obtain assistance when handling heavy drums.

Permit Issued by: _____ Permit Accepted by: _____

ATTACHMENT V

MEDICAL DATA SHEET

MEDICAL DATA SHEET

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

Project **NAS – Pensacola** _____

Name _____ Home Telephone _____

Address _____

Age _____ Height _____ Weight _____

Name of Next Kin _____

Drug or other Allergies _____

Particular Sensitivities _____

Do You Wear Contacts? _____

Provide a Checklist of Previous Illnesses or Exposure to Hazardous Chemicals _____

What medications are you presently using? _____

Do you have any medical restrictions? _____

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

I am the individual described above. I have read and understand this HASP.

Signature

Date