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WORK PLAN ADDENDUM NO 08 FREE PRODUCT REMOVAL AT UNDERGROUND
STORAGE TANK 2406 NAS SAUFLEY FIELD FL
2/25/2008
CH2M HILL

**Work Plan Addendum No. 08
Free Product Removal at UST 2406
Outlying Landing Field Saufley
Naval Air Station Pensacola
Pensacola, Florida**

Revision No. 00

**Contract No. N62467-01-D-0331
Contract Task Order No. 0019**

Submitted to:



**U.S. Naval Facilities
Engineering Command
Southeast**

Prepared by:



1000 Abernathy Road
Suite 1600
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February 2008

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Date

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Acronym List

AALA	American Association for Laboratory Accreditation
AASHTO	American Association of State Highway and Transportation Officials
AFCEE	Air Force Center for Engineering and the Environment
AFVR	aggressive fluid vapor recovery
BTEX	benzene, toluene, ethylbenzene, and total xylenes
°C	Degrees Celsius
CFR	Code of Federal Regulations
CH2M HILL	CH2M HILL Constructors, Inc.
CIH	Certified Industrial Hygienist
CO	Contracting Officer
COC	chemical of concern
CTO	Contract Task Order
DFOW	definable feature of work
DI	de-ionized
DO	dissolved oxygen
DOT	Department of transportation
DPE	dual phase extraction
DQO	data quality objective
EISOPQAM	Environmental Investigative Standard Operating Procedures and Quality Assurance Manual
EPA	Environmental Protection Agency
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FID	flame ionization detector
FL-PRO	Florida Petroleum Range Organic
GAC	granular activated carbon
gpm	gallons per minute
Hg	mercury
ID	identification
IDW	investigative derived waste
IRCDQM	Installation Restoration Chemical Data Quality Manual
LDR	Land Disposal Restriction
MS/MSD	matrix spike/matrix spike duplicate
MSDS	Material Safety Data Sheet
MSR	Monthly Status Report
MTBE	methyl tert-butyl ether
µg/L	micrograms per liter
MW	monitoring well
NAS	Naval Air Station
NAVFAC SE	Naval Facilities Engineering Command, Southeast
NIST	National Institute of Standards and Technology
NRC	National Response Center
NTR	Navy Technical Representative

NVLAP	National Voluntary Laboratory Accreditation Program
OLF	Outlying Landing Field
ORP	oxidation-reduction potential
OSHA	Occupational Safety and Health Administration
OVA	organic vapor analyzer
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyl
PPE	personal protective equipment
ppm	parts per million
PVC	polyvinyl chloride
QA	quality assurance
QC	quality control
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
ROI	radius of influence
ROICC	Resident Officer In Charge of Construction
RPM	Restoration Project Manager
SAP	Sampling and Analysis Plan
scfm	standard cubic feet per minute
SOP	Standard Operating Procedure
SS	stainless steel
SVOC	semi-volatile organic compounds
SW	solid waste
T&D	transportation and disposal
TAT	turnaround time
TCL	target compound list
TM	technical memorandum
TPH	total petroleum hydrocarbon
TRPH	total recoverable petroleum hydrocarbon
TtNUS	TetraTech NUS, Inc.
USACE	U.S. Army Corps of Engineers
UST	underground storage tank
VOC	volatile organic compounds

1.0 Introduction

The Department of the Navy, Naval Facilities Engineering Command Southeast (NAVFAC SE) has contracted CH2M HILL Constructors, Inc. (CH2M HILL) to conduct product removal activities and groundwater monitoring at Underground Storage Tank (UST) Site 2406, located at Outlying Landing Field (OLF) Saufley, Naval Air Station (NAS) Pensacola in Pensacola, Florida. Figures 1-1 and 1-2 show the location of the remedial site at OLF Saufley. This Work Plan Addendum was prepared under Response Action Contract No. N62467-01-D-0331, Contract Task Order (CTO) No. 0019. The work activities are part of the remedial action at OLF Saufley required under the Florida Department of Environmental Protection (FDEP) Petroleum Cleanup Program, Florida Administrative Code (FAC) 62-770.

A Remedial Action Plan (RAP) dated August 2006 and prepared by TetraTech NUS, Inc. (TtNUS) addressed product removal and groundwater monitoring at OLF Saufley.

1.1 Overview

The scope of work that will be performed at Site 2406 will include planning and implementation of dual phase extraction (DPE) of light non-aqueous phase liquid (free product) using aggressive fluid vapor recovery (AFVR). This technology will operate for 7 months to remove free product at the site. In addition, three quarterly groundwater sampling events will be performed to evaluate system performance. All work activities will be performed in accordance with the FDEP-approved RAP, dated August 2006, and this Work Plan Addendum.

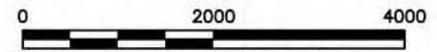
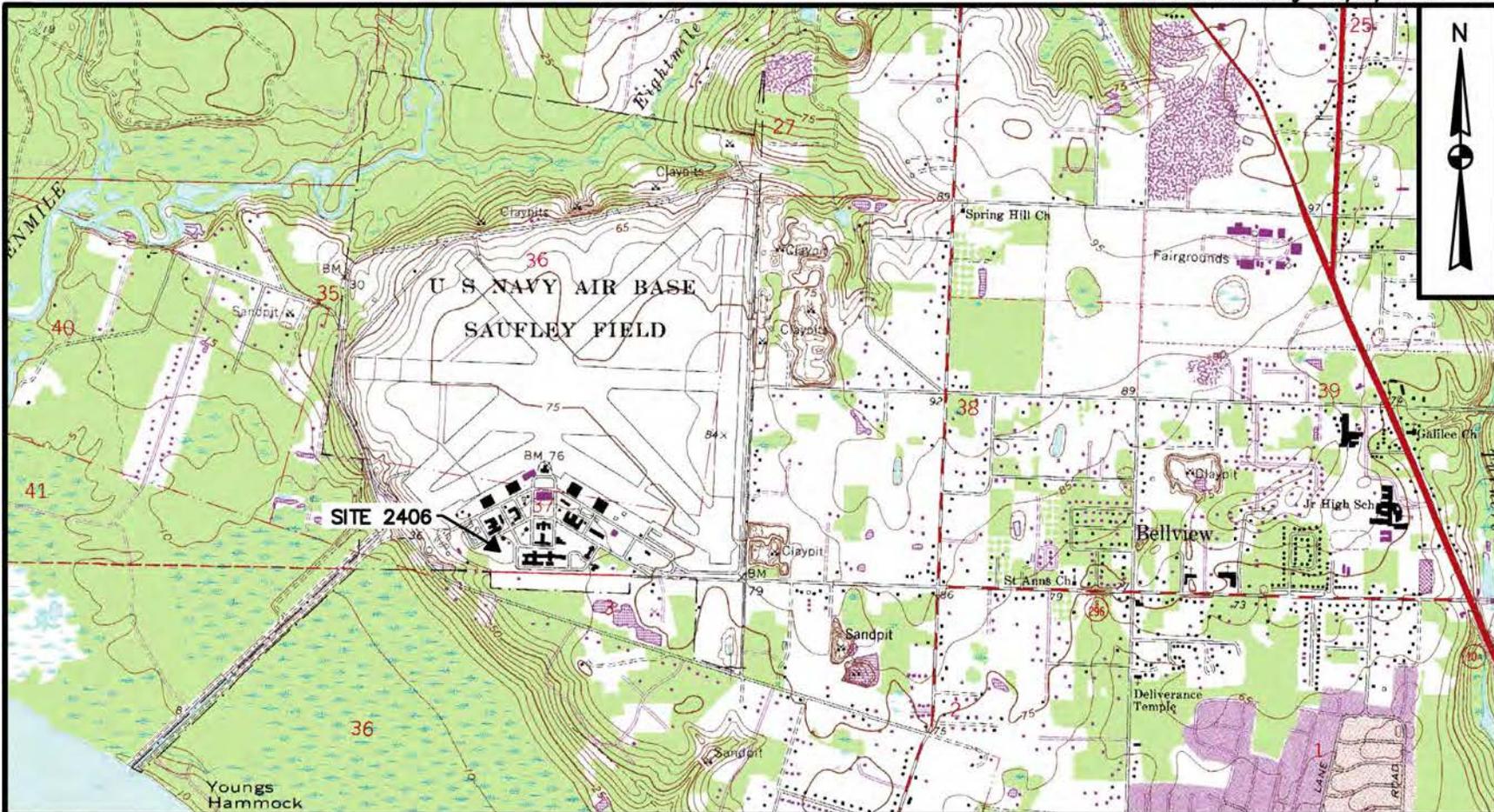
1.2 Petroleum Product Recovery Program Objectives

The primary objectives of this Product Recovery Program are to satisfy the requirements set forth in the site-specific RAP as they relate to free product recovery at OLF Saufley. The RAP requires removal of free product from groundwater to the fullest extent practicable, as well as free product monitoring to establish satisfactory removal of free product or the need for additional remedial action.

1.3 Petroleum Product Recovery Program Requirements for UST 2406

The RAP includes a decision-making process for using an AFVR technique for free product recovery. Work performed under this Work Plan Addendum will follow a modified, active free product removal process, as described below:

- AFVR events will be conducted at select monitoring wells with a free product thickness greater than 0.01 feet.



SOURCE: U.S.G.S. TOPOGRAPHIC QUADRANGLE WEST PENSACOLA, FLORIDA (1970 EDITION-PHOTOREVISED 1987).



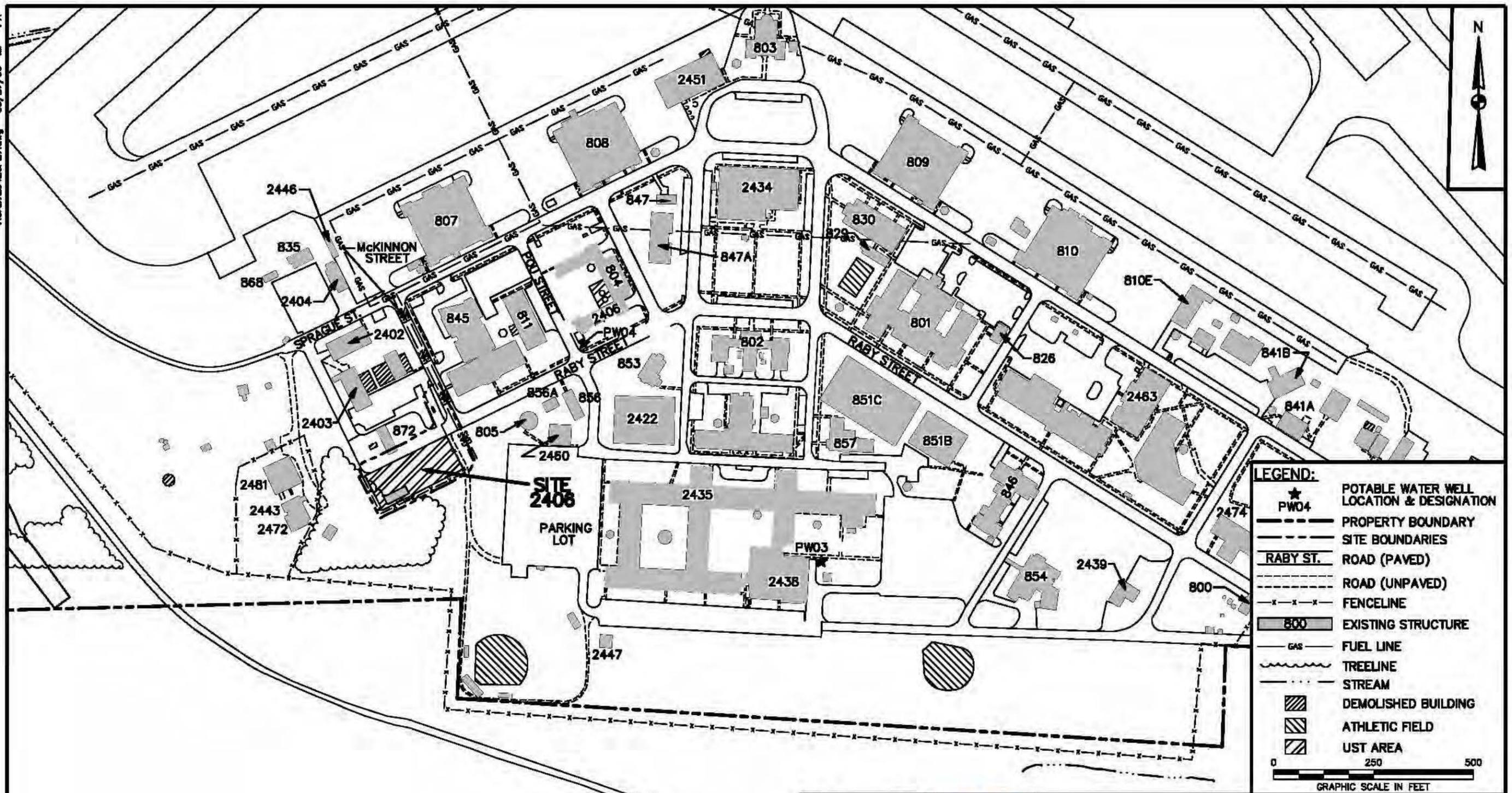
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**SITE VICINITY MAP
REMEDIAL ACTION PLAN
OLF SAUFLEY, SITE 2406
NAS PENSACOLA
PENSACOLA, FLORIDA**

CONTRACT NO. 2642	
OWNER NO. 0000	
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LEGEND:

- ★ PWO4 POTABLE WATER WELL LOCATION & DESIGNATION
- PROPERTY BOUNDARY
- - - SITE BOUNDARIES
- RABY ST. ROAD (PAVED)
- - - ROAD (UNPAVED)
- x x x FENCELINE
- 800 EXISTING STRUCTURE
- GAS FUEL LINE
- ~~~~~ TREELINE
- - - - - STREAM
- ▨ DEMOLISHED BUILDING
- ▧ ATHLETIC FIELD
- ▩ UST AREA

0 250 500
GRAPHIC SCALE IN FEET

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**BASE MAP
REMEDIAL ACTION PLAN
OLF SAUFLEY, SITE 2406
NAS PENSACOLA
PENSACOLA, FLORIDA**

CONTRACT NO. 2842	
OWNER NO. 0000	
APPROVED BY	DATE
DRAWING NO. FIGURE 1-2	REV. 0

- Data including free product thickness, vapor flow rates, and vacuum readings will be gathered from monitoring wells before, during, and after each AFVR event.
- This remedial method will continue based on recovery and effectiveness. Recovery attempts will continue if the free product removal is determined to be effective. The frequency for remedial activities will be determined by free product monitoring performed on a biweekly basis (i.e., every 2 weeks) after the AFVR events. If free product is present in wells at the site, another DPE event will be scheduled. If free product is not present in any well after the 2-week measurement, monitoring will continue every 2 weeks until 3 months have past. If free product is not present (less than 0.01 feet) after one full quarter following a DPE event, additional sampling will be done to re-evaluate the soil and groundwater conditions.

As outlined in the RAP (TtNUS, 2006), the specific program requirements for remediation include removal of free product from groundwater to the fullest extent practicable at OLF Saufley. If no free product is measured in the wells during six consecutive biweekly monitoring events, subsequent remedial investigations will be conducted to determine the final remedial action for the site.

1.4 Scope of Work

The proposed scope of work for OLF Saufley includes the following activities:

- **Active Product Recovery.** An active AFVR method will be implemented as part of the remedial program. This method will be used to expedite the recovery of free product by simultaneously using vacuum-enhanced extraction/recovery to remove free product from the water table and capillary fringe, vapor extraction to remove high volatility vapors from the vadose zone, and to stimulate biodegradation of less volatile hydrocarbons in unsaturated and capillary zones. The AFVR method will be performed on up to four existing monitoring wells that contain greater than 0.01 feet of free product.
- **Quarterly Groundwater Monitoring.** Three quarterly groundwater monitoring events will be conducted after the first AFVR event. Five monitoring wells will be sampled for benzene, toluene, ethylbenzene, and total xylenes (BTEX) using U.S. Environmental Protection Agency (EPA) Solid Waste (SW) 846 Method 8260B, polycyclic aromatic hydrocarbons (PAHs) using EPA SW846 Method 8310 and total recoverable petroleum hydrocarbon (TRPH) using the Florida Petroleum Range Organics (FL-PRO) method.
- **Status Reports.** The status of the remedial activities will be reported following each event in the form of a technical memorandum (TM). The TM will include a summary of the activities along with summary tables of measurements conducted during the event.
- **Monitoring Free Product Levels in Wells.** Before, during, and after each AFVR event, free product and water levels will be recorded in the monitoring wells used for DPE using an electronic interface probe. Free product and water levels will also be monitored 2 weeks after each AFVR event to check for the reappearance of free product. Remedial

activities will continue in each well until no measurable free product (less than 0.01 feet) is recorded.

- **Waste Management.** Waste generated in the course of remedial activities will be managed in accordance with the Waste Management Plan provided in Section 6.

1.5 Project Schedule

The proposed project schedule is provided in Appendix A. Scheduled activities include site monitoring, free product removal, and reporting.

The proposed schedule is based on estimates of remediation progress at OLF Saufley. As previously discussed, the timing of some remediation activities will be determined by actual field conditions.

1.6 Project Deliverables

Major project deliverables include the monthly status reports (MSRs), initial AFVR/DPE event technical memorandum, monthly AFVR/DPE event reports, quarterly groundwater sampling event reports, and the Project Completion Report.

1.6.1 Monthly Status Reports

MSRs will be prepared to inform the RPM of the status, progress and upcoming events of the project. A copy of the MSR will be submitted to the RPM no later than the 20th of the following month.

1.6.2 Initial AFVR /DPE Technical Memorandum

A TM detailing the results of the initial AFVR/DPE event and outlining the proposed path forward will be forwarded to the Navy for review. Upon Navy approval, and if appropriate, the TM will be forwarded to FDEP for review.

1.6.3 Monthly AFVR/DPE Event Report

After each AFVR/DPE event, a monthly report will be prepared. These reports will include a description of all work performed during the event as well as the estimated volume of free product removed, hydrocarbon constituent concentrations in recovered vapors, the cumulative mass of hydrocarbon removed by the DPE system, free product measurements for each monitoring event used for AFVR activities before and after the DPE event, and conclusions as to the efficiency of the AFVR implementation and recommendations for optimization and continued operation.

1.6.4 Quarterly Groundwater Sampling Event Report

Three quarterly groundwater sampling events will be done following the initial AFVR/DPE event. After each groundwater sampling event, a quarterly report will be prepared. These reports will include the results of all field and laboratory data collected during the sampling event.

1.6.5 Project Completion Report

The Project Completion Report will be submitted within 60 days of the completion of demobilization from the project site and/or all waste is properly disposed. CH2M HILL will submit a draft Project Completion Report to the Remedial Project Manager (RPM). This report will include a general description of project activities, conclusions, summary of analytical data, summary of waste quantities disposed, and supporting documentation.

2.0 Active Product Recovery

2.1 AFVR Method

AFVR is a DPE method that employs a modified vacuum truck to simultaneously conduct free product recovery and vapor extraction.

Vacuum extraction/recovery is used to remove free product along with some groundwater. Creation of a negative pressure gradient (vacuum) within the recovery well enhances removal of floating product and residual product trapped in soil pores above the water table. Vapor extraction is used to remove vapors from the vadose zone and enhance bioremediation in both the vadose zone and capillary fringe. The extraction of vapors promotes aeration of the unsaturated zone and increases oxygen levels in the unsaturated zone, thereby promoting aerobic biodegradation (natural attenuation).

The AFVR method consists of the following primary components:

- Recovery well and adjustable length product recovery pipe (0.5- to 1.0-inch diameter)
- Vacuum system capable of extracting liquids and vapors (portable vacuum truck)
- Free product storage drum or tank (vacuum truck)
- Off-gas treatment system with granular activated carbon (GAC) canisters, (as needed)

The AFVR method requires a mobile vacuum truck. A recovery well head device will be attached to each monitoring well using a cam-lock connection or a rubber boot. The recovery well head device will be connected to the vacuum truck by vacuum hoses and an off-gas treatment system will be connected to the outlet of the vapor exhaust from the vacuum truck.

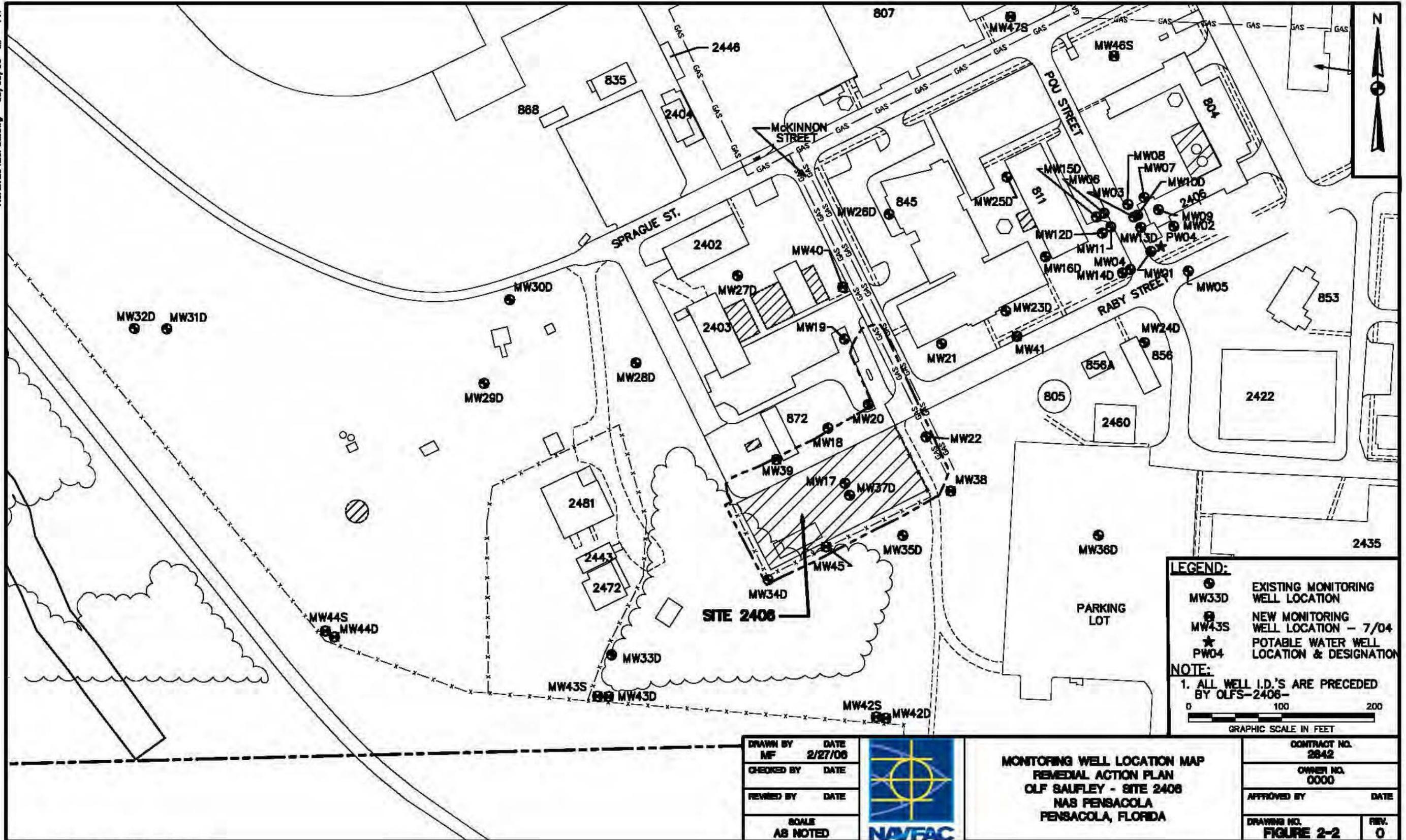
The product recovery pipe will be submerged below the surface of the product layer and located no greater than 6 inches into the water table of the monitoring well. Location of the recovery pipe will be adjusted as needed during system operation to recover as much free product as possible.

The depth to free product and depth to water will be measured in the recovery wells in the area monitoring wells using an electronic oil/water interface probe. Figure 2-1 shows the monitoring well locations.

2.1.1 Initial AFVR Event

The initial AFVR event will be conducted to determine radius of influence (ROI), to evaluate the need for volatile organic compound (VOC) emission control with GAC canisters, and to establish a site-specific procedure for conducting subsequent events, assumed to consist of the following activities:

- Collect water level and free product measurements in the DPE and observation wells.



- Perform AFVR operations, with onsite air sampling and off-gas treatment, on monitoring well (MW) 17 only as a worst-case situation. Based on the historical data, MW-17 contains more free product than any other well.
- Monitor AFVR operations effects (vacuums and water levels) in adjacent monitoring wells, including MW-18, -20, -22, -38, -39, and -45.
- Pending recovery results of MW-17, perform AFVR operation on MW-22, MW-18 and MW-20. MW-17 and MW-22 were identified in the RAP (TtNUS, 2006) to have the greatest free product thickness.
- During the initial event, establish a correlation between the results obtained from laboratory analyses of off-gas samples and field measurements using an organic vapor analyzer (OVA). This will allow use of the OVA as a real-time substitute for offsite laboratory analyses to determine whether off-gas treatment is warranted throughout the project.
- Determine if off-gas treatment will be necessary to meet air emission requirements for the subsequent events by evaluating the analytical results of the air samples collected and the duration of the events.

A TM detailing the results of the initial AFVR event and outlining the proposed path forward will be submitted to NAVFAC SE.

2.1.2 Subsequent AFVR Sampling Events

It is expected that no more than a total of seven events will be scheduled at 1-month intervals for the AFVR technology used at OLF Saufley. Each event will utilize a 4,000-gallon vacuum truck to apply the vacuum to the four wells for a period of 24 hours or until the vacuum truck is full. Two weeks after each AFVR event, the recovery wells will be checked for the presence of free product. The results will be recorded in the field logbook.

System monitoring will consist of documenting the system's operating data, such as vacuum on the wells, duration of applied vacuum, VOC concentration in off-gas, total collected free product/water, free product location, and thickness of free product in each monitoring well. CH2M HILL will also collect water/free product levels in all AFVR wells and selected monitoring wells at the site. The selected monitoring wells will be sampled for physical field parameters (dissolved oxygen [DO], turbidity, temperature, and pH) and laboratory analysis for VOCs, PAHs, and TRPH. The first sampling event will be conducted one quarter after the initiation of product recovery operations and will be followed by two more quarterly events.

2.1.3 Off-gas Treatment

The primary objective for the off-gas treatment will be to protect personnel and the environment during the AFVR events. Chapter 62-770 FAC stipulates emissions limitations if the total VOC discharge is greater than 13.7 pound per day. GAC will be used as necessary during off-gas treatment of the vapor phase emissions of VOC during the AVFR events. Based on the results of analyses conducted on initial event samples, CH2M HILL will determine if emission control is warranted for subsequent events. Real-time monitoring with an OVA will be conducted in subsequent events to document emission levels that

represent compliance with FAC 62-770. In subsequent events, exceedance of the value that represents compliance, as obtained from OVA monitoring of VOC concentrations in the vacuum truck exhaust, will result in system shutdown, and installation and use of GAC canisters.

As previously described, the results of the analytical data will be trended with the OVA/FID response obtained by field measurements to correlate the analytical results and the field OVA/FID response. This correlation will be utilized in the subsequent events to help calculate volatile mass removal and to gauge the mass of hydrocarbons that are being emitted into the atmosphere.

A total of 2,000 pounds of carbon vessels in a series will be used for the first event. Sizing the GAC canisters for subsequent events will depend on the VOC concentrations of the vapor phase, gas flow rate, and duration. It is assumed that the AFVR events will continue until either 5,000 gallons of water is removed, 24 hours elapses, or the carbon is consumed. Two 1,000-pound carbon vessels will be connected to evaluate breakthrough times. Air samples will be collected hourly from three system locations (influent, between, and effluent). It is anticipated that each 1,000-pound carbon vessel will breakthrough in approximately 3.5 hours at a flow rate of 400 standard cubic feet per minute (scfm).

Additionally, whole air samples will be collected in tedlar bags and shipped to an off site laboratory to test for total petroleum hydrocarbon (TPH).

For Health & Safety (H&S) purposes, ambient air concentrations for the site contaminants of concern shall not exceed 25 parts per million (ppm) VOC above background based on flame ionization detector (FID) readings in the breathing zone, or 0.5 ppm benzene based on Draeger tube analysis. If either limit is exceeded, an upgrade of personal protective equipment (PPE) to Level C will be initiated, or the vacuum truck operation will be halted until reduction of the exhaust concentrations that result in lowered breathing zone concentrations that comply with H&S standard operating procedures (SOPs) can be made through modifications or supplementary engineering controls.

2.1.4 Program Modification

If warranted on the basis of monitoring or well gauging data, the remedial approach will be modified to enhance product recovery by scheduling the AFVR events more frequently. Proposed modifications to the program will be based on initial sampling results and will be in accordance with procedures established in this Work Plan Addendum. Any major changes in activities will be documented in a revision to the Work Plan Addendum.

2.1.5 Remediation Objectives

Free product recovery will be considered complete at OLF Saufley when free product is removed to the greatest extent practicable from the recovery wells (free product thickness of less than 0.01 feet) and no visible free product (except for oil sheen) remains in the recovery well identified in the RAP.

2.1.6 Reporting

The maintenance data and data analysis will be summarized in TMs, which will include data tables, figures, recommendations, conclusions, and analytical data packages as applicable.

2.2 Groundwater Monitoring Procedures

2.2.1 Free product Thickness and Water Level Measurements

Free product thickness and groundwater levels will be measured in select wells prior to and during each remedial event using an electronic oil/water interface probe. Wells will be allowed to stabilize prior to taking the initial reading. The tape for the interface probe or water level indicator will be marked in increments of 0.01 feet. All measurements will be collected within a 24-hour period and recorded in the field logbook.

Free product thickness and groundwater levels will be measured using the following procedure:

1. Decontaminate the oil/water interface probe.
2. Unlock and uncap the recovery/monitoring well and locate the reference mark on the top of the well casing. Record the well number, date, and time in the logbook.
3. Allow the free product/water level in the well to stabilize prior to collecting measurements.
4. Lower the probe into the well until contact is made with free product or water.
5. If free product is detected, record the depth to product to the nearest 0.01 foot in the logbook. Continue to lower the probe until water is detected and record the depth to water to the nearest 0.01 feet in the logbook. Subtract the depth to product from the depth to water to determine the free product thickness.
6. If water is detected, record the depth to water to the nearest 0.01 feet in the logbook. Continue to lower the probe to the bottom of the well and record the total well depth to the nearest 0.01 feet in the logbook. Subtract the depth to water from the total well depth to determine the height of the water column.

2.2.2 Equipment Decontamination

Sampling methods and equipment have been selected to minimize decontamination requirements and reduce the possibility of cross-contamination. The following procedures will be used for all sampling equipment used to collect routine samples undergoing trace organic or inorganic analyses.

Reusable sampling equipment will be decontaminated before the initial sample is collected and between sampling locations using the following procedure:

1. Clean with potable water and Alconox® or equivalent phosphate free laboratory grade detergent using a brush, if necessary, to remove particulate matter and surface films.
2. Rinse thoroughly with potable water.

3. Rinse thoroughly with analyte-free (de-ionized [DI]) water.
4. Rinse thoroughly with isopropanol (pesticide-grade). Do not rinse polyvinyl chloride (PVC) or plastic items with isopropanol.
5. Rinse thoroughly with organic/analyte-free water.
6. Allow equipment to air dry.

The tape and probe for the interface probe or water level indicator will be decontaminated before the initial sample is collected and between sampling locations using the following procedure:

1. Wash with potable water and Alconox® or equivalent phosphate free laboratory grade detergent.
2. Rinse with potable water.
3. Rinse thoroughly with organic/analyte-free water.
4. Allow equipment to air dry.

2.2.3 Quarterly Groundwater Sampling

Quarterly groundwater sampling will be performed in accordance with the groundwater Sampling and Analysis Plan (SAP) provided in Section 3.

2.2.4 Data Collection Schedule

Field activities will be completed as described in Table 2-1.

TABLE 2-1
Field Activities

Field Activity	Frequency	Equipment	Sample Point
Depth to groundwater and free product thickness measurements	Before, during, and after product extraction events	Oil/water interface probe	MW-18, -20, -22, -38, -39, and -45
Groundwater sampling	Quarterly	Stainless steel submersible pump/control box, Horiba U-22 (or equivalent water quality meter), water level indicator, and a generator.	MW-17, -18, -20, and -22
Vapor flow rates	During multiphase extraction events	See Appendix B	Recovery wells
Vapor concentrations	During multiphase extraction events	FID/analytical	At emissions release point on vacuum truck (inlet and outlet of GAC off-gas treatment system)
Vacuum readings	Before and during multiphase extraction events	From gauge on vacuum truck or from the gauge on the AFVR extraction head unit	Well heads from source area and perimeter area wells

FID - flame ionization detection

2.3 Miscellaneous Monitoring

Monitoring using field instrumentation during active free product recovery events is outlined in Appendix B. Field equipment and monitoring instruments will be calibrated in accordance with manufacturers' instructions. Calibration information will be recorded in the field logbook.

3.0 Sampling and Analysis

This SAP describes CH2M HILL's tasks and responsibilities with respect to the sampling and analysis associated with the work effort described in this Work Plan Addendum. CH2M HILL intends this document to be a site-specific guide for use by the field team while performing the project-required sampling and analysis. Any changes to the activities described in this SAP must be documented as revision to this Work Plan Addendum and approved by the Project Manager and Project Chemist.

Samples will be collected in accordance with the EPA Region IV Environmental Investigative Standard Operating Procedures and Quality Assurance Manual (EISOPQAM), dated November 2001, and FDEP SOPs for Field Activities, DEP-SOP-001/01, dated February 1, 2004. Exemptions to these documents are outlined in this section. The sampling team will be qualified under the Navy Installation Restoration Chemical Data Quality Manual (IRCDQM) 1999 sampling requirements. FDEP SOPs will be followed for each sampling task.

A Navy-, U.S. Army Corps of Engineers (USACE)-, or Air Force Center for Engineering and the Environment (AFCEE)- and FDEP-approved laboratory will be used for all sample analyses.

- Three quarterly groundwater monitoring events will be conducted at OLF Saufley to assess the current extent of the chemicals of concern (COCs), which include:
 - BTEX by SW 846 Method 8260B
 - PAHs by EPA SW846 Method 8310
 - TRPH by FL-PRO
- Air samples will be taken at least daily during each AFVR event to determine the amount of volatile hydrocarbons removed during the AFVR events and to monitor carbon breakthrough, which will be noted as an increase in VOC concentration at the carbon system's exhaust point.

A total of 2,000 pounds of carbon vessels in a series will be used for the first event. Sizing the GAC canisters for subsequent events will be dependent on the VOC concentrations of the vapor phase, the gas flow rate, and the duration. It is assumed that the AFVR events will continue until either 5,000 gallons of water is removed, 24 hours elapses, or the carbon is consumed.

Two 1,000-pound carbon vessels will be connected to evaluate breakthrough times. Air samples will be collected at set intervals from three system locations (influent, between vessels, and effluent). It is anticipated that each 1,000-pound carbon vessel will breakthrough in approximately 5.5 hours at a flow rate of 400 scfm.

Initially, exhaust VOC concentrations and exhaust flow rates will be checked hourly until the optimum flow rate is established. A TVA 1000 multi-gas monitor will be used in its FID mode to analyze total VOC concentrations and the results recorded. The procedure for monitoring calls for the probe tip of the TVA 1000 to be inserted into the exhaust and

sample gas drawn until a stable reading is obtained. Using EPA Methods 1 & 2 (40 CFR Part 60 Appendix A), a measurement point will be selected and flow will be checked with a standard pitot tube with a magnehelic differential pressure gauge and converted to scfm (wet basis). To enable consistent tracking, flow measurements will be made at the same point each time, adjusted to a standard temperature of 25 degrees Celsius (°C), and no moisture correction will be made. Once flow rate is established, operation parameters will be collected at 15-minute intervals for the first 2 hours and at 30-minute intervals thereafter.

Additionally, integrated whole air samples will be collected via EPA Method 3 (40 CFR Part 60, Appendix A) at the final monitoring interval into tedlar bags and shipped to an offsite laboratory to test for TPH.

Field activities will be evaluated after the initial event and subsequent events may be modified as necessary.

3.1 Health and Safety

Health and safety hazards are associated with work to be performed under this contract. Therefore, work is anticipated to be conducted in Level D PPE, with provisions to upgrade to Level C protection as specified in the Site Specific Safety Plan (Appendix B).

3.2 Groundwater Monitoring

Groundwater samples will be collected from five groundwater-monitoring wells (MW-19, MW-21, MW-38, MW-39, and MW-45). Monitoring well locations are shown on Figure 2-1. The selected monitoring wells will be sampled for physical field parameters (dissolved oxygen, turbidity, temperature, pH, specific conductance, and oxygen reduction potential) and laboratory analysis for BTEX, PAHs and TRPH. The well will be purged prior to sampling as detailed in Section 3.4.2 of this Work Plan Addendum. The first sampling event will be collected within one quarter after the initiation of product recovery operations and quarterly for two additional quarters.

3.3 Air Monitoring

The objectives of air monitoring include:

- Verification of compliance with emission limitation at outlet of either GAC canister, if used, or the vacuum truck outlet
- Documentation of mass VOC removed from the soil
- Documentation of efficiency of the GAC canister
- Protection of onsite workers and local environment

During the AFVR events, emission levels will be determined to establish mass removal rates. In the case that GAC canisters are used, an air sample will be necessary both before and after the two GAC units in series. The sample before the GAC unit will be used to determine the mass VOC removed from the soil. The sample after the GAC canisters will

determine VOC remaining in the exhaust stream after treatment to ascertain compliance with the FDEP emission limitation. (Removal efficiency accomplished by the GAC canister, if used, can be calculated on either a mass [pounds per hour] or concentration basis [ppm].)

3.4 Data Quality Levels for Measurement Data

The data quality levels for each sampling task described above are listed in Table 3-1. The sampling events, the sampling and analytical requirements, and the required level of quality and data packages are listed in Table 3-2. The quantitation, project action, accuracy, precision, and completeness limits by which the data will be evaluated will be provided by the selected laboratory and approved by CH2M HILL’s Quality Assurance Chemist.

A Navy-, USACE-, or AFCEE-, and FDEP-approved laboratory will be used for all sample analyses. In addition, the laboratory will also follow FDEP SOPs.

A CH2M HILL Level C data package will be required along with appropriate Quality Control samples for the required analyses. All analytical data will be submitted by both hard copy and electronic files.

TABLE 3-1
Data Quality Levels

Sampling Activity	Data Quality Level Category
Groundwater Evaluation (offsite laboratory analyses)	Definitive
Liquid Waste Characterization (offsite laboratory analyses)	Definitive
Air Samples (offsite laboratory analysis/field screening)	Definitive

Groundwater data will be evaluated against the following FDEP groundwater cleanup levels:

- Benzene (1 microgram per liter [$\mu\text{g}/\text{L}$])
- Toluene (40 $\mu\text{g}/\text{L}$)
- Ethylbenzene (30 $\mu\text{g}/\text{L}$)
- Total Xylenes (20 $\mu\text{g}/\text{L}$)
- TRPH (5,000 $\mu\text{g}/\text{L}$)

TABLE 3-2
Sampling and Analysis Summary

Sample Task	Sample Point	Matrix	Sampling Frequency	Approximate Sample Number	Sampling Method ¹	Sampling Equipment ¹	TAT	DQO Level/ Data Package Requirement	Required Analysis	Analytical Method	Holding Time	Sample Preservative	Containers
Groundwater Sampling													
Groundwater Sampling	MW-19 MW-21 MW-38 MW-39 MW-45	Water	Quarterly	5 + 1 dup + 1 MS/MSD	Grab	Submersible Pump; Teflon Tubing (low flow technique)	14 days	DQO Level III, CH2M HILL Level C	VOCs	8260B	14 days	HCl pH< 2; Cool to 4°C	(3) 40 mL vial
									PAH	8310	7 days extr; 40 days analysis	Cool to 4°C	(2) 1L amber glass
									TRPH	FL-PRO	7 days extr; 40 days analysis	HCl pH<2; Cool to 4°C	(2) 1L amber glass
	Equipment Blank (Pre and Post)	Water	1 per 10 samples	1	Prepared in Field	Analyte-free water, SS funnel	14 days	DQO Level III, CH2M HILL Level C	VOCs	8260B	14 days	HCl pH< 2; Cool to 4°C	(3) 40 mL vial
									PAH	8310	7 days extr; 40 days analysis	Cool to 4°C	(2) 1L amber glass
	Trip Blank	Water	1 per cooler containing volatile samples	1	Prepared by Lab	N/A	14 days	DQO Level III, CH2M HILL Level C	TRPH	FL-PRO	7 days extr; 40 days analysis	HCl pH<2; Cool to 4°C	(1) 1L amber glass
									VOCs	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40 mL vial

Table 3-2 Sampling and Analysis Summary													
Sample Task	Sample Point	Matrix	Sampling Frequency	Approximate Sample Number	Sampling Method ¹	Sampling Equipment ¹	TAT	DQO Level/ Data Package Requirement	Required Analysis	Analytical Method	Holding Time	Sample Preservative	Containers
Liquid Waste Characterization Sampling													
Characterization of Decontamination Water	Decon Water	Water	As Required	1 (or as needed for disposal)	Grab	Drum thief or dip jar	14 days	CCI Level B	TCL VOC	8260B	14 days	HCl pH<2; Cool to 4°C	(3) 40 mL vials
									TCL SVOC	8270C	7 days extr; 40 days analysis	Cool to 4°C	(4) 1L amber glass
									TCL Pesticides	8081A	7 days extr; 40 days analysis		
									TCL Herbicides	8151A	7 days extr; 40 days analysis		
									PCB	8082	7 days extr; 40 days analysis		
									8 RCRA Metals	6010B/7470A	Mercury 28 days; all other metals 180 days	HNO3 pH<2	(1) 500ml HDPE
									TRPH	FL-PRO	7 days extr; 40 days analysis	Cool to 4°C	(1) L amber glass
									Corrosivity	9045C	As Soon As Possible	Cool to 4°C	(1) 250 mL amber glass
									Ignitability	1010/1030	As Soon As Possible		(1) L amber glass
Air Sampling													
Air Sampling	Pre GAC	Air	As Required	As Needed	Grab	Integrated bag sample	14 days	Level C	TPH	TO18	72 hours	None	Tedlar bag
	Post GAC	Air	As Required	As Needed	Grab	Integrated bag sample	14 days	Level C	TPH	TO18	72 hours	none	Tedlar bag
	Routine	Air	As specified in plan	As Needed	Portable Analyzer	TVA 1000	N/A	Level C	Real-time VOC	FID	N/A	N/A	N/A

Notes:

- 1) In accordance with FDEP SOPs
- MS/MSD matrix spike/matrix spike duplicate
- SS stainless steel
- DQO data quality objective
- HCl hydrochloric acid
- mL milliliters
- L liters
- TCL target compound list
- VOC volatile organic compounds
- SVOC semi-volatile organic compounds
- PCB polychlorinated biphenyl
- ASAP as soon as possible
- Turnaround Time (TAT) is in calendar days.

3.4.1 Water-level Measurements

Groundwater levels will be measured in monitoring wells prior to sampling. Water levels will be measured using an electronic water level indicator with tape graduated in 0.01 feet. Measurements will be recorded as depth to water or free product from the mark on the top of the well casing. Well number, date and time of measurement, depth to water, and total depth will be recorded in the field logbook.

3.4.2 Well Purging

Before sampling, each well will be purged using a low-flow, low-stress method to minimize both agitation of the groundwater and sample turbidity. The intent of this procedure is to remove stagnant water from the well and introduce fresh groundwater into the well at a rate that does not produce drawdown of the water table in the well being sampled. This procedure also reduces the time it takes to purge the wells and the quantity of water removed as investigation derived waste (IDW). The field team will keep the pumping rate as low as possible, being careful not to draw down the water level in the well. The anticipated pumping rate is 0.1 to 0.25 gallons per minute (gpm). Water level measurements will be made concurrently with the water quality parameter measurements. Additionally, the pump flow rate will be confirmed and recorded with each set of field measurements. Field measurements of DO, oxidation-reduction potential (ORP), turbidity, pH, temperature, salinity, and specific conductance will be made initially and at 5-minute intervals thereafter. The water quality parameters will be measured using a flow-through cell. Measurement data will be recorded on the Well Purging Form.

Three consecutive measurements of the five parameters listed below must be within the stated limits. The measurements evaluated must be the last three consecutive measurements taken before purging is stopped. The range between the highest and the lowest values for the last three measurements of temperature, pH and specific conductance cannot exceed the stated limits. The last three consecutive measurements of DO and turbidity must all be at or below the following thresholds:

- Temperature: $\pm 3^{\circ}\text{C}$
- pH: ± 0.1 Standard Units
- Specific Conductance: ± 5.0 percent of reading
- DO: ± 10 percent, whichever is greater
- Turbidity: ± 10 percent, whichever is greater

If the stabilization of these parameters cannot be met, and all attempts have been made to minimize the drawdown, the field team will check the water quality meter condition and calibration, purging flow rate, and all tubing connections to determine if they could be affecting the ability to achieve stable measurements. The field team leader will decide whether to collect a sample or to continue purging after five well volumes (via conventional purge) or five volumes of the screened interval (minimizing purge volumes per FDEP FS2200, Section 2.2). The parameters listed above will be documented in the logbook and the wells will be sampled.

In some cases the well recharge rate may not be sufficient to maintain well water level. In these cases the samples will be collected as soon as enough water recharges after purging.

Water samples will be preserved as required in Table 3-2 and will be delivered to the laboratory within established holding times. In addition to the groundwater samples, quality control (QC) samples will be collected according to Table 3-2.

3.4.3 Collecting Samples from Monitoring Wells

Samples will be collected using stainless steel submersible pump and Teflon® lined tubing. Once the field parameters have stabilized, the tubing leading to the flow-through cell will be removed. Headspace in the VOC sample container must be minimized by filling the sample vial until a positive meniscus is present. If any bubbles are present in the container upon closing, or any headspace is visible, a new container must be refilled.

Containers will be quickly and adequately sealed by using Teflon®-lined screw lids. Sample containers will be properly labeled according to EPA procedures. The samples will be immediately cooled to 4°C ±2°C, and this temperature should be maintained through delivery to the laboratory until the samples are analyzed. New or dedicated tubing should be used and the pump decontaminated for each well.

3.4.4 Decontamination and Purge Water Sampling

Decontamination and purge water will be contained in drums. The liquid waste samples will be collected in the following manner and analyzed in accordance with Table 3-2.

- Using a bailer or dip jar, collect a water sample from its containmentment.
- Fill sample containers for volatile analyses. The 40-ml vials will be filled so that there is no headspace in each vial.
- Fill the sample containers for the remaining analyses.
- Label and package the samples for shipment to the laboratory.

3.5 Sample Documentation

Sampling documentation will include the following:

- Numbered Chain-of-Custody Reports
- Name of laboratories and contacts to which the samples were sent, turnaround time (TAT) requested, and data results, when possible
- Termination of a sample point or parameter and reasons
- Unusual appearance or odor of a sample
- Measurements, volume of flow, temperature, and weather conditions
- Additional samples and reasons for obtaining them
- Levels of protection used (with justification)
- Meetings and telephone conversations held with the NAVFAC SE Navy Technical Representative (NTR), regulatory agencies, project manager, or supervisor

- Details concerning any samples split with another party
- Details of QC samples obtained
- Sample collection equipment and containers, including their serial or lot numbers
- Field analytical equipment, and equipment utilized to make physical measurements will be identified
- Calculations, results, and calibration data for field sampling, field analytical, and field physical measurement equipment
- Property numbers of any sampling equipment used, if available
- Sampling station identification
- Date and Time of sample collection
- Description of the sample location
- Description of the sample
- Sampler(s)' name(s) and company
- How the sample was collected
- Diagrams of processes
- Maps/sketches of sampling locations
- Weather conditions that may affect the sample (e.g., rain, extreme heat or cold, wind, etc.)
- Sample Labels
- Custody Seals (minimum of two on each shipping container)

3.6 Field Quality Control

Field duplicate samples and equipment blank samples will be collected at a minimum frequency of 10 percent and rounded to the nearest whole number. Pre- and post-equipment blanks will be collected at a minimum of 5 percent or daily and rounded to the nearest whole number. One trip blank sample will be provided at a frequency of one per sample cooler containing volatile samples. Matrix spike/matrix spike duplicates (MS/MSD) will be required at a frequency of one per sample event or a minimum of 5 percent of the total number of samples collected and rounded to the nearest whole number. Quantity and frequency are detailed in Table 3-2.

3.7 Analytical Methods

Samples will be collected for analytical methods summarized in Table 3-2.

Preliminary analytical results will be faxed to Ms. Bethany Garvey at the following fax number per the TATs listed in Table 3-2 from day of sample receipt. The final hardcopy data and electronic file will be delivered to Ms. Kama White within 14 days of sample receipt.

Bethany Garvey
CH2M HILL
1000 Abernathy Place, Suite 1600
Atlanta, GA 30328
770.604.9095 ext 54124
EFax: 678.579.8176
Bgarvey@ch2m.com

Kama White
CH2M HILL
1000 Abernathy Place, Suite 1600
Atlanta, GA 30328
770.604.9095 ext 54385
Efax: 770.604.9282
Kama.white@ch2m.com

4.0 Health and Safety Plan

Health and safety are of paramount importance for CH2M HILL in conducting any field activity. Project personnel assigned to this project will be properly trained and certified in accordance with Occupational Safety and Health Administration (OSHA) regulations. A project Health and Safety Plan is included as Appendix B. Project personnel working in the OLF Saufley remedial areas are required to review the Health and Safety Plan as part of site orientation activities. A copy of the Health and Safety Plan will be present onsite at OLF Saufley while product recovery and groundwater monitoring activities are conducted.

5.0 Quality Control Plan

This Quality Control Plan identifies the quality administrators, the project organization for the work to be completed under CTO 0019, and the definable features of work (DFOWs) for the project.

The Submittal Register, included in Appendix C of this Work Plan Addendum, documents submittals in accordance with CH2M HILL's Contract Management Plan (CH2M HILL, revised 2005). CH2M HILL, the Navy, or others will approve submittals as identified in the Submittal Register. All approved submittals will be distributed by CH2M HILL to the appropriate Navy personnel [Contracting Officer (CO), Resident Officer In Charge of Construction (ROICC) (in duplicate), etc.], the project site, and to the project file.

The program-specific project organization chart (Figure 5-1) depicts the chain of command for this CTO and the individuals responsible for executing the work as indicated. Individual roles and responsibilities of CTO personnel are summarized in Table 5-1.

5.1 Project QC Manager

The Project QC Manager will be Ms. Phyllis Zerangue. The appointment letter for Ms. Zerangue is provided in Appendix C.

5.2 Testing Requirements

The project activities will include field screening and testing of groundwater and air. The field measurements (Section 3.0) will be conducted in accordance with QC requirements specified in FDEP SOPs Department of Environmental Regulation DEP-SOP-001/01, EPA Region IV EISOPQAM, November 2001), and as outlined in this Work Plan Addendum.

5.2.1 Construction Testing

No construction testing is anticipated for work under this CTO. However, should construction testing become necessary, the laboratory used will be certified by the National Institute of Standards and Technology (NIST), National Voluntary Laboratory Accreditation Program (NVLAP), American Association of State Highway and Transportation Officials (AASHTO), or American Association for Laboratory Accreditation (AALA).

5.2.2 Environmental Testing

A Navy-, USACE-, or AFCEE- and FDEP-approved laboratory will be used for all sample analyses.

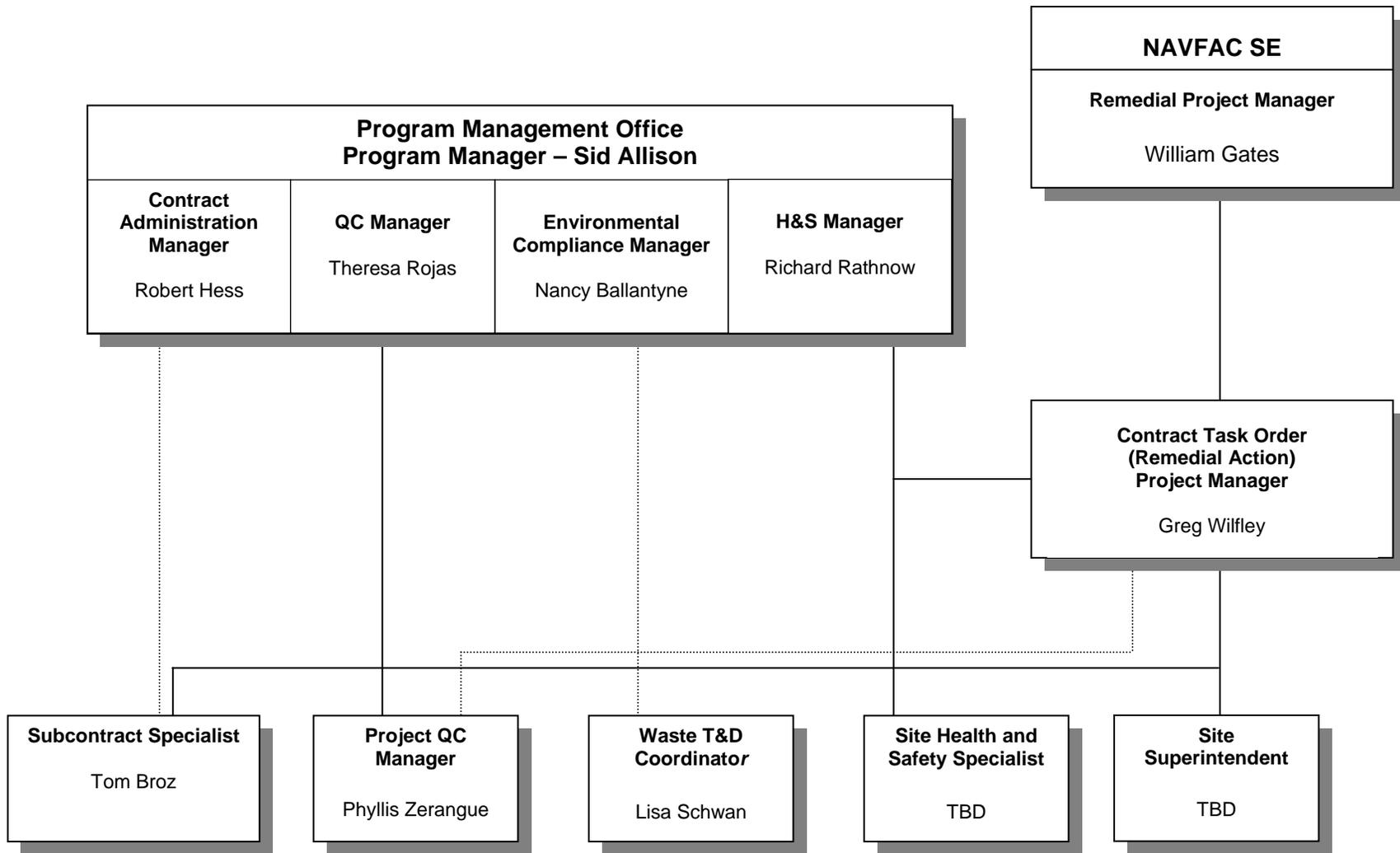


FIGURE 5-1
Organizational Chart

TABLE 5-1
Roles, Responsibilities, and Authorities of Key Project Personnel

Role	Responsibility	Authority
Project Manager	<ul style="list-style-type: none"> Management and Technical Direction of work Communicate with Southeast RPM and NTR Oversee subcontractor performance Select CTO staff Develop CTO Work Plan and supporting plans Meet CTO Performance Objectives Prepare status reports Prepare Field Change Requests 	<ul style="list-style-type: none"> Approve subcontractor selection Approve invoices to Southeast Approve CTO baseline schedule Stop work at the site for any reason Approve payment to vendors and suppliers Approve payment to subcontractors Review technical qualifications of subcontractors Respond to Design Change Notices
Site Superintendent	<ul style="list-style-type: none"> Responsible for all site activities Provide direction to subcontractors Act for Project Manager Provide daily status reports Prepare CTO Work Plan Conduct daily safety meetings Review subcontractor qualifications Stop work for unsafe conditions or practices 	<ul style="list-style-type: none"> Stop work for subcontractors Approve corrective action for site work-arounds Approve materials and labor costs for site operations Resolve subcontractor interface issues Approve daily and weekly status reports
Project QC Manager	<ul style="list-style-type: none"> Monitor and oversee subcontractor compliance with scope of work Review requests for changes in scope of work Recommend improvements in work techniques or metrics Recommend work-around to Site Superintendent Monitor and report on subcontractor quality and quantities Audit subcontractors offsite fabrication Maintain Submittal Register Participate in Incident-Free Operations conference call 	<ul style="list-style-type: none"> Complete daily compliance report Monitor and report on subcontractor quality and quantities Audit subcontractors offsite fabrication Maintain Submittal Register Stop work for non-compliant operations Maintain Rework Items list Stop work for non-compliant operations
Site Health and Safety Specialist	<ul style="list-style-type: none"> Monitor and report on subcontractor safety and health performance Record and report safety statistics Conduct needed site safety and health orientation Maintain Environmental Log Stop work for unsafe practices or conditions 	<ul style="list-style-type: none"> Stop work for unsafe practices or conditions Approve subcontractor site-specific health and safety plan Set weekly safety objectives Approve resumption of work for resolved safety issues
Subcontract Specialist	<ul style="list-style-type: none"> Prepare bid packages Purchase disposable materials Maintain subcontract log Approve payables for disposable items Maintain government property records 	<ul style="list-style-type: none"> Provide project scheduling coordination Responsible for site cost tracking and reporting Maintain record of site purchases

5.3 Construction Inspection

The construction inspections anticipated for the remediation activities OLF Saufley will be performed in accordance with the three phases of control while performing the work. The DFOW activities included in this Work Plan Addendum are: mobilization and site preparation, groundwater sampling, free product recovery activities, waste sampling, waste management, and demobilization. The construction quality controls applicable to the respective product recovery methods described in Section 2 of this Work Plan Addendum are outlined in the following subsections.

5.3.1 Mobilization/Site Preparation

As part of the mobilization activity, a pre-construction meeting will be held to review the preparedness to begin the project and the procedures and schedule to complete the project. The preparedness check will verify that the permitting/approvals are in place for the planned remediation activities, and that the materials and equipment mobilized to the field have been inspected, are in conformance with the project specifications and are in good working condition to commence the work.

QC procedures for mobilization/site preparation include:

Task	Procedures/Construction Details
Pre-construction Meeting	<ul style="list-style-type: none">• Verify designated locations of equipment layout, material and waste staging, and decontamination
Site Walk	<ul style="list-style-type: none">• Verify site layout plan• Verify Environmental Conditions Report
Pre-construction Submittals	<ul style="list-style-type: none">• Subcontractor plans and specifications• Subcontractor personnel qualification and certifications
Temporary Facilities	<ul style="list-style-type: none">• Verify temporary facilities for conformance with OLF Saufley requirements• Verify utility location, marking, and protection, if necessary

5.3.2 Groundwater Sampling

CH2M HILL will collect representative samples of groundwater in selected monitoring wells and ship them to the offsite laboratory for analyses. Sample collection and documentation will follow protocols included in the sampling and analysis section of this Work Plan Addendum. Environmental samples will be collected in accordance with FDEP methods and procedures and as stated in this Work Plan Addendum. Other controls will include, but are not limited to, maintaining a chain of custody; proper handling, packing, and shipping; and the use of a certified offsite laboratory.

Preparatory Phase

The preparatory phase for sample collection activities includes a review of the sampling procedures provided in the sampling and analysis plan, verifying acceptance of the selected laboratory for offsite sample testing, and confirming that the appropriate equipment and materials are available to complete the sampling activities. A CH2M HILL Project Chemist will schedule and coordinate data management with the offsite laboratory project manager and the CH2M HILL quality assurance group.

Initial Phase

Samples will be collected and subsequently analyzed at an approved laboratory in accordance with methods outlined in the project specific SAP. Sample collection activities including proper chain-of-custody documentation will follow the protocols outlined in the project-specific SAP. The Project QC Manager will observe the sampling activities to ensure that the protocols are followed correctly. Any deviations will be corrected and documented.

Follow-up Phase

Sample collection locations and activities will be properly documented throughout each sampling event. Analytical reports from the approved laboratory will be reviewed for accuracy and completeness. If required, data quality and quality assurance information from the laboratory will be reviewed to verify discrepancies in the analytical data. CH2M HILL quality assurance (QA) personnel will review and tabulate laboratory confirmation data and field sampling results. Environmental samples will be collected in accordance with EPA methods and procedures.

Sampling inspections include:

Task	Procedures/Construction Details
Field Sampling	<ul style="list-style-type: none">• Verify appropriate sampling equipment and proper decontamination• Document pertinent sampling location information• Acquire copy of offsite laboratory certification• Verify appropriate facilities and testing equipment are available and comply with testing standards• Verify the field instruments are calibrated in accordance with manufacturers' recommendations• Verify recording forms, including all of the test documentation requirements, have been prepared and are accurate and complete

5.3.3 Free Product Recovery Activities

Free product recovery will be accomplished utilizing a vacuum truck to extract free product above groundwater and petroleum vapors from the vadose zone. Initially, depth to free product and/or groundwater measurements will be collected from selected monitoring wells. AFVR will be performed on wells containing free product thickness greater than 0.01 feet. To optimize the potential for product recovery (and less groundwater), the vacuum pressure will be maintained below 21 inches of mercury (Hg) within all wells during extraction. Optimal vacuum pressures will be determined in the field based on specific field conditions with input from the vacuum truck operator.

Field data collection and relevant controls include:

Field Parameter	Requirement/Controls
Free product thickness/depth to water	<ul style="list-style-type: none">• Measure from mark at top of casing to nearest 0.01 feet
Volume of fluids collected at end of extraction/recovery events	<ul style="list-style-type: none">• Measure the depth to free product and the depth to water within the temporary collection chamber of the AFVR system, determine the volumes of water and free product and record
Vacuum pressure	<ul style="list-style-type: none">• Measure in inches of mercury (Hg) at the well heads from the recovery well and from nearby wells (non-AFVR wells)
VOC removal	<ul style="list-style-type: none">• Field screening/laboratory samples

Additionally, the piping and connections will be inspected during AFVR events with the results documented in the daily quality control reports. The combined volume of water and free product removed from the individual recovery wells will be recorded and tracked during each AFVR event. Appropriate spill prevention controls and PPE will be used. The Project QC Manager will maintain current records of the status of each recovery well, and will verify the accuracy and completeness of the well data recorded during each product recovery event. Waste tracking records will be updated during each site visit and reported accordingly.

5.3.4 Waste Sampling

CH2M HILL will collect representative samples of generated wastes and ship them to the offsite laboratory for analyses. The sampling will be conducted for waste characterization purposes. Sample collection and documentation will follow protocols included in the sampling and analysis section of this Work Plan Addendum. Environmental samples will be collected in accordance with EPA methods and procedures. Other controls will include, but are not limited to, maintaining a chain-of-custody; proper handling, packing, and shipping; and the use of a certified offsite laboratory.

Preparatory Phase

The preparatory phase for sample collection activities includes a review of the sampling procedures provided in the SAP, verifying acceptance of the selected laboratory for offsite sample testing, and confirming that the appropriate equipment and materials are available to complete the sampling activities. A CH2M HILL Project Chemist will schedule and coordinate data management with the offsite laboratory project manager and the CH2M HILL QA group.

Initial Phase

Samples will be collected and subsequently analyzed at an approved laboratory in accordance with methods outlined in the project specific SAP. Sample collection activities including proper chain-of-custody documentation will follow the protocols outlined in the project specific sampling and analysis plan. The Project QC Manager will observe the sampling activities to ensure that the protocols are followed correctly. Any deviations will be corrected and documented.

Follow-up Phase

Sample collection locations and activities will be properly documented throughout each sampling event. Analytical reports from the approved laboratory will be reviewed for accuracy and completeness. If required, data quality and QA information from the laboratory will be reviewed to verify discrepancies in the analytical data. CH2M HILL QA personnel will review and tabulate laboratory confirmation data and field sampling results.

Sampling inspections include:

Task	Procedures/Construction Details
Field Sampling	<ul style="list-style-type: none"> • Appropriate sampling equipment and proper decontamination • Document pertinent sampling location information • Acquire copy of offsite laboratory certification • Verify appropriate facilities and testing equipment are available and comply with testing standards • Verify the field instruments are calibrated in accordance with manufacturers' recommendations • Verify recording forms, including all of the test documentation requirements, have been prepared and are accurate and complete

The Project QC Manager and/or Project Superintendent will verify conformance with the field requirements.

5.3.5 Waste Management

Wastes will be characterized, managed, transported, and disposed of in accordance with the SAP and Waste Management Plan of this Work Plan Addendum.

Waste Management inspections include:

Task	Procedures/Construction Details
Characterization Sampling	<ul style="list-style-type: none"> • Perform waste characterization sampling in accordance with disposal facility requirements • Verify laboratory and qualifications • Verify appropriate sampling equipment
Waste Disposal	<ul style="list-style-type: none"> • Verify waste profile completion (obtain Navy Signature) • Approximate quantity of free product vs. waste water • Inspect waste transport vehicles and/or containers prior to acceptance to job site and before leaving job site • Transporter and Disposal facility certificates • Waste storage area inspection, at least weekly

5.3.6 Demobilization

CH2M HILL and its subcontractors will demobilize equipment and personnel from the site following the completion of the work activities identified in this Work Plan Addendum. The Project QC Manager will verify that the objectives of associated remedial activities have been met.

Preparatory Phase

The preparatory phase will include a review of decontamination procedures, the site specific Health and Safety Plan and relevant Activity Hazard Analysis forms (Appendix B), and the Waste Management Plan (Section 6.0).

Initial Phase

The Site Superintendent will perform inspections to confirm that the objectives of the decontamination demobilization activities have been met and that the rework items, if any, have been completed to the satisfaction of CH2M HILL and OLF Saufley.

Follow-up Phase

The Project QC Manager will provide continuous oversight of demobilization to verify that the work is completed in accordance with the requirements provided in the Work Plan Addendum. Daily observation will verify compliance with the objectives of the Work Plan Addendum. Deficiencies will be noted and corrected.

Demobilization inspections include:

Task	Procedures/Construction Details
Demobilization	<ul style="list-style-type: none">• Conduct pre-final site inspection and develop punch-list items• Inspect work areas to ensure all temporary facilities, equipment and materials are safely removed from the site• Verify equipment decontamination• Conduct completion inspection when work is substantially complete• Develop and execute punch-lists on outstanding items• Ensure project housekeeping and final project cleaning• Collate site records and documents• Submit final reports and deliverables• Complete resolution of punch-list items• Conduct final site inspection• Ensure orderly site demobilization

6.0 Waste Management Plan

This Waste Management Plan describes the requirements and procedures for managing wastes and recovered product generated during product removal activities at OLF Saufley. The wastes and materials associated with the program may include:

- Liquids associated with petroleum free product recovery, including:
 - Recovered free product
 - Mixture of free product and groundwater
 - Contaminated groundwater
- Decontamination wastes (piping, hose, PPE, sampling tools/containers, etc.)
- Uncontaminated general construction debris (such as caution tapes, barricades, signs, packing materials)

Waste will be generated from several sources related to work performed under the scope of services. The sources include, but are not limited to:

- AFVR events
- Well purging and groundwater sampling

For the initial event, waste will be stored in the program areas either in poly or frac tanks pending waste characterization. AFVR events generate high volumes of waste, and such waste will be emptied (transferred) into frac tanks.

For subsequent events, the vacuum truck will transport waste water directly to the disposal facility. Waste will be properly managed and disposed as discussed in this section.

6.1 Waste Characterization

In some cases, offsite facilities may require additional analyses to evaluate the waste stream prior to acceptance. All wastes will be classified as required in FAC Chapter 62-730 Part I, "Hazardous Waste Rule - Definition and Identification" and the Resource Conservation and Recovery Act (RCRA). Uncontaminated wastes and debris will be characterized using process knowledge and generally will be classified as municipal solid waste.

Waste characterization information will be documented on a waste profile form provided by the offsite treatment or disposal facility as part of the waste acceptance process. An approved copy of the waste profile will be received prior to offsite transportation of the material. If generator certification and/or signature are required, Navy personnel will provide it.

The profile typically requires the following information:

- Generator (Navy) information including name, address, contact, and phone number

- Base/installation EPA Identification Number [and state identification (ID) number, if applicable]
- Site name including street/ mailing address (Note: Mailing Address will be the address to which executed manifests will be sent)
- Activity generating waste (e.g., petroleum contamination cleanup)
- Source of contamination
- Historical use for area
- Physical state of waste (e.g., solid, liquid, etc.)
- Applicable hazardous waste codes
- Other chemical/ physical characteristics (color, odor, flash point, pH, etc.)

6.2 Waste Management

The following subsections include procedures for managing wastes in accordance with best management practices, as well as in compliance with applicable laws and regulations.

6.2.1 Waste Storage Time Limit

Hazardous waste must be removed within 90 days from the date of generation; other wastes will be removed from the site as soon as possible. The date of generation is the day that a waste is **first** placed in a container or tank.

6.2.2 Labels

All containers/ drums, tanks, and roll-off boxes will bear clearly visible labels.

If analytical results indicate that the tank contents are hazardous, the tank (or other container if the contents are transferred) will be labeled with a pre-printed "Hazardous Waste" label, which includes the following information:

- Accumulation start date (date waste first placed into container)
- Generator Name: United States (U.S.) Navy
- EPA ID number for site
- RCRA Waste codes
- Department of Transportation (DOT) description/ shipping name (e.g. "Hazardous waste, liquid, n.o.s., 9. NA3082, III")

For containers of less than 110 gallons, the manifest number must be on the label before transporting.

If analytical results indicate that the tank contents are non-hazardous, the tank (or other container if the contents are transferred) will have pre-printed "**Non-Hazardous Waste**" labels that include the following information:

- Accumulation start date
- Generator Name: U.S. Navy

- Site EPA ID Number
- Waste-specific description (e.g., petroleum-contaminated groundwater)

Until a waste has been characterized and classified, the pre-printed “**Analysis Pending**” label or “**Waste Material**” (or an equivalent label) will be used. This waste label will contain the equivalent information provided on a Hazardous Waste label, including:

- Accumulation start date
- Generator Name: U.S. Navy
- Site EPA ID Number
- Waste-specific description (e.g., petroleum-contaminated groundwater)

6.2.3 Waste Management Requirements

All wastes will be contained in a manner that prevents the spread of contamination. Unless the Navy has designated a specific waste storage area, wastes will be accumulated (and stored) near the project site. These waste storage areas will be under CH2M HILL control.

Waste-specific requirements include the following:

- All liquids will be contained in compatible drums or portable tanks. Recovered free product will be segregated from other liquids, as appropriate, to facilitate recycling.
- Contaminated waste (soil, PPE, etc.) will be contained in drums or tanks pending offsite disposal or recycling.
- Containers will be properly secured when not in use and at the end of each work day.

6.2.4 Waste Management Areas

Procedures for drums and portable tanks are described below.

Drums/Small Containers

- Drums and small containers of waste may be stored at the tank location, or may be transported to a temporary accumulation area. These drums should be transported onsite on wood pallets and secured together with non-metallic bonding.
- Drums will be inspected and inventoried upon arrival onsite for signs of contamination and/or deterioration.
- Adequate aisle space (e.g., 30 inches) will be provided for containers such as 55-gallon drums to allow the unobstructed movement of personnel and equipment. A row of drums should be no more than two drums wide.
- Each drum will be provided with its own label and project-specific tracking/identification number.
- Drums will remain covered except when waste is removed from or added to the drum. Covers will be properly secured at the end of each workday.

- Drums will be disposed of with the contents. If the contents are removed from the drums for offsite transportation and treatment or disposal, the drums will be decontaminated prior to re-use or before leaving the site.
- Secondary containment will be provided for drums of liquid waste.

Portable Tanks

- Only non-stationary tanks (such as steel cargo tanks, wheeled tankers, or frac tanks) will be used to accumulate liquid wastes.
- Tanks will be inspected upon arrival onsite for signs of deterioration and contamination. Any tank arriving onsite with contents or physical evidence (e.g., residue or odor) of contamination will be rejected.
- Tanks will be provided with covers.
- Each tank will be labeled.
- Tanks will be provided with secondary containment.

6.2.5 Security and Contingency Planning

Emergency response equipment including fire extinguishers, decontamination equipment, and an alarm system (if radio equipment is not available to CH2M HILL and subcontractor personnel) will be available at all waste and fuel storage areas. This equipment will either be provided at the waste storage area, or in personnel vehicles. Spill control equipment/material (e.g., sorbent pads) will be available in all waste and fuel storage areas and where liquids are transferred from one vessel to another.

Security will be provided in waste storage areas. Because the waste contents are unknown, a barrier, such as barricade tape or temporary fencing, should be provided. Additionally, signs will be posted at storage areas that are unmanned for more than 24 hours, identifying appropriate CH2M HILL personnel and phone numbers to contact in an emergency.

6.2.6 Waste/Product Storage Area Inspections

Areas used for waste and recovered product storage will be inspected for malfunctions, deterioration, discharges, and leaks that could result in a release. The following inspection schedule will be followed at least on a weekly basis:

- Inspection of containers, drums, and tanks (for leaks, signs of corrosion, or signs of general deterioration).
- Inspection of product storage areas (e.g., evidence of corroding containment systems and rusting tanks/ancillary equipment).

If operations will be suspended such that waste storage areas cannot be inspected weekly, all hazardous, free-product, and petroleum-contaminated wastes will be removed from the site. Inspections will be recorded in the Contractor Quality Control Report or otherwise documented, and copies of the report will be maintained onsite, available for review.

6.3 Transportation

Each transportation vehicle and load of waste will be inspected before leaving the site. The quantities of waste leaving the site will be recorded. A contractor licensed for commercial transportation will transport non-hazardous wastes. In the event that wastes are hazardous, the transporter will be licensed in accordance with 49 CFR 171-179. A copy of the documentation indicating that the selected transporter has appropriate licenses will be received prior to transport of any waste material.

6.3.1 Manifests/Shipping Documentation

Each load of waste material will be manifested prior to leaving the site. At a minimum, the manifest form will include the following information:

- Transporter information including name, address, contact and phone number
- Generator information including name, address, contact, and phone number
- Site name including street/ mailing address
- Generator's EPA ID Number
- Transporter's EPA ID Number (for hazardous shipments) or State ID Number
- Description of waste (DOT Proper Shipping name, Hazard Class, United Nations Number, and Packing Group numbers required for hazardous waste/hazardous materials shipments)
- Type of container
- Quantity of waste (volumetric estimate)
- Additionally, each shipment of waste will also have a waste profile, a Land Disposal Restriction (LDR) notification/certification for hazardous wastes, and a haul ticket.

For hazardous waste, if the signed manifest from the designated offsite facility is not received within 35 days, CH2M HILL will contact the transporter or the designated facility to determine the status of the waste. If the signed hazardous waste manifest has not been received within 45 days, CH2M HILL will prepare an "Exception Report" for the Navy to submit to the State of Florida, as required under 40 CFR 262.42.

6.3.2 Transporter Responsibilities

In general, the transporter will be responsible for weighing loads at a certified scale. For each load of material, weight measurements will be obtained for each full and empty container, dump truck, or tanker truck. Disposal quantities will be based on the difference of weight measurements between the full and empty container, dump truck, or tanker truck. Weights will be recorded on the waste manifest. The transporter will provide copies of weight tickets with the final manifest to CH2M HILL. Manifest copies will be sent via trackable means (Certified U.S. Mail, UPS, Federal Express, DHL, courier service, etc.) to the attention of Ms. Lisa Schwan at the following address: CH2M HILL, 1000 Abernathy Road, Suite 1600, Atlanta, GA 30328, phone 770-604-9182 ext. 54312.

The transporter will observe the following practices when hauling and transporting wastes offsite:

- Minimize impacts to general public traffic.
- Repair road damage caused by construction and/or hauling traffic.
- Cleanup material spilled in transit.
- Line and cover trucks/trailers used for hauling contaminated materials to prevent releases and contamination.
- Decontaminate vehicles prior to re-use, other than hauling contaminated material.
- Follow safety and spill response procedures outlined in the Health and Safety Plan.
- Ensure that no materials from other projects are combined with materials from OLF Saufley.
- Seal trucks transporting liquids.

Spill Reporting

In the event of a spill or release of any waste, the transporter must immediately notify CH2M HILL. The pertinent facts and information about the spill will be reported to CH2M HILL and recorded, including:

- Type of material (e.g., soil, sludge, water) and contaminant
- Location
- Estimated volume
- Media affected (e.g., spilled on concrete pad or soil)
- Time of spill/release
- Final disposal of spilled material

The transporter will also report any spill or release of hazardous waste, as required by 49 CFR 171.15, to the National Response Center (NRC) at 800-424-8802 or 202-426-2675. The transporter must also report in writing, as required by 49 CFR 171.16, to the Director, Office of Hazardous Materials Regulations, Materials Transportation Bureau, Department of Transportation, Washington, DC 20590.

For any spill of hazardous waste water from a bulk shipment (e.g., tanker), the transporter will immediately notify the NRC (800-424-8802 or 202-267-2675), as required in 40 CFR 263.30.

Spill Response

The transporter will clean up any spill or release of waste (including soil or water) that occurs during transportation, or take such action as may be required or approved by federal, State, or local officials. Spilled waste will be immediately cleaned up, including soils on the outside of the trucks or other container (e.g., railcar) and on the ground or road surface. Where appropriate, the spilled material (e.g., soil) will be returned to the original waste container. In any case, the spilled material will be properly contained and disposed.

6.3.3 Transportation and Disposal Log

Transportation of wastes will be inventoried the day of transportation from the site using the Transportation and Disposal (T&D) Log. A photocopy of the initial manifest form for each load will be retained onsite and attached to the Daily Production Report. All required transportation manifests will be prepared by CH2M HILL and signed by an OLF Saufley representative.

6.4 Disposal of Waste Streams

Offsite treatment or disposal facilities will use the waste profile and supporting documentation (e.g., analytical data) to determine whether they will accept a waste. Recovered petroleum will be recycled and/or used for energy recovery whenever possible. Otherwise, recovered petroleum will be characterized and disposed as a solid waste.

- Any waste that is classified as hazardous will be sent to an offsite, permitted, RCRA Subtitle C treatment, storage, or disposal facility.
- Non-hazardous wastes will be disposed at an offsite RCRA Subtitle D facility permitted to receive such wastes.
- Liquid wastes may be disposed onsite with written permission or approval from the Base, or disposed offsite at a facility permitted to accept the waste (e.g., aqueous hazardous wastes to a Subtitle C facility).
- Uncontaminated construction debris may be sent to municipal landfills, or landfills designated for construction/demolition debris.
- Recovered petroleum free product (fuels) may be recycled at a Base-approved facility.

The treatment or disposal facility will be responsible for providing a facility-executed copy of the final waste manifest and for a certificate of treatment or disposal for each load of waste received.

6.5 Training

Training requirements for onsite personnel, including subcontractors, is provided in the site-specific Health and Safety Plan (Appendix B).

6.6 Records/Reporting

The following records and documents will be maintained:

- Transportation and offsite disposal records, including:
 - Profiles and associated waste characterization data
 - Manifests, LDR notifications/certifications, bills of lading, and other shipping records
 - Offsite facility waste receipts, certificates of disposal/destruction

- Training records
- Inspection records
- CH2M HILL will maintain Material Data Safety Sheets (MSDS) for chemicals and/or hazardous materials brought onsite, including the MSDS for chemicals brought onsite by subcontractors.

7.0 References

CH2M HILL Constructors, Inc. 2005. *Construction Management Plan, Contract No. N62467-01-D-0331*. September.

Tetra Tech NUS, Inc. 2006. *Remedial Action Plan for Underground Storage Tank, Site 2406, Outlying Landing Field Saufley, Naval Air Station Pensacola, Pensacola, FL*. August.

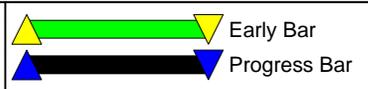
U.S. Environmental Protection Agency. 2001. *Region IV Environmental Investigations Standard Operating Procedures and Quality Assurance Manual*. November.

Appendix A

Project Schedule

Activity ID	WBS	% Comp	Activity Description	Org Dur	Rem Dur	Early Start	Early Finish	2008												2009			
								J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A
CTO #0019 - Saufley - NAS Pensacola																							
Total		3		360	211	29MAY07A	24OCT08																
PHASE 3																							
Subtotal		3		360	211	29MAY07A	24OCT08																
PROJECT MANAGEMENT																							
Subtotal	PA.01.01.01	13		261	211	29MAY07A	24OCT08																
PROJECT MANAGEMENT																							
ASPMAL0101	PA.01.01.01	13	PMO	261	211	29MAY07A	24OCT08																
SITE 2406 DPE/AFVR																							
Subtotal		0		273	211	01OCT07A	24OCT08																
PROJECT MANAGEMENT																							
AS99220103	99.22.01.03	5	CCI Management, Office Off-Site	217	211	01OCT07A	24OCT08																
AS99220101	99.22.01.01	0	CCI Project Management, Field	172	172	31DEC07*	29AUG08																
AS99220102	99.22.01.02	0	CCI Management, Office On-Site	172	172	31DEC07	29AUG08																
MOBILIZATION & PREPARATORY WORK																							
AS99010290	99.01.02.90	0	CTO Kick-Off Meeting	1	1	22FEB08	22FEB08																
AS99010291	99.01.02.91	0	CCI Mobilization	1	1	25FEB08	25FEB08																
AS99010401	99.01.04.01	0	Initiate Job-Site Presence	1	1	26FEB08	26FEB08																
TESTING AND ANALYSIS																							
AS33020502	33.02.05.02	0	Quarterly GW	2	2	31DEC07	02JAN08																
AS33020505	33.02.05.05	0	Disposal Characterization	177	177	31DEC07	08SEP08																
AS33021490	33.02.14.90	0	Independent Data Validation	177	177	31DEC07	08SEP08																
AS33021491	33.02.14.91	0	Data Evaluation & Management	177	177	31DEC07	08SEP08																
LIQUID COLLECTION																							
AS33090290	33.09.02.90	0	AFVR/DPE	130	130	27FEB08	28AUG08																
TRANSPORTATION AND DISPOSAL																							
AS33192290	33.19.22.90	0	Off-Site T&D	130	130	27FEB08	28AUG08																
DEMOBILIZATION																							
AS99210590	99.21.05.90	0	CCI Demobilization	1	1	29AUG08	29AUG08																
REPORTING																							
AS33210607	33.21.06.07	0	GW Sampling Report	170	170	27FEB08	24OCT08																
AS33210890	33.21.06.90	0	O&M Reports	170	170	27FEB08	24OCT08																

Start Date 30JAN04
 Finish Date 24OCT08
 Data Date 29DEC07
 Run Date 18JAN08 15:35



RAC4 - CO19 Sheet 1 of 1
CTO #0019 - Saufley - NAS Pensacola
CTO COMPLETION SCHEDULE
NAVY RAC SOUTHERN DIVISION



Appendix B

Health and Safety Plan

**Health and Safety Plan
Free Product Removal at UST 2406
Outlying Landing Field Saufley
Naval Air Station Pensacola
Pensacola, Florida**

Revision No. 00

**Contract No. N62467-01-D-0331
Contract Task Order No. 0019**

Submitted to:



**U.S. Naval Facilities
Engineering Command
Southeast**

Prepared by:



1000 Abernathy Road
Suite 1600
Atlanta, GA 30328

January 2008

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- 2 Project-Specific Chemical Product Hazard Communication Form
- 3 Chemical-Specific Training Form
- 4 Emergency Contacts
- 5 Project Activity Self-Assessment Checklists/Permits/Forms
- 6 Behavior Based Loss Prevention System Forms
- 7 Applicable Material Safety Data Sheets
- 8 Subcontractor H&S Plans/Procedures

Acronyms

°F	degrees Fahrenheit
AHA	Activity Hazard Analysis
ALARA	as low as reasonably achievable
APR	air-purifying respirator
ATL	Atlanta
BBLPS	Behavior Based Loss Prevention System
CH2M HILL	CH2M HILL Constructors, Inc.
CNS	central nervous system
CPR	cardiopulmonary resuscitation
CTO	Contract Task Order
dBA	decibel A-rated
DOT	Department of Transportation
FA	first aid
FID	flame ionization detector
GFCI	ground fault circuit interrupter
HAZCOM	hazard communication
HR	heart rate
HSM	Health and Safety Manager
HSP	Health and Safety Plan
IDLH	immediately dangerous to life and health
IDW	investigation-derived waste
IRF	Incident Report Form
lb	pound
LEL	lower explosive limit
LPO	Loss Prevention Observations
mg/m ³	milligrams per cubic meter
MSDS	Material Safety Data Sheet
mW/cm ²	milliwatt per square centimeter
NAVFAC EFD SOUTH	U.S. Navy Facilities Engineering Command, Southern Division
NDG	nuclear density gauge
NLI	Near Loss Investigation
NS	Naval Station
NSC	National Safety Council
NTR	Navy Technical Representative
OLF	Outlying Landing Field
OSHA	Occupational Safety and Health Administration
PAHs	polynuclear aromatic hydrocarbons
PAPR	powered air-purifying respirator
PDF	personal flotation device
PID	photoionization detector
PPE	personal protective equipment
ppm	parts per million
PTSP	Pre-Task Safety Plan

RMSF	Rocky Mountain Spotted Fever
SAR	supplied-air respirator
SCBA	self-contained breathing apparatus
SHSS	Site Health and Safety Specialist
SOP	standard of practice
STEL	short-term exposure limit
SZ	support zone
T&D	Transportation and disposal
TBD	to be determined
TMCC	truck-mounted crash cushion
TRPHs	total recoverable petroleum hydrocarbons
TSDF	treatment, storage, and disposal facility
UST	underground storage tank
VOCs	volatile organic compounds

This Health and Safety Plan (HSP) will be kept on the site during field activities and will be reviewed as necessary. The plan will be amended or revised as project activities or conditions change or when supplemental information becomes available. The plan adopts, by reference, the Standards of Practice (SOPs) in the CH2M HILL *Corporate Health and Safety Program, Program and Training Manual*, as appropriate. In addition, this plan adopts procedures in the project Work Plan. The Site Health and Safety Specialist (SHSS) will to be familiar with these SOPs and the contents of this plan. CH2M HILL Constructors Inc.'s (CH2M HILL) personnel and subcontractors must sign Attachment 1.

1.0 Project Information and Description

CONTRACT TASK ORDER (CTO) No: 0019

CLIENT: U.S. Navy Facilities Engineering Command Southeast (NAVFAC SE)

PROJECT/SITE NAME: Outlying Landing Field Saufley, Free Product Removal at UST 2406

SITE ADDRESS: Outlying Landing Field (OLF) Saufley, Naval Air Station (NAS) Pensacola

CH2M HILL PROJECT MANAGER: Greg Wilfley

CH2M HILL OFFICE: Atlanta, Georgia (ATL)

DATE HEALTH AND SAFETY PLAN PREPARED: January 2008

DATE(S) OF SITE WORK: Estimated February 2008-August 2008

SITE BACKGROUND AND SETTING: The scope of work that will be performed at Site 2406 will include planning and implementation of dual phase extraction of light non-aqueous phase liquid (free product) using aggressive fluid vapor recovery. This technology will operate for 7 months to remove free product at the site. In addition, three quarterly groundwater sampling events will be performed to evaluate system performance.

DESCRIPTION OF SPECIFIC TASKS TO BE PERFORMED: The activities associated with the scope of work are as follows:

- Mobilization and site preparation
- Active Product Recovery
- Product Thickness and Water Level Monitoring
- Waste Management
- Decontamination and Demobilization
- Site Restoration
- Quarterly Product Recovery and Groundwater Monitoring Report

2.0 Tasks to be Performed Under this Plan

Refer to project documents (i.e., Work Plan) for detailed task information. A health and safety risk analysis (Table 2-1) has been performed for each task and is incorporated in this plan through task-specific hazard controls and requirements for monitoring and protection. Tasks other than those listed below require an approved amendment or revision to this plan before tasks begin.

2.1 Hazwoper-Regulated Tasks

- Mobilization and Site Preparation
- Active Product Recovery
- Product and Water Level Monitoring
- Waste Management
- Decon and Demobilization
- Site Restoration

2.2 Non-Hazwoper-Regulated Tasks

Under specific circumstances, the training and medical monitoring requirements of federal or state Hazwoper regulations are not applicable. It must be demonstrated that the tasks can be performed without the possibility of exposure in order to use non-Hazwoper-trained personnel. **Prior approval from the Health and Safety Manager (HSM) is required before these tasks are conducted on regulated hazardous waste sites.**

Tasks	Controls
<ul style="list-style-type: none">• Preparation and Submittal Quarterly monitoring report	<ul style="list-style-type: none">• Brief on hazards, limits of access, and emergency procedures• Post contaminant areas as appropriate• Sample and monitor as appropriate

TABLE 2-1
Hazard Analysis
(Refer to Section 3 for hazard controls)

Potential Hazards	Project Activities							
	Mobilization and Site Setup	Installation of Temp. Recovery Wells	Active Product Recovery	Product Thickness and Waer Level Monitoring	Waste Management	Temporary Well Removal	Decon and Demobilization	Site Restoration
Manual Lifting (HS-29)	X		X		X		X	
Fire Prevention (HS-22)	X		X	X	X		X	
Electrical Safety (HS-23)								
Lockout /Tagout (HS-33)								
Ladders & Stairs(HS-25)								
Compressed Gas Cylinders (HS-63)								
Buried Utilities								
Excavations (HS-32)								
Fall Protection (HS-31)								
Heavy Equipment (HS-27)					X		X	
Confined Space Entry (HS-17)								
Concrete & Masonry Work (HS-43)								
Cranes and Hoisting (HS-44)								
Demolition (HS-45)								
Scaffolding(HS-73)								
Steel erection (HS-62)								
Welding and cutting (HS-22)								
Aerial Lifts (HS-41)								
Hand & Power Tools (HS-50)	X		X	X	X		X	
Forklifts (HS-48)								
Drilling (HS_35)								
Noise (HS-39)			X	X			X	
Pressurized Lines/Equipment							X	
Pressure Washing/Equip Decon							X	
Vacuum Truck/Pumping Operations			X					
Suspended Loads								
Vehicle Traffic								
Haul Truck Operations					X			
Visible Lighting			X	X	X		X	
Mechanical Guarding Hazards								
Asbestos Hazard								
Lead Hazard								
Chemical Hazard-Dermal/Inhalation			X	X	X		X	
Dust Hazard (Silica/Metals)								
Fire/Explosion Hazards			X					

3.0 Hazard Controls

This section provides safe work practices and control measures used to reduce or eliminate potential hazards. These practices and controls are to be implemented by the party in control of either the site or the particular hazard. CH2M HILL employees and subcontractors must remain aware of the hazards affecting them regardless of who is responsible for controlling the hazards. CH2M HILL employees and subcontractors who do not understand any of these provisions should contact the SHSS for clarification.

The health and safety hazards posed by field activities have been identified for each project activity and is provided in the Hazard Analysis Table (Table 2-1) in this section. Hazard control measures for project-specific and general H&S hazards are provided in 3.1 and 3.2 of this section.

Activity Hazard Analysis will be prepared before beginning each project activity posing H&S hazards to project personnel using the AHA form provided in the HSP Attachments as a guide. The AHA shall identify the work tasks required to perform each activity, along with potential H&S hazards and recommended control measures for each work task. In addition, a listing of the equipment to be used to perform the activity, inspection requirements and training requirements for the safe operation of the equipment listed must be identified. **AHAs shall be submitted to the Navy Technical Representative (NTR) for review at least 15 days prior to the start of each project activity phase.**

In addition to the controls specified in this section, Project-Activity Self-Assessment Checklists are contained in Attachment 5. These checklists are to be used to assess the adequacy of CH2M HILL and subcontractor site-specific safety requirements. The objective of the self-assessment process is to identify gaps in project safety performance, and prompt for corrective actions in addressing these gaps. Self-assessment checklists should be completed early in the project, when tasks or conditions change, or when otherwise specified by the HSM. The self-assessment checklists, including documented corrective actions, should be made part of the permanent project records.

Project-activity self-assessments checklist will be completed weekly by the SHSS during the course of the project, completing the applicable checklist depending on the work performed at the time on the project.

3.1 Project-Specific Hazards

3.1.1 Drum Handling

- Minimize manual handling and moving of drums and/or other waste containers whenever possible.
- Mechanical equipment should be utilized for moving drums whenever possible, appropriate drum grapplers, forklift with drum attachment, slings, etc. When not

feasible, manual drum handling equipment i.e. drum dollies, etc. may be used to minimize effort required for moving and lifting drums.

- Drums suspected of being pressurized require use of splash protection for workers when opening, this could consist of poly sheeting, splash or blast shield to deflect any spray and/or remote opening devices.
- Non-sparking tools should be used when opening drums containing potential flammable or combustible materials.
- Leaking, damaged, corroded, or otherwise deteriorated drums should be overpacked or contents transferred to another container prior to moving or handling.

3.1.2 Working around Material Handling Equipment

- Never approach operating equipment from the rear. Always make positive contact with the operator, and confirm that the operator has stopped the motion of the equipment.
- Never approach the side of operating equipment; remain outside of the swing and turning radius.
- Maintain distance from pinch points of operating equipment.
- Because heavy equipment may not be equipped with properly functioning reverse signal alarms, never turn your back on any operating equipment.
- Never climb onto operating equipment or operate contractor/subcontractor equipment.
- Never ride contractor/subcontractor equipment unless it is designed to accommodate passengers; equipped with firmly attached passenger seat.
- Never work or walk under a suspended load.
- Never use equipment as a personnel lift; do not ride excavator buckets or crane hooks.
- Always stay alert and maintain a safe distance from operating equipment, especially equipment on cross slopes and unstable terrain.

3.1.3 Operating Heavy Equipment

(Reference CH2M HILL, SOP HS-27, *Earthmoving Equipment*)

- CH2M HILL authorizes only those employees qualified by training or previous experience to operate material handling equipment.
- Equipment must be checked at the beginning of each shift to ensure the equipment is in safe operating condition and free of apparent damage. The check should include: service brakes, parking brakes, emergency brakes, tires, horn, back-up alarm, steering mechanism, coupling devices, seat belts and operating controls. All defects shall be corrected before the equipment is placed in service. Documentation of this inspection must be maintained onsite at all times.
- Equipment must be on a stable foundation such as solid ground or cribbing; outriggers are to be fully extended.

- Equipment must not be used to lift personnel; loads must not be lifted over the heads of personnel.
- Equipment, or parts thereof, which are suspended must be substantially blocked or cribbed to prevent shifting before personnel are permitted to work under or between them. All controls shall be in a neutral position, with the motors stopped and brakes set.
- Equipment which is operating in reverse must have a reverse signal alarm distinguishable from the surrounding noise or a signal person when the operators view is obstructed.
- When equipment is used near energized power lines, the closest part of the equipment must be at least 10 feet from the power lines < 50 kV. Provide an additional 4 feet for every 10 kV over 50 kV. A person must be designated to observe clearances and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means. All overhead power lines must be considered to be an energized until the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded.
- Underground utility lines must be located before excavation begins; refer to Section 3.2.11 "Procedures for Locating Buried Utilities."
- Operators loading/unloading from vehicles are responsible for seeing that vehicle drivers are in the vehicle cab or in a safe area.
- The parking brake shall be set whenever equipment is parked, wheels must be chocked when parked on inclines.
- When not in operation, the blade/bucket must be blocked or grounded; the master clutch must be disengaged when the operator leaves the cab. When equipment is unattended, power must be shut off, brakes set, blades/buckets landed and shift lever in neutral.
- Ladders, stairways or integral prefabricated scaffold ladders must be used to access the platform; scaffold crossbracing may not be used as a means of access.
- CH2M HILL personnel must have completed CH2M HILL's fall protection training when personal fall arrest systems (harness, lanyard, lnelines, etc.) are required to be used on scaffolding.
- Personnel working from suspended scaffolding are required to wear a full body harness with lanyard attached to an independent lifeline.

3.1.4 Vacuum Truck Operations

Vacuum truck operations on this project will involve removal of petroleum products and contaminated groundwater from recovery wells installed at the site. This activity may result in flammable and/or toxic atmospheric conditions in lines, inside vacuum tank or vessels and at the vacuum exhaust of the truck. Hoses and tanks should be grounded and bonded to dissipate static electricity generated from the transfer of material. In addition, the

area around and downwind of the vacuum exhaust should be monitored for conditions while performing the fluid recovery operations.

- Only qualified and authorized persons will be allowed to operate vacuum truck equipment.
- Vacuum truck shall be operated in an area free from overhead obstructions. Proper distances shall be maintained from overhead obstructions, power lines, etc.
- Vacuum truck shall be set located on a firm and level surface that will provide adequate support and work area around vehicle. Brakes to be set and wheels chocked.
- Inspect all hoses, fittings, and equipment to be used for compatibility and condition prior to transferring liquids.
- Vacuum hoses and equipment shall be set up to minimize trip hazards and shall be secured to minimize movement during operation.
- Personnel working with vacuum hoses shall keep hands and feet clear of ends of hoses at all times.
- Vacuum hoses shall not be left unattended with vacuum engaged.
- Secure all quick connect fittings prior to beginning transfer.
- Verify that both vessel to be emptied and the receiving vessel are prepared (valves/vents open, room in tank, etc) prior to beginning transfer.
- Verify that appropriate grounding and bonding of hoses, connections and tanks/vessels is in place prior to pumping flammable or combustible materials.
- Ensure that all materials have cleared the vacuum line and pressure/vacuum is relieved prior to breaking connections upon completion of transfer.

3.1.5 Exposure to Public Vehicular Traffic

The following precautions must be taken when working around traffic, and in or near an area where traffic controls have been established by a contractor.

- Exercise caution when exiting traveled way or parking along street – avoid sudden stops, use flashers, etc.
- Park in a manner that will allow for safe exit from vehicle, and where practicable, park vehicle so that it can serve as a barrier.
- All staff working adjacent to traveled way or within work area must wear reflective/high-visibility safety vests.
- Eye protection should be worn to protect from flying debris.
- Remain aware of factors that influence traffic related hazards and required controls – sun glare, rain, wind, flash flooding, limited sight-distance, hills, curves, guardrails, width of shoulder (i.e., breakdown lane), etc.

- Always remain aware of an escape route – behind an established barrier, parked vehicle, guardrail, etc.
- Always pay attention to moving traffic – never assume drivers are looking out for you
- Work as far from traveled way as possible to avoid creating confusion for drivers.
- When workers must face away from traffic, a “buddy system” should be used, where one worker is looking towards traffic.
- When working on highway projects, obtain a copy of the contractor’s traffic control plan.
- Work area should be protected by a physical barrier – such as a K-rail or Jersey barrier.
- Review traffic control devices to ensure that they are adequate to protect your work area. Traffic control devices should: 1) convey a clear meaning, 2) command respect of road users, and 3) give adequate time for proper traffic response. The adequacy of these devices are dependent on limited sight distance, proximity to ramps or intersections, restrictive width, duration of job, and traffic volume, speed, and proximity.
- Either a barrier or shadow vehicle should be positioned a considerable distance ahead of the work area. The vehicle should be equipped with a flashing arrow sign and truck-mounted crash cushion (TMCC). All vehicles within 40 feet of traffic should have an orange flashing hazard light atop the vehicle.
- Except on highways, flaggers should be used when 1) two-way traffic is reduced to using one common lane, 2) driver visibility is impaired or limited, 3) project vehicles enter or exit traffic in an unexpected manner, or 4) the use of a flagger enhances established traffic warning systems.
- Lookouts should be used when physical barriers are not available or practical. The lookout continually watches approaching traffic for signs of erratic driver behavior and warns workers. Vehicles should be parked at least 40 feet away from the work zone and traffic. Minimize the amount of time that you will have your back to oncoming traffic.

3.2 General Hazards

3.2.1 General Practices and Housekeeping

(Reference CH2M HILL- SOP HS-20, *General Practices*)

- Site work should be performed during daylight hours whenever possible. Work conducted during hours of darkness require enough illumination intensity to read a newspaper without difficulty.
- Good housekeeping must be maintained at all times in all project work areas.
- Common paths of travel should be established and kept free from the accumulation of materials.

- Keep access to aisles, exits, ladders, stairways, scaffolding, and emergency equipment free from obstructions.
- Provide slip-resistant surfaces, ropes, and/or other devices to be used.
- Specific areas should be designated for the proper storage of materials.
- Tools, equipment, materials, and supplies shall be stored in an orderly manner.
- As work progresses, scrap and unessential materials must be neatly stored or removed from the work area.
- Containers should be provided for collecting trash and other debris and shall be removed at regular intervals.
- All spills shall be quickly cleaned up. Oil and grease shall be cleaned from walking and working surfaces.

3.2.2 Hazard Communication

(Reference CH2M HILL-SOP HS-05, *Hazard Communication*)

The SHSS is to perform the following:

- Complete an inventory of chemicals brought on site by CH2M HILL using Attachment 2.
- Confirm that an inventory of chemicals brought on site by CH2M HILL subcontractors is available.
- Request or confirm locations of Material Safety Data Sheets (MSDSs) from the client, contractors, and subcontractors for chemicals to which CH2M HILL employees potentially are exposed.
- Before or as the chemicals arrive on site, obtain an MSDS for each hazardous chemical.
- Label chemical containers with the identity of the chemical and with hazard warnings, and store properly.
- Give employees required chemical-specific HAZCOM training using Attachment 3.
- Store all materials properly, giving consideration to compatibility, quantity limits, secondary containment, fire prevention, and environmental conditions.

3.2.3 Shipping and Transportation of Chemical Products

(Reference CH2M HILL's *Procedures for Shipping and Transporting Dangerous Goods*)

Chemicals brought to the site might be defined as hazardous materials by the U.S. Department of Transportation (DOT). All staff who ship the materials or transport them by road must receive CH2M HILL training in shipping dangerous goods. All hazardous materials that are shipped (e.g., via Federal Express) or are transported by road must be properly identified, labeled, packed, and documented by trained staff. Contact the HSM or the Equipment Coordinator for additional information.

3.2.4 Lifting

(Reference CH2M HILL-SOP HS-29, *Lifting*)

- Proper lifting techniques must be used when lifting any object.
- Plan storage and staging to minimize lifting or carrying distances.
- Split heavy loads into smaller loads.
- Use mechanical lifting aids whenever possible.
- Have someone assist with the lift -- especially for heavy or awkward loads.
- Make sure the path of travel is clear prior to the lift.

3.2.5 Fire Prevention

(Reference CH2M HILL- SOP HS-22, *Fire Prevention*)

- Fire extinguishers shall be provided so that the travel distance from any work area to the nearest extinguisher is less than 100 feet. When 5 gallons or more of a flammable or combustible liquid is being used, an extinguisher must be within 50 feet. Extinguishers must:
 - be maintained in a fully charged and operable condition,
 - be visually inspected each month, and
 - undergo a maintenance check each year.
- The area in front of extinguishers must be kept clear.
- Post "Exit" signs over exiting doors, and post "Fire Extinguisher" signs over extinguisher locations.
- Combustible materials stored outside should be at least 10 feet from any building.
- Solvent waste and oily rags must be kept in a fire resistant, covered container until removed from the site.
- Flammable/combustible liquids must be kept in approved containers, and must be stored in an approved storage cabinet.

3.2.6 Electrical

(Reference CH2M HILL-SOP HS-23, *Electrical*)

- Only qualified personnel are permitted to work on unprotected energized electrical systems.
- Only authorized personnel are permitted to enter high-voltage areas.
- Do not tamper with electrical wiring and equipment unless qualified to do so. All electrical wiring and equipment must be considered energized until lockout/tagout procedures are implemented.
- Inspect electrical equipment, power tools, and extension cords for damage prior to use. Do not use defective electrical equipment, remove from service.
- All temporary wiring, including extension cords and electrical power tools, must have ground fault circuit interrupters (GFCIs) installed.

- Extension cords must be:
 - equipped with third-wire grounding.
 - covered, elevated, or protected from damage when passing through work areas.
 - protected from pinching if routed through doorways.
 - not fastened with staples, hung from nails, or suspended with wire.
- Electrical power tools and equipment must be effectively grounded or double-insulated UL approved.
- Operate and maintain electric power tools and equipment according to manufacturers' instructions.
- Maintain safe clearance distances between overhead power lines and any electrical conducting material unless the power lines have been de-energized and grounded, or where insulating barriers have been installed to prevent physical contact. Maintain at least 10 feet from overhead power lines for voltages of 50 kV or less, and 10 feet plus ½ inch for every 1 kV over 50 kV.
- Temporary lights shall not be suspended by their electric cord unless designed for suspension. Lights shall be protected from accidental contact or breakage.
- Protect all electrical equipment, tools, switches, and outlets from environmental elements.

3.2.7 Stairways and Ladders

(Reference CH2M HILL-SOP HS-25, *Stairways and Ladders*)

- Stairway or ladder is generally required when a break in elevation of 19 inches or greater exists.
- Personnel should avoid using both hands to carry objects while on stairways; if unavoidable, use extra precautions.
- Personnel must not use pan and skeleton metal stairs until permanent or temporary treads and landings are provided the full width and depth of each step and landing.
- Ladders must be inspected by a competent person for visible defects prior to each day's use. Defective ladders must be tagged and removed from service.
- Ladders must be used only for the purpose for which they were designed and shall not be loaded beyond their rated capacity.
- Only one person at a time shall climb on or work from an individual ladder.
- User must face the ladder when climbing; keep belt buckle between side rails
- Ladders shall not be moved, shifted, or extended while in use.
- User must use both hands to climb; use rope to raise and lower equipment and materials
- Straight and extension ladders must be tied off to prevent displacement

- Ladders that may be displaced by work activities or traffic must be secured or barricaded
- Portable ladders must extend at least 3 feet above landing surface
- Straight and extension ladders must be positioned at such an angle that the ladder base to the wall is one-fourth of the working length of the ladder
- Stepladders are to be used in the fully opened and locked position
- Users are not to stand on the top two steps of a stepladder; nor are users to sit on top or straddle a stepladder
- Fixed ladders > 24 feet in height must be provided with fall protection devices.
- Fall protection should be considered when working from extension, straight, or fixed ladders greater than 6 feet from lower levels and both hands are needed to perform the work, or when reaching or working outside of the plane of ladder side rails.

3.2.8 Heat Stress

(Reference CH2M HILL- SOP HS-09, *Heat and Cold Stress*)

- Drink 16 ounces of water before beginning work. Disposable cups and water maintained at 50oF to 60oF should be available. Under severe conditions, drink one to two cups every 20 minutes, for a total of 1 to 2 gallons per day. Do not use alcohol in place of water or other nonalcoholic fluids. Decrease your intake of coffee and caffeinated soft drinks during working hours.
- Acclimate yourself by slowly increasing workloads (e.g., do not begin with extremely demanding activities).
- Use cooling devices, such as cooling vests, to aid natural body ventilation. These devices add weight, so their use should be balanced against efficiency.
- Use mobile showers or hose-down facilities to reduce body temperature and cool protective clothing.
- Conduct field activities in the early morning or evening and rotate shifts of workers, if possible.
- Avoid direct sun whenever possible, which can decrease physical efficiency and increase the probability of heat stress. Take regular breaks in a cool, shaded area. Use a wide-brim hat or an umbrella when working under direct sun for extended periods.
- Provide adequate shelter/shade to protect personnel against radiant heat (sun, flames, hot metal).
- Maintain good hygiene standards by frequently changing clothing and showering.
- Observe one another for signs of heat stress. Persons who experience signs of heat syncope, heat rash, or heat cramps should consult the SHSS to avoid progression of heat-related illness.

Symptoms and Treatment of Heat Stress					
	Heat Syncope	Heat Rash	Heat Cramps	Heat Exhaustion	Heat Stroke
Signs and Symptoms	Sluggishness or fainting while standing erect or immobile in heat.	Profuse tiny raised red blister-like vesicles on affected areas, along with prickling sensations during heat exposure.	Painful spasms in muscles used during work (arms, legs, or abdomen); onset during or after work hours.	Fatigue, nausea, headache, giddiness; skin clammy and moist; complexion pale, muddy, or flushed; may faint on standing; rapid thready pulse and low blood pressure; oral temperature normal or low	Red, hot, dry skin; dizziness; confusion; rapid breathing and pulse; high oral temperature.
Treatment	Remove to cooler area. Rest lying down. Increase fluid intake. Recovery usually is prompt and complete.	Use mild drying lotions and powders, and keep skin clean for drying skin and preventing infection.	Remove to cooler area. Rest lying down. Increase fluid intake.	Remove to cooler area. Rest lying down, with head in low position. Administer fluids by mouth. Seek medical attention.	Cool rapidly by soaking in cool—but not cold—water. Call ambulance, and get medical attention immediately!

3.2.8.1 Monitoring Heat Stress

These procedures should be considered when the ambient air temperature exceeds 70°F, the relative humidity is high (>50 percent), or when workers exhibit symptoms of heat stress. The heart rate (HR) should be measured by the radial pulse for 30 seconds, as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 100 beats/minute, or 20 beats/minute above resting pulse. If the HR is higher, the next work period should be shortened by 33 percent, while the length of the rest period stays the same. If the pulse rate still exceeds 100 beats/minute at the beginning of the next rest period, the work cycle should be further shortened by 33 percent. The procedure is continued until the rate is maintained below 100 beats/minute, or 20 beats/minute above resting pulse.

3.2.9 Cold Stress

(Reference CH2M HILL- SOP HS-09, *Heat and Cold Stress*)

- Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate rain gear is a must in cool weather.
- Consider monitoring the work conditions and adjusting the work schedule using guidelines developed by the U.S. Army (wind-chill index) and the National Safety Council (NSC).
- Wind-Chill Index is used to estimate the combined effect of wind and low air temperatures on exposed skin. The wind-chill index does not take into account the body part that is exposed, the level of activity, or the amount or type of clothing worn. For those reasons, it should only be used as a guideline to warn workers when they are in a situation that can cause cold-related illnesses.
- NSC Guidelines for Work and Warm-Up Schedules can be used with the wind-chill index to estimate work and warm-up schedules for fieldwork. The guidelines are not

absolute; workers should be monitored for symptoms of cold-related illnesses. If symptoms are not observed, the work duration can be increased.

- Persons who experience initial signs of immersion foot, frostbite, hypothermia should consult the SHSS to avoid progression of cold-related illness.
- Observe one another for initial signs of cold-related disorders.
- Obtain and review weather forecast – be aware of predicted weather systems along with sudden drops in temperature, increase in winds, and precipitation.

Symptoms and Treatment of Cold Stress			
	Immersion (Trench) Foot	Frostbite	Hypothermia
Signs and Symptoms	Feet discolored and painful; infection and swelling present.	Blanched, white, waxy skin, but tissue resilient; tissue cold and pale.	Shivering, apathy, sleepiness; rapid drop in body temperature; glassy stare; slow pulse; slow respiration.
Treatment	Seek medical treatment immediately.	Remove victim to a warm place. Re-warm area quickly in warm—but not hot-water. Have victim drink warm fluids, but not coffee or alcohol. Do not break blisters. Elevate the injured area, and get medical attention.	Remove victim to a warm place. Have victim drink warm fluids, but not coffee or alcohol. Get medical attention.

3.3 Biological Hazards and Controls

3.3.1 Snakes

Snakes typically are found in underbrush and tall grassy areas. If you encounter a snake, stay calm and look around; there may be other snakes. Turn around and walk away on the same path you used to approach the area. If a person is bitten by a snake, wash and immobilize the injured area, keeping it lower than the heart if possible. Seek medical attention immediately. **DO NOT** apply ice, cut the wound, or apply a tourniquet. Try to identify the type of snake: note color, size, patterns, and markings.

3.3.2 Poison Ivy and Poison Sumac

Poison ivy, poison oak, and poison sumac typically are found in brush or wooded areas. They are more commonly found in moist areas or along the edges of wooded areas. Become familiar with the identity of these plants. Wear protective clothing that covers exposed skin and clothes. Avoid contact with plants and the outside of protective clothing. If skin contacts a plant, wash the area with soap and water immediately. If the reaction is severe or worsens, seek medical attention.

3.3.3 Ticks

Ticks typically are in wooded areas, bushes, tall grass, and brush. Ticks are black, black and red, or brown and can be up to one-quarter inch in size. Wear tightly woven light-colored clothing with long sleeves and pant legs tucked into boots; spray **only outside** of clothing

with permethrin or permethrin and spray skin with only DEET; and check yourself frequently for ticks.

If bitten by a tick, grasp it at the point of attachment and carefully remove it. After removing the tick, wash your hands and disinfect and press the bite areas. Save the removed tick. Report the bite to human resources. Look for symptoms of Lyme disease or Rocky Mountain spotted fever (RMSF). Lyme: a rash might appear that looks like a bullseye with a small welt in the center. RMSF: a rash of red spots under the skin 3 to 10 days after the tick bite. In both cases, chills, fever, headache, fatigue, stiff neck, and bone pain may develop. If symptoms appear, seek medical attention.

3.3.4 Bees and Other Stinging Insects

Bee and other stinging insects may be encountered almost anywhere and may present a serious hazard, particularly to people who are allergic. Watch for and avoid nests. Keep exposed skin to a minimum. Carry a kit if you have had allergic reactions in the past, and inform the SHSS and/or buddy. If a stinger is present, remove it carefully with tweezers. Wash and disinfect the wound, cover it, and apply ice. Watch for allergic reaction; seek medical attention if a reaction develops.

3.3.5 Bloodborne Pathogens

(Reference CH2M HILL- SOP HS-36, *Bloodborne Pathogens*)

Exposure to bloodborne pathogens may occur when rendering first aid or CPR, or when coming into contact with landfill waste or waste streams containing potentially infectious material. Exposure controls and personal protective equipment (PPE) are required as specified in CH2M HILL SOP HS-36, *Bloodborne Pathogens*. Hepatitis B vaccination must be offered before the person participates in a task where exposure is a possibility.

3.3.6 Mosquito Bites

Due to the recent detection of the West Nile Virus in the Southeastern United States, it is recommended that **preventative measures** be taken to reduce the probability of being bitten by mosquitoes whenever possible. Mosquitoes are believed to be the primary source for exposure to the West Nile Virus as well as several other types of encephalitis. The following guidelines should be followed to reduce the risk of these concerns for working in areas where mosquitoes are prevalent:

- Stay indoors at dawn, dusk, and in the early evening.
- Wear long-sleeved shirts and long pants whenever you are outdoors.
- Spray clothing with repellents containing permethrin or DEET since mosquitoes may bite through thin clothing.
- Apply insect repellent sparingly to exposed skin. An effective repellent will contain 35 percent DEET (N,N-diethyl-meta-toluamide). DEET in high concentrations (greater than 35 percent) provides no additional protection.
- Repellents may irritate the eyes and mouth, so avoid applying repellent to the hands.

- Whenever you use an insecticide or insect repellent, be sure to read and follow the manufacturer's DIRECTIONS FOR USE, as printed on the product.

Note: Vitamin B and "ultrasonic" devices are NOT effective in preventing mosquito bites.

3.3.6.1 Symptoms of Exposure to the West Nile Virus

- Most infections are mild, and symptoms include fever, headache, and body aches, occasionally with skin rash and swollen lymph glands. More severe infection may be marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis, and, rarely, death.
- The West Nile Virus incubation period is from 3-15 days.
- If you have any questions or to report any suspicious symptoms, contact the project Health and Safety Manager.

3.4 Radiological Hazards and Controls

Refer to CH2M HILL's Corporate Health and Safety Program, Program and Training Manual, and Corporate Health and Safety Program, Radiation Protection Program Manual, for standards of practice in contaminated areas.

3.5 Contaminants of Concern

Contaminants of Concern are listed in Table 3-1.

TABLE 3-1
Contaminants of Concern

Contaminant	Location and Maximum ^a Concentration (ppm)	Exposure Limit ^b	IDLH ^c	Symptoms and Effects of Exposure	PIP ^d (eV)
Benzene	Unknown	1 ppm	500 Ca	Eye, nose, skin, and respiratory irritation; headache; nausea; dermatitis; fatigue; giddiness; staggered gait; bone marrow depression	
Ethyl Benzene	Unknown	100 ppm	800	Eye, skin, and mucous membrane irritation; headache; dermatitis; narcotic; coma	
TRPH	SB: 340 mg/kg	100 mg/m ³	1000	Eye, skin, and nose irritation; headache; dizziness; vomiting; dermatitis, burning sensation, in chest, weakness, chemical pneumonia	UK
Toluene	Unknown	50 ppm	500	Eye and nose irritation, fatigue, weakness, confusion, dizziness, headache, dilated pupils, excessive tearing, nervousness, muscle fatigue, paresthesia, dermatitis, liver and kidney damage	8.82

TABLE 3-1
Contaminants of Concern

Contaminant	Location and Maximum ^a Concentration (ppm)	Exposure Limit ^b	IDLH ^c	Symptoms and Effects of Exposure	PIP ^d (eV)
Xylenes	Unknown	100 ppm	900	Irritated eyes, skin, nose, and throat; dizziness; excitement; drowsiness; incoherence; staggering gait; corneal vacuolization; anorexia; nausea; vomiting; abdominal pain; dermatitis	8.56
Footnotes: ^a Specify sample-designation and media: SB (Soil Boring). ^b Appropriate value of PEL, REL, or TLV listed. ^c IDLH = immediately dangerous to life and health (units are the same as specified "Exposure Limit" units for that contaminant); NL = No limit found in reference materials; CA = Potential occupational carcinogen. ^d PIP = photoionization potential; NA = Not applicable; UK = Unknown.					

3.6 Potential Routes of Exposure

Dermal: Contact with contaminated media. This route of exposure is minimized through proper use of PPE, as specified in Section 4.

Inhalation: Vapors and contaminated particulates. This route of exposure is minimized through proper respiratory protection and monitoring, as specified in Sections 4 and 5, respectively.

Other: Inadvertent ingestion of contaminated media. This route should not present a concern if good hygiene practices are followed (e.g., wash hands and face before drinking or smoking).

4.0 Project Organization and Personnel

4.1 CH2M HILL Employee Medical Surveillance and Training

(Reference CH2M HILL- SOPs HS-01, *Medical Surveillance*, and HS-02, *Health and Safety Training*)

The employees listed meet state and federal hazardous waste operations requirements for 40-hour initial training, 3-day on-the-job experience, and 8-hour annual refresher training. Employees designated "SHSS" have completed a 12-hour site safety coordinator course, and have documented requisite field experience. An SHSS with a level designation (D, C, B) equal to or greater than the level of protection being used must be present during all tasks performed in exclusion or decontamination zones. Employees designated "FA-CPR" are currently certified by the American Red Cross, or equivalent, in first aid and CPR. At least one FA-CPR designated employee must be present during all tasks performed in exclusion or decontamination zones. At least two FA-CPR trained employees must be available at each job site/operation. The employees listed below are currently active in a medical surveillance program that meets state and federal regulatory requirements for hazardous waste operations. Certain tasks (e.g., confined-space entry) and contaminants (e.g., lead) may require additional training and medical monitoring.

Pregnant employees are to be informed of and are to follow the procedures in CH2M HILL-SOP HS-04, *Reproduction Protection*, including obtaining a physician's statement of the employee's ability to perform hazardous activities before being assigned fieldwork.

Employee Name	Office	Responsibility	SHSS/FA-CPR
Richard Rathnow	KNV	Health & Safety Manager	Level C/FA-CPR
Greg Wilfley	ATL	Project Manager	Level C SHSS/FA-CPR
TBD	TBD	Project Super./SHSS	Level C SHSS/FA-CPR

4.2 Field Team Chain of Command and Communication Procedures

4.2.1 Client

Contact Name: William Gate/NAVFAC SE Remedial Project Manager

4.2.2 CH2M HILL

Program Manager: Sid Allison

Project Manager: Greg Wilfley

Health and Safety Manager: Richard Rathnow

Field Team Leader: TBD

Site Health and Safety Specialist: TBD

The CH2M HILL project manager (PM) is responsible for providing adequate resources (budget and staff) for project-specific implementation of the HS&E management process. The PM has overall management responsibility for the tasks listed below. The PM may explicitly delegate specific tasks to other staff, as described in sections that follow, but retains ultimate responsibility for completion of the following in accordance with this SOP:

- Include standard terms and conditions, and contract-specific HS&E roles and responsibilities in contract and subcontract agreements (including flow-down requirements to lower-tier subcontractors)
- Select safe and competent subcontractors by:
 - obtaining, reviewing and accepting or rejecting subcontractor pre-qualification questionnaires
 - ensuring that acceptable certificates of insurance, including CH2M HILL as named additional insured, are secured as a condition of subcontract award
 - including HS&E submittals checklist in subcontract agreements, and ensuring that appropriate site-specific safety procedures, training and medical monitoring records are reviewed and accepted prior to the start of subcontractor's field operations
- Maintain copies of subcontracts and subcontractor certificates of insurance (including CH2M HILL as named additional insured), bond, contractors license, training and medical monitoring records, and site-specific safety procedures in the project file accessible to site personnel
- Provide oversight of subcontractor HS&E practices per the site-specific safety plan
- Manage the site and interfacing with 3rd parties in a manner consistent with our contract and subcontract agreements and the applicable standard of reasonable care
- Ensure that the overall, job-specific, HS&E goals are fully and continuously implemented

The CH2M HILL HSM is responsible for:

- Review and accept or reject subcontractor pre-qualification questionnaires that fall outside the performance range delegated to the Contracts Administrator (KA)
- Review and accept or reject subcontractor training records and site-specific safety procedures prior to start of subcontractor's field operations
- Support the SHSS's oversight of subcontractor (and lower-tier subcontractors) HS&E practices and interfaces with on-site 3rd parties per the site-specific safety plan
- The SHSS is responsible for verifying that the project is conducted in a safe manner including the following specific obligations:

- Verify this HSP remains current and amended when project activities or conditions change
- Verify CH2M HILL site personnel and subcontractor personnel read this HSP and sign Attachment 1 “Employee Signoff Form” prior to commencing field activities
- Verify CH2M HILL site personnel and subcontractor personnel have completed any required specialty training (e.g., fall protection, confined space entry) and medical surveillance as identified in Section 2
- Verify compliance with the requirements of this HSP and applicable subcontractor health and safety plan(s)
- Act as the project “Hazard Communication Coordinator” and perform the responsibilities outlined in Section 2.2.2
- Act as the project “Emergency Response Coordinator” and perform the responsibilities outlined in Section 4
- Post OSHA job-site poster; the poster is required at sites where project field offices, trailers, or equipment-storage boxes are established; posters can be obtained by calling 800/548-4776 or 800/999-9111
- Verify that safety meetings are conducted and documented in the project file initially and as needed throughout the course of the project (e.g., as tasks or hazards change)
- Verify that project H&S forms and permits, found in Attachment 5, are being used as outlined in Section 2
- Perform oversight and/or assessments of subcontractor HS&E practices per the site-specific safety plan and verify that project activity self-assessment checklists, found in Attachment 5, are being used as outlined in Section 2
- Verify that project files available to site personnel include copies of executed subcontracts and subcontractor certificates of insurance (including CH2M HILL as named additional insured), bond, contractors license, training and medical monitoring records, and site-specific safety procedures prior to start of subcontractor’s field operations
- Manage the site and interfacing with 3rd parties in a manner consistent with our contract/subcontract agreements and the applicable standard of reasonable care
- Coordinate with the HS&E manager regarding CH2M HILL and subcontractor operational performance, and 3rd party interfaces
- Ensure that the overall, job-specific, HS&E goals are fully and continuously implemented
- The training required for the SHSS is as follows:
 - SHSS 10 hour course
 - OSHA 10 hour course for Construction

- First Aid and CPR
- Relevant Competent Person Courses (excavation, confined space, scaffold, fall protection, etc.)

The SHSS is responsible for contacting the Field Team Leader and Project Manager. In general, the Project Manager will contact the client. The Health and Safety Manager should be contacted as appropriate.

4.2.3 Subcontractors

(Reference CH2M HILL- SOP HS-55, *Subcontractor, Contractor, and Owner*)

Certain subcontractors (drilling, remedial and construction contractors) are required to be pre-qualified for safety by completing the Subcontractor Safety Performance Questionnaire. The subcontractors listed above are covered by this HSP. However, this plan does not address hazards associated with the tasks and equipment that the subcontractor has expertise in (e.g., drilling, excavation work, electrical). Subcontractors are responsible for the health and safety procedures specific to their work, and are required to submit these procedures to CH2M HILL for review before the start of field work by following the Subcontractor Safety Procedure Criteria specific to their work.

Subcontractors are also required to prepare Activity Hazard Analysis before beginning each activity posing H&S hazards to their personnel using the AHA form provided in Attachment 6 as a guide. The AHA shall identify the principle steps of the activity, potential H&S hazards for each step and recommended control measures for each identified hazard. In addition, a listing of the equipment to be used to perform the activity, inspection requirements and training requirements for the safe operation of the equipment listed must be identified.

Subcontractors must comply with the established health and safety plan(s). The CH2M HILL SHSS should verify that subcontractor employee training, medical clearance, and fit test records are current and must monitor and enforce compliance with the established plan(s). CH2M HILL oversight does not relieve subcontractors of their responsibility for effective implementation and compliance with the established plan(s).

CH2M HILL should continuously endeavor to observe subcontractors' safety performance. This endeavor should be reasonable, and include observing for hazards or unsafe practices that are both readily observable and occur in common work areas. CH2M HILL is not responsible for exhaustive observation for hazards and unsafe practices. In addition to this level of observation, the SHSS is responsible for confirming CH2M HILL subcontractor performance against both the subcontractor's safety plan and applicable self-assessment checklists. Self-assessment checklists contained in Attachment 5 are to be used by the SHSS to review subcontractor performance.

Health and safety related communications with CH2M HILL subcontractors should be conducted as follows:

- Brief subcontractors on the provisions of this plan, and require them to sign the Employee Signoff Form included in Attachment 1.

- Request subcontractor(s) to brief project team on the hazards and precautions related to their work.
- When apparent non-compliance/unsafe conditions or practices are observed, notify the subcontractor safety representative and require corrective action – the subcontractor is responsible for determining and implementing necessary controls and corrective actions.
- When repeat non-compliance/unsafe conditions are observed, notify the subcontractor safety representative and stop affected work until adequate corrective measures are implemented.
- When an apparent imminent danger exists, immediately remove all affected CH2M HILL employees and subcontractors, notify subcontractor safety representative, and stop affected work until adequate corrective measures are implemented. Notify the Project Manager and HSM as appropriate.
- Document all oral health and safety related communications in project field logbook, daily reports, or other records.

5.0 Personal Protective Equipment

(Reference CH2M HILL- SOP HS-07, *Personal Protective Equipment*, HS-08, *Respiratory Protection*)

PPE Specifications are listed in Table 5-1.

TABLE 5-1
PPE Specifications^a

Task	Level	Body	Head	Respirator ^b
<ul style="list-style-type: none"> General site entry Mobilization & Site Setup Site Restoration 	D	Work clothes; steel-toe, leather work boots; work glove.	Hardhat ^c Safety glasses Ear protection ^d	None required
<ul style="list-style-type: none"> Well Installation AFVR Product/Groundwater Monitoring Equipment Decon Sampling and Analyses Temp. Well Removal 	Modified D	Work clothes and/or Tyvek Coveralls as needed Boots: Steel-toe, chemical-resistant boots OR steel-toe, leather work boots with outer rubber boot covers Gloves: Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat ^c Safety glasses Ear protection ^d Splash Protection as required	None required
Tasks requiring upgrade	C	Coveralls: Polycoated Tyvek® Boots: Steel-toe, chemical-resistant boots OR steel-toe, leather work boots with outer rubber boot covers Gloves: Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat ^c Splash shield ^c Ear protection ^d Spectacle inserts	APR, full face, MSA Ultratwin or equivalent; with GME-H cartridges or equivalent ^e .
Tasks requiring upgrade	B	Coveralls: Polycoated Tyvek® Boots: Steel-toe, chemical-resistant boots OR steel-toe, leather work boots with outer rubber boot covers Gloves: Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat ^c Splash shield ^c Ear protection ^d Spectacle inserts	Positive-pressure demand self-contained breathing apparatus (SCBA); MSA Ultralite, or equivalent.

Reasons for Upgrading or Downgrading Level of Protection

Upgrade ^f	Downgrade
<ul style="list-style-type: none"> Request from individual performing tasks. Change in work tasks that will increase contact or potential contact with hazardous materials. Occurrence or likely occurrence of gas or vapor emission. Known or suspected presence of dermal hazards. Instrument action levels (Section 5) exceeded. 	<ul style="list-style-type: none"> New information indicating that situation is less hazardous than originally thought. Change in site conditions that decreases the hazard. Change in work task that will reduce contact with hazardous materials.

^a Modifications are as indicated. CH2M HILL will provide PPE only to CH2M HILL employees.

^b No facial hair that would interfere with respirator fit is permitted.

^c Hardhat and splash-shield areas are to be determined by the SHSS.

^d Ear protection should be worn when conversations cannot be held at distances of 3 feet or less without shouting.

^e Cartridge change-out schedule is at least every 8 hours (or one work day), except if relative humidity is > 85%, or if organic vapor measurements are > midpoint of Level C range (refer to Section 5)--then at least every 4 hours. If encountered conditions are different than those anticipated in this HSP, contact the HSM.

^f Performing a task that requires an upgrade to a higher level of protection (e.g., Level D to Level C) is permitted only when the PPE requirements have been approved by the HSM, and an SHSS qualified at that level is present.

6.0 Air Monitoring/Sampling

(Reference CH2M HILL- SOP HS-06, *Air Monitoring*)

6.1 Air Monitoring Specifications

Air Monitoring Specifications are listed in Table 6-1.

TABLE 6-1
Air Monitoring Specifications

Instrument	Tasks	Action Levels ^a		Frequency ^b	Calibration
PID: OVM with 10.6eV lamp or equivalent	AFVR	Up to 1ppm	Level D	Initially and periodically during task	Daily
		1-5 ppm	Level D; collect benzene tube; benzene action level not exceeded		
		5-25 ppm	Level C or allow vapors to dissipate to <5ppm; collect benzene tube; benzene action level not exceeded		
		> 25 ppm	Level B: Contact HSM		
CGI: MSA model 260 or 261 or equivalent	AFVR	0-10% : 10-25% LEL: >25% LEL:	No explosion hazard Potential explosion hazard Explosion hazard; evacuate or vent	Continuous during advancement of boring or trench	Daily
O₂Meter: MSA model 260 or 261 or equivalent	AFVR	>25% ^c O ₂ : 20.9% ^c O ₂ : <19.5% ^c O ₂ :	Explosion hazard; evacuate or vent Normal O ₂ O ₂ deficient; vent or use SCBA	Continuous during advancement of boring or trench	Daily
Dust Monitor Visual Assessment	All activities	No Visible Dust	Level D	Initially and periodically during tasks	Zero Daily
		Visible Dust	Use dust suppression methods		
Detector Tube: Drager benzene specific 0.5/c (0.5 to 10 ppm range) with pre-tube, or equivalent	AFVR	<0.5 ppm 0.5-1 ppm >1 ppm	Level D Level C Level B	Initially and periodically when PID/FIB >1 ppm	Not applicable
Nose-Level Monitor^e:	AFVR	<85 dB(A) 85-120 dB(A) 120 dB(A)	No action required Hearing protection required Stop; re-evaluate	Initially and periodically during task	Daily

^a Action levels apply to sustained breathing-zone measurements above background.

^b The exact frequency of monitoring depends on field conditions and is to be determined by the SHSS; generally, every 5 to 15 minutes if acceptable; more frequently may be appropriate. Monitoring results should be recorded. Documentation should include instrument and calibration information, time, measurement results, personnel monitored, and place/location where measurement is taken (e.g., "Breathing Zone/MW-3", "at surface/SB-2", etc.).

^c If the measured percent of O₂ is less than 10, an accurate LEL reading will not be obtained. Percent LEL and percent O₂ action levels apply only to ambient working atmospheres, and not to confined-space entry. More-stringent percent LEL and O₂ action levels are required for confined-space entry (refer to Section 2).

^d Refer to SOP HS-10 for instructions and documentation on radiation monitoring and screening.

^e Noise monitoring and audiometric testing also required.

6.2 Calibration Specifications

(Refer to the respective manufacturer's instructions for proper instrument-maintenance procedures)

Air Monitoring equipment calibration specifications are listed in Table 6-2

TABLE 6-2
Air Monitoring Equipment Calibration Specifications

Instrument	Gas	Span	Reading	Method
PID: OVM, 10.6 or 11.8 eV bulb	100 ppm isobutylene	RF = 1.0	100 ppm	1.5 lpm reg T-tubing
PID: MiniRAE, 10.6 eV bulb	100 ppm isobutylene	CF = 100	100 ppm	1.5 lpm reg T-tubing
PID: TVA 1000	100 ppm isobutylene	CF = 1.0	100 ppm	1.5 lpm reg T-tubing
FID: OVA	100 ppm methane	3.0 ± 1.5	100 ppm	1.5 lpm reg T-tubing
FID: TVA 1000	100 ppm methane	NA	100 ppm	2.5 lpm reg T-tubing
Dust Monitor: Miniram-PDM3	Dust-free air	Not applicable	0.00 mg/m ³ in "Measure" mode	Dust-free area OR Z-bag with HEPA filter
CGI: MSA 260, 261, 360, or 361	0.75% pentane	N/A	50% LEL ± 5% LEL	1.5 lpm reg direct tubing

6.3 Air Sampling

Sampling, in addition to real-time monitoring, may be required by other OSHA regulations where there may be exposure to certain contaminants. Air sampling typically is required when site contaminants include lead, cadmium, arsenic, asbestos, and certain volatile organic compounds. Contact the HSM immediately if these contaminants are encountered.

7.0 Decontamination

(Reference CH2M HILL- SOP HS-13, *Decontamination*)

The SHSS must establish and monitor the decontamination procedures and their effectiveness. Decontamination procedures found to be ineffective will be modified by the SHSS. The SHSS must ensure that procedures are established for disposing of materials generated on the site.

7.1 Decontamination Specifications

Personnel	Sample Equipment	Heavy Equipment
<ul style="list-style-type: none">• Boot wash/rinse• Glove wash/rinse• Outer-glove removal• Body-suit removal• Inner-glove removal• Respirator removal• Hand wash/rinse• Face wash/rinse• Shower ASAP• Dispose of PPE in municipal trash, or contain for disposal• Dispose of personnel rinse water to facility or sanitary sewer, or contain for offsite disposal	<ul style="list-style-type: none">• Wash/rinse equipment• Solvent-rinse equipment• Contain solvent waste for offsite disposal	<ul style="list-style-type: none">• Power wash• Steam clean• Dispose of equipment rinse water to facility or sanitary sewer, or contain for offsite disposal

7.2 Diagram of Personnel-Decontamination Line

No eating, drinking, or smoking is permitted in contaminated areas and in exclusion or decontamination zones. The SHSS should establish areas for eating, drinking, and smoking. Contact lenses are not permitted in exclusion or decontamination zones.

Figure 7-1 illustrates a conceptual establishment of work zones, including the decontamination line. Work zones are to be modified by the SHSS to accommodate task-specific requirements.

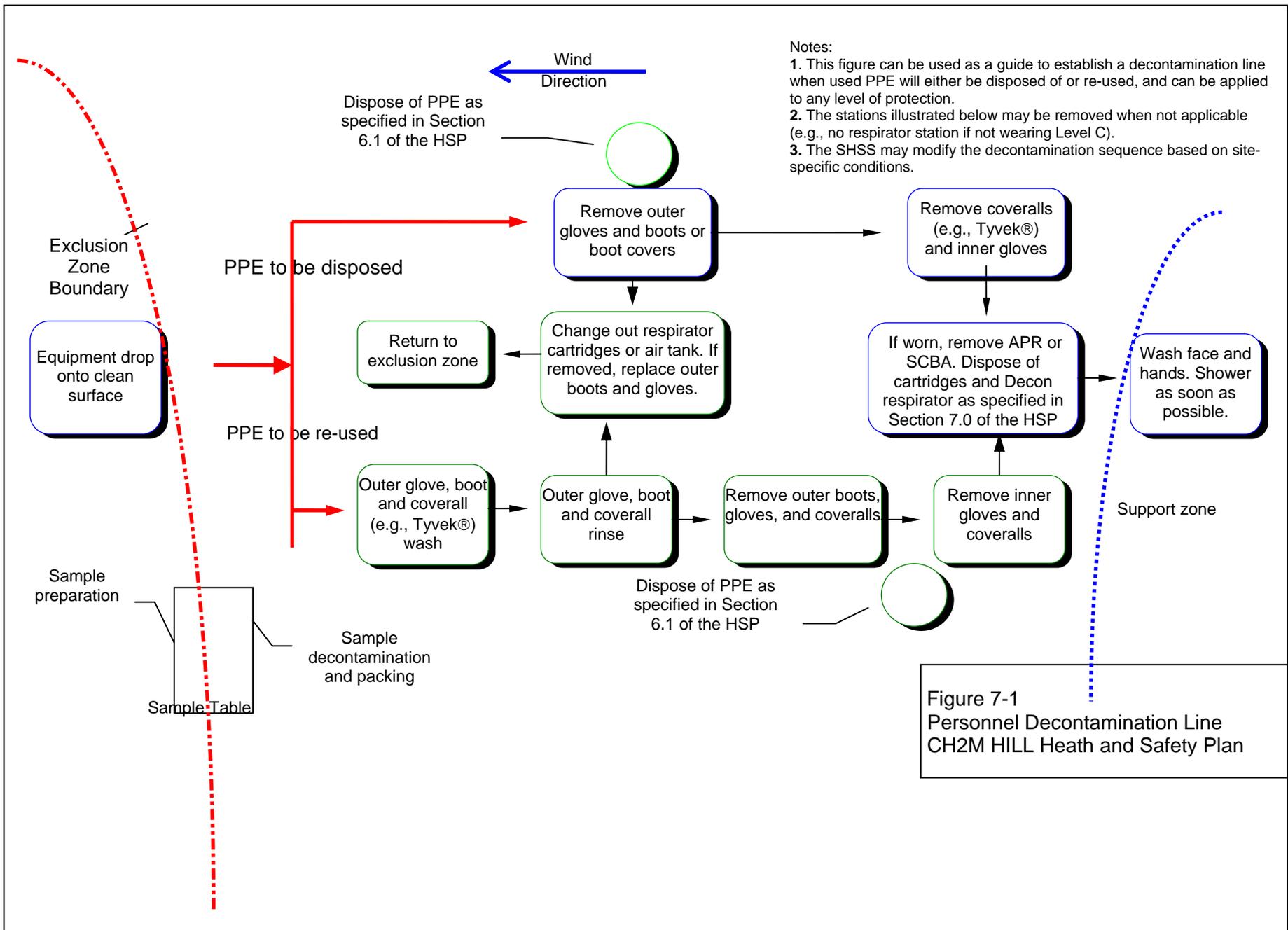


Figure 7-1
Personnel Decontamination Line
CH2M HILL Heath and Safety Plan

8.0 Spill Containment Procedures

Sorbent material will be maintained in the support zone. Incidental spills will be contained with sorbent and disposed of properly.

9.0 Site Control Plan

9.1 Site Control Procedures

(Reference CH2M HILL- SOP HS-11, *Site Control*)

- The SHSS will conduct a site safety briefing (see below) before starting field activities or as tasks and site conditions change.
- Topics for briefing on site safety: general discussion of Health and Safety Plan, site-specific hazards, locations of work zones, PPE requirements, equipment, special procedures, emergencies.
- The SHSS records attendance at safety briefings in a logbook and documents the topics discussed.
- Post the OSHA job-site poster in a central and conspicuous location in accordance with CH2M HILL- SOP HS-71, OSHA Postings.
- Establish support, decontamination, and exclusion zones. Delineate with flags or cones as appropriate. Support zone should be upwind of the site. Use access control at entry and exit from each work zone.
- Establish onsite communication consisting of the following:
 - Line-of-sight and hand signals
 - Air horn
 - Two-way radio or cellular telephone if available
- Establish offsite communication.
- Establish and maintain the “buddy system.”
- Initial air monitoring is conducted by the SHSS in appropriate level of protection.
- The SHSS is to conduct periodic inspections of work practices to determine the effectiveness of this plan (refer to Sections 2 and 3). Deficiencies are to be noted, reported to the HSM, and corrected.

9.2 Hazwoper Compliance Plan

(Reference CH2M HILL- SOP HS-19, *Site-Specific Written Safety Plans*)

Certain parts of the site work are covered by state or federal Hazwoper standards and therefore require training and medical monitoring. Anticipated Hazwoper tasks might occur consecutively or concurrently with respect to non-Hazwoper tasks. This section outlines procedures to be followed when approved activities do not require 24- or 40-hour training. Non-Hazwoper-trained personnel also must be trained in accordance with all other state and federal OSHA requirements.

- In many cases, air sampling, in addition to real-time monitoring, must confirm that there is no exposure to gases or vapors before non-Hazwoper-trained personnel are allowed on the site, or while non-Hazwoper-trained staff are working in proximity to Hazwoper activities. Other data (e.g., soil) also must document that there is no potential for exposure. The HSM must approve the interpretation of these data.
- When non-Hazwoper-trained personnel are at risk of exposure, the SHSS must post the exclusion zone and inform non-Hazwoper-trained personnel of the:
 - nature of the existing contamination and its locations
 - limitations of their access
 - emergency action plan for the site
- Periodic air monitoring with direct-reading instruments conducted during regulated tasks also should be used to ensure that non-Hazwoper-trained personnel (e.g., in an adjacent area) are not exposed to airborne contaminants.
- When exposure is possible, non-Hazwoper-trained personnel must be removed from the site until it can be demonstrated that there is no longer a potential for exposure to health and safety hazards.
- Remediation treatment system start-ups: Once a treatment system begins to pump and treat contaminated media, the site is, for the purposes of applying the Hazwoper standard, considered a treatment, storage, and disposal facility (TSDF). Therefore, once the system begins operation, only Hazwoper-trained personnel (minimum of 24 hours of training) will be permitted to enter the site. All non-Hazwoper-trained personnel must not enter the TSDF area of the site.

10.0 Emergency Response Plan

(Reference CH2M HILL- SOP HS-12, Emergency Response)

10.1 Pre-Emergency Planning

The SHSS performs the applicable pre-emergency planning tasks before starting field activities and coordinates emergency response with CH2M HILL onsite parties, the facility, and local emergency-service providers as appropriate.

- Review the facility emergency and contingency plans where applicable.
- Determine what onsite communication equipment is available (e.g., two-way radio, air horn).
- Determine what offsite communication equipment is needed (e.g., nearest telephone, cell phone).
- Confirm and post emergency telephone numbers, evacuation routes, assembly areas, and route to hospital; communicate the information to onsite personnel.
- Field Trailers: Post “Exit” signs above exit doors, and post “Fire Extinguisher” signs above locations of extinguishers. Keep areas near exits and extinguishers clear.
- Review changed site conditions, onsite operations, and personnel availability in relation to emergency response procedures.
- Where appropriate and acceptable to the client, inform emergency room and ambulance and emergency response teams of anticipated types of site emergencies.
- Designate one vehicle as the emergency vehicle; place hospital directions and map inside; keep keys in ignition during field activities.
- Inventory and check site emergency equipment, supplies, and potable water.
- Communicate emergency procedures for personnel injury, exposures, fires, explosions, and releases.
- Rehearse the emergency response plan before site activities begin, including driving route to hospital.
- Brief new workers on the emergency response plan.
- The SHSS will evaluate emergency response actions and initiate appropriate follow-up actions.

10.2 Emergency Equipment and Supplies

The SHSS should mark the locations of emergency equipment on the site map and post the map.

Emergency Equipment and Supplies	Location
20 LB (or two 10-lb) fire extinguisher (A, B, and C classes)	Support Zone/Heavy Equipment
First aid kit	Support Zone/Field Vehicle
Eye Wash	Support & Decon Zone/Field Vehicle
Potable water	Support & Decon Zone/Field Vehicle
Bloodborne-pathogen kit	Support Zone/Field Vehicle

10.3 Incident Reporting, Investigation and Response

For any accident meeting the definition of Recordable Occupational Injuries or Illnesses or Significant Accidents, the NAVFAC SE Contracting Officer and Navy Technical Representative (NTR) will be notified by the HSM or Program Manager soon as practical, but not later than four hours after occurrence. All other incidents must be reported to Southern Division, NAVFAC within 24 hours of incident occurrence.

Therefore in order for the incident to be assessed for report ability purposes it is imperative that according to CH2M HILL requirements, all personal injuries, near-misses, or property damage incidents involving CH2M HILL or subcontractor project personnel be reported IMMEDIATELY to the HSM Rich Rathnow/ORO, Project Manager Greg Wilfley/ATL, or CH2M HILL Corporate HSM Andy Strickland/DEN at the numbers identified in the emergency contact attachment contained in this plan.

The Site Manager or designee must report the following incident information to the HSM immediately after incident occurrence:

- Date and time of mishap
- Project name and project number
- Name and worker classification
- Extent of known injuries
- Level of medical attention
- Injury cause

A written incident investigation shall be performed and submitted to the HSM within 24 hours of incident occurrence by the completing the Incident Report, Near Loss Investigation and Root Cause Analysis provided in the HSP Attachments.

In fires, explosions, or chemical releases, actions to be taken include the following:

- Shut down CH2M HILL operations and evacuate the immediate work area.
- Notify appropriate response personnel.
- Account for personnel at the designated assembly area(s).

- Assess the need for site evacuation, and evacuate the site as warranted.

Instead of implementing a work-area evacuation, note that small fires or spills posing minimal safety or health hazards may be controlled.

10.4 Emergency Medical Treatment

The procedures listed below may also be applied to non-emergency incidents. CH2M HILL employee injuries and illnesses must be reported to the Human Resource contact in Attachment 4. If there is doubt about whether medical treatment is necessary, or if the injured person is reluctant to accept medical treatment, contact the CH2M HILL medical consultant, depending on whose employee is injured. During non-emergencies, follow these procedures as appropriate.

- Notify appropriate emergency response authorities (e.g., 911).
- The SHSS will assume charge during a medical emergency until the ambulance arrives or until the injured person is admitted to the emergency room.
- Prevent further injury.
- Initiate first aid and CPR where feasible.
- Get medical attention immediately.
- Perform decontamination where feasible; lifesaving and first aid or medical treatment take priority.
- Make certain that the injured person is accompanied to the emergency room.
- When contacting the medical consultant, give your name and telephone number, the name of the injured person, the extent of the injury or exposure, and the name and location of the medical facility where the injured person was taken.
- Report incident as outlined in Section 10.7.

10.5 Evacuation

- Evacuation routes and assembly areas (and alternative routes and assembly areas) are specified on the site map.
- Evacuation route(s) and assembly area(s) will be designated by the SHSS before work begins.
- Personnel will assemble at the assembly area(s) upon hearing the emergency signal for evacuation.
- The SHSS and a “buddy” will remain on the site after the site has been evacuated (if safe) to assist local responders and advise them of the nature and location of the incident.
- The SHSS will account for all personnel in the onsite assembly area.

- A designated person will account for personnel at alternate assembly area(s).
- The SHSS will write up the incident as soon as possible after it occurs and submit a report to the Corporate Director of Health and Safety.

10.6 Evacuation Signals

Signal	Meaning
Grasping throat with hand	Emergency-help me.
Thumbs up	OK; understood.
Grasping buddy's wrist	Leave area now.
Continuous sounding of horn	Emergency; leave site now.

10.7 Incident Notification and Reporting

- Upon any project incident (fire, spill, injury, near miss, death, etc.), immediately notify the PM and HSM. Call emergency beeper number if HSM is unavailable.
- For CH2M HILL work-related injuries or illnesses, contact the respective Human Resources contact listed in Attachment 4. For CH2M HILL incidents the HR administrator completes an Incident Report Form (IRF). IRF must be completed within 24 hours of incident.
- For CH2M HILL subcontractor incidents, complete the Subcontractor Accident/Illness Report Form (Attachment) and submit to the HSM.
- Notify and submit reports to client as required in contract.

11.0 Behavior Based Loss Prevention System

A Behavior Based Loss Prevention System (BBLPS) is a system to prevent or reduce losses using behavior-based tools and proven management techniques to focus on behaviors or acts that could lead to losses.

The four basic Loss Prevention tools that will be used on EE&S CH2M HILL projects to implement the BBLPS include:

- Activity Hazard Analysis (AHA)
- Pre-Task Safety Plans (PTSP)
- Loss Prevention Observations (LPO)
- Loss and Near Loss Investigations (NLI)

The Site Supervisor serves as the Site Health and Safety Specialist (SHSS) and is responsible for implementing the BBLPS on the project site. When a separate individual is assigned as the SHSS, the SHSS is delegated authority from the Site Supervisor to implement the BBLPS on the project site, but the Site Supervisor remains accountable for its implementation. The Site Supervisor/Safety Coordinator shall only oversee the subcontractor's implementation of their AHAs and PTSPs processes on the project.

11.1 Activity Hazard Analysis

An Activity Hazard Analysis (AHA) defines the activity being performed, the hazards posed and control measures required to perform the work safely. Workers are briefed on the AHA before doing the work and their input is solicited prior, during and after the performance of work to further identify the hazards posed and control measures required.

Activity Hazard Analysis will be prepared before beginning each project activity posing H&S hazards to project personnel using the AHA form provided in Attachment 6. The AHA shall identify the work tasks required to perform each activity, along with potential H&S hazards and recommended control measures for each work task. In addition, a listing of the equipment to be used to perform the activity, inspection requirements and training requirements for the safe operation of the equipment listed must be identified.

An AHA shall be prepared for all field activities performed by CH2M HILL and subcontractor during the course of the project by the Site Supervisor/SHSS. The Project-Specific and General Hazards of the HSP, the Hazard Analysis Table (Table 2-1), and applicable CH2M HILL Standards of Practice (SOPs) should be used as a basis for preparing CH2M HILL AHAs.

CH2M HILL subcontractors are required to provide AHAs specific to their scope of work on the project for acceptance by CH2M HILL. Each subcontractor shall submit AHAs for their field activities, as defined in their work plan/scope of work, along with their project-specific HSP. Additions or changes in CH2M HILL or subcontractor field activities, equipment, tools or material to perform work or additional/different hazard encountered that require

additional/different hazard control measures requires either a new AHA to be prepared or an existing AHA to be revised.

11.2 Pre-Task Safety Plans

Daily safety meetings are held with all project personnel in attendance to review the hazards posed and required H&S procedures/AHAs, which apply for each day's project activities. The PTSPs serve the same purpose as these general assembly safety meetings, but the PTSPs are held between the crew supervisor and their work crews to focus on those hazards posed to individual work crews. At the start of each day's activities, the crew supervisor completes the PTSP, provided in Attachment 6, with input from the work crew, during their daily safety meeting. The day's tasks, personnel, tools and equipment that will be used to perform these tasks are listed, along with the hazards posed and required H&S procedures, as identified in the AHA. The use of PTSPs, better promotes worker participation in the hazard recognition and control process, while reinforcing the task-specific hazard and required H&S procedures with the crew each day. The use of PTSPs is a common safety practice in the construction industry.

11.3 Loss Prevention Observations

Loss Prevention Observations (LPOs) shall be conducted by Site Supervisor/SHSS for specific work tasks or operations comparing the actual work process against established safe work procedures identified in the project-specific HSP and AHAs. LPOs are a tool to be used by supervisors to provide positive reinforcement for work practices performed correctly, while also identifying and eliminating deviations from safe work procedures that could result in a loss. Site Supervisor/SHSS shall perform at least one LPO each week for a tasks/operations addressed in the project-specific HSP or AHA. The Site Supervisor/SHSS shall complete the LPO form in Attachment 6 for the task/operation being observed.

11.4 Loss/Near Loss Investigations

Loss/Near Loss Investigations shall be performed for the all CH2M HILL and subcontractor incidents involving:

- Person injuries/illnesses and near miss injuries
- Equipment/property damage
- Spills, leaks, regulatory violations
- Motor vehicle accidents

The cause of loss and near loss incidents is similar, so by identifying and correcting the causes of near loss causes, future loss incidents may be prevented. The following is the Loss/Near Loss Investigation Process:

- Gather all relevant facts, focusing on fact-finding, not fault-finding, while answering the who, what, when, where and how questions.
- Draw conclusions, pitting facts together into a probable scenario.

- Determine incident root cause(s), which are basic causes on why an unsafe act/condition existed.
- Develop and implement solutions, matching all identified root causes with solutions.
- Communicate incident as a Lesson Learned to all project personnel.
- Filed follow-up on implemented corrective active action to confirm solution is appropriate.

Site Supervisors/SHSS shall perform an incident investigation, as soon as practical after incident occurrence during the day of the incident, for all Loss and Near Loss Incidents that occur on the project. Loss and Near Loss incident investigations shall be performed using the following incident investigation forms provided in Attachment 6:

- Incident Report Form (IRF)
- Incident Investigation Form
- Root Cause Analysis Form

All Loss and Near Loss incident involving personal injury, property damage in excess of \$1,000 or near loss incidents that could have resulted in serious consequences shall be investigated by completing the incident investigation forms and submitting them to the PM and HSM within 24 hours of incident occurrence. A preliminary Incident Investigation and Root Cause Analysis shall be submitted to the Project Manager and HSM within 24 hours of incident occurs. The final Incident Investigation and Root Cause Analysis shall be submitted after completing a comprehensive investigation of the incident.

12.0 Approval

This site-specific Health and Safety Plan has been written for use by CH2M HILL only. CH2M HILL claims no responsibility for its use by others unless that use has been specified and defined in project or contract documents. The plan is written for the specific site conditions, purposes, dates, and personnel specified and must be amended if those conditions change.

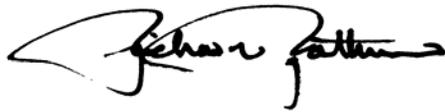
12.1 Original Plan

Written By: Phyllis Zerangue

Date: 01/17/2008

Approved By: Richard Rathnow

Date: 01/18/2008



12.2 Revisions

Revisions Made By:

Date:

Revisions to Plan:

Revisions Approved By:

Date:

Attachment 1

Employee Signoff Form

Attachment 2

Project-Specific Chemical Product Hazard Communication Form

Attachment 3

Chemical Specific Training Form

CHEMICAL-SPECIFIC TRAINING FORM

Location:	Project #:
SHSS:	Trainer:

TRAINING PARTICIPANTS:

NAME	SIGNATURE	NAME	SIGNATURE

REGULATED PRODUCTS/TASKS COVERED BY THIS TRAINING:

The HCC shall use the product MSDS to provide the following information concerning each of the products listed above.

- Physical and health hazards
- Control measures that can be used to provide protection (including appropriate work practices, emergency procedures, and personal protective equipment to be used)
- Methods and observations used to detect the presence or release of the regulated product in the workplace (including periodic monitoring, continuous monitoring devices, visual appearance or odor of regulated product when being released, etc.)

Training participants shall have the opportunity to ask questions concerning these products and, upon completion of this training, will understand the product hazards and appropriate control measures available for their protection.

Copies of MSDSs, chemical inventories, and CH2M HILL's written hazard communication program shall be made available for employee review in the facility/project hazard communication file.

Attachment 4

Emergency Contacts

Emergency Contacts-

If injured on the job, notify your supervisor and then call 1-800-756-1130 to contact CH2M HILL'S Occupational Nurse

24-hour CH2M HILL Emergency Beeper – 720/286-4911

Medical Emergency – 911

Facility Medical Response #:

Local Ambulance #:

CH2M HILL- Medical Consultant

Dr. Jerry H. Berke, M.D., M.P.H.

Health Resources

600 West Cummings Park, Suite 3400

Woburn, MA 01801-6350

781/938-4653

800/350-4511

(After hours calls will be returned within 20 minutes)

Fire/Spill Emergency -- 911

Facility Fire Response #:

Local Fire Dept #:

Local Occupational Physician

Security & Police – 911

Facility Security #:

Local Police #:

Navy RAC Program Manager

Name: Sid Allison/CLT

Phone: 843-242-8018

Utilities Emergency

Water:

Gas:

Electric:

Navy RAC Health and Safety Manager (HSM)

Name: Rich Rathnow/KNV

Phone: 865/560-2908 (Office); 865/607-6734 (Cell)

865/531-2933 (Home)

Site Health and Safety Specialist (SHSS)

Name: TBD

Phone:

CH2M HILL Human Resources Department

Name: Nancy Orr/COR

Phone: 303/771-0952

Project Manager

Name: Greg Wilfley

Phone: 770/604-9095

Corporate Human Resources Department

Name: John Monark/COR

Phone: 303/771-0900

Federal Express Dangerous Goods Shipping

Phone: 800/238-5355

Emergency Number for Shipping

Dangerous Goods

Phone: 800/255-3924

CH2M HILL Worker's Compensation and Auto Claims

Sterling Administration Services

Phone: 800/420-8926 After hours: 800/497-4566

Report fatalities AND report vehicular accidents involving pedestrians, motorcycles, or more than two cars.

Contact the Project Manager. Generally, the Project Manager will contact relevant government agencies.

Facility Alarms:

Evacuation Assembly Area(s):

Facility/Site Evacuation Route(s):

Hospital Name/Address:
Baptist Hospital

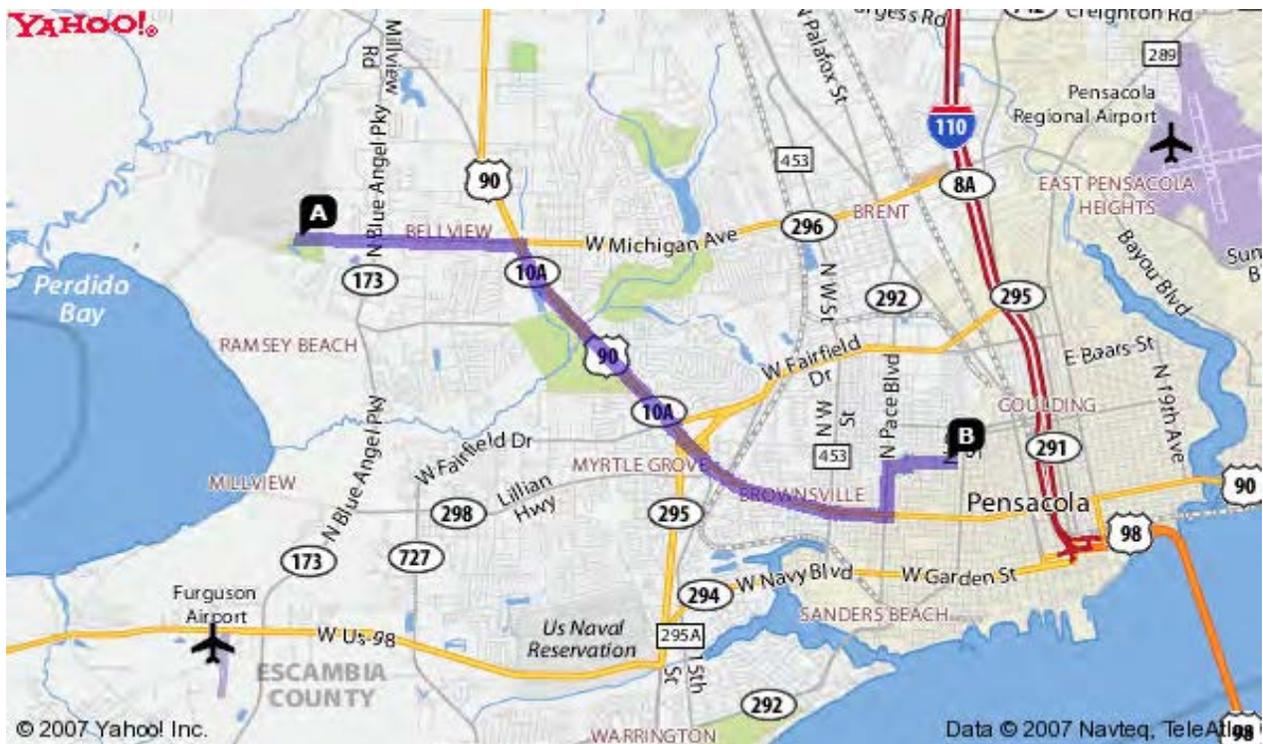
Hospital Phone #: (850)434-4011

Directions to Hospital

See map next page

Baptist Hospital
1000 West Moreno Street
Pensacola, FL
Phone: (850) 434-4011

- | | |
|---|-----------|
| 1. Begin at Saufley Field Road | go 2.1 mi |
| 2. Turn right on Mobile HWY (U.S. 90 E) | go 4.2 mi |
| 3. Continue to follow US-90 E | go 0.5 mi |
| 4. Turn left on N. Pace BLVD (SR-292) | go 0.5 mi |
| 5. Turn right on W. Blount St. | go 0.2 mi |
| 6. Continue on W. Moreno St. | go 0.4 mi |
| 7. Arrive at 1000 W. Moreno St. | |



Attachment 5

Project Activity Self-Assessment Checklists/Permits

Hand and Power Tools
Petroleum Storage

This checklist shall be used by CH2M HILL personnel **only** and shall be completed at the frequency specified in the project’s HSP/FSI.

This checklist is to be used at locations where: 1) CH2M HILL employees are exposed to hand and power tool hazards and/or 2) CH2M HILL provides oversight of subcontractor personnel who are exposed to hand and power tool hazards.

SSC or DSC may consult with subcontractors when completing this checklist, but shall not direct the means and methods of hand and power tool use nor direct the details of corrective actions. Subcontractors shall determine how to correct deficiencies and we must carefully rely on their expertise. Items considered to be imminently dangerous (possibility of serious injury or death) shall be corrected immediately or all exposed personnel shall be removed from the hazard until corrected.

Completed checklists shall be sent to the HS&E Staff for review.

Project Name: _____ Project No.: _____
 Location: _____ PM: _____
 Auditor: _____ Title: _____ Date: _____

This specific checklist has been completed to:

Evaluate CH2M HILL employee exposure to hand and power tool hazards.
 Evaluate a CH2M HILL subcontractor’s compliance with hand and power tool requirements.
 Subcontractors Name: _____

- Check “Yes” if an assessment item is complete/correct.
 - Check “No” if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the subcontractor. Section 3 must be completed for all items checked “No.”
 - Check “N/A” if an item is not applicable.
 - Check “N/O” if an item is applicable but was not observed during the assessment.
- Numbers in parentheses indicate where a description of this assessment item can be found in Standard of Practice HS-50.

SECTION 1

Yes No N/A N/O

SAFE WORK PRACTICES (3.1)

1. All tools operated according to manufacturer’s instructions and design limitations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. All hand and power tools maintained in a safe condition and inspected and tested before use.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Defective tools are tagged and removed from service until repaired.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. PPE is selected and used according to tool-specific hazards anticipated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Power tools are not carried or lowered by their cord or hose.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Tools are disconnected from energy sources when not in use, servicing, cleaning, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Safety guards remain installed or are promptly replaced after repair.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Tools are stored properly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Cordless tools and recharging units both conform to electrical standards and specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Tools used in explosive environments are rated for such use.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Knife or blade hand tools are used with the proper precautions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Consider controls to avoid muscular skeletal, repetitive motion, and cumulative trauma stressors.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION 2

Yes No N/A N/O

GENERAL (3.2.1)

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 13. PPE is selected and used according to tool-specific hazards anticipated. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Tools are tested daily to assure safety devices are operating properly. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. Damaged tools are removed from service until repaired. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. Power operated tools designed to accommodate guards have guards installed. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. Rotating or moving parts on tools are properly guarded. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. Machines designed for fixed locations are secured or anchored. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 19. Floor and bench-mounted grinders are provided with properly positioned work rests. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 20. Guards are provided at point of operation, nip points, rotating parts, etc. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 21. Fluid used in hydraulic-powered tools is approved fire-resistant fluid. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

ELECTRIC-POWERED TOOLS (3.2.2)

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 22. Electric tools are approved double insulated or grounded and used according to SOP HS-23. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 23. Electric cords are not used for hoisting or lowering tools. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 24. Electric tools are used in damp/ wet locations are approved for such locations or GFCI installed. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 25. Hand-held tools are equipped with appropriate on/off controls appropriate for the tool. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 26. Portable, power-driven circular saws are equipped with proper guards. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

ABRASIVE WHEEL TOOLS (3.2.3)

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 27. All employees using abrasive wheel tools are wearing eye protection. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 28. All grinding machines are supplied with sufficient power to maintain spindle speed. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 29. Abrasive wheels are closely inspected and ring-tested before use. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 30. Grinding wheels are properly installed. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 31. Cup-type wheels for external grinding are protected by the proper guard or flanges. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 32. Portable abrasive wheels used for internal grinding are protected by safety flanges. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 33. Safety flanges are used only with wheels designed to fit the flanges. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 34. Safety guards on abrasive wheel tools are mounted properly and of sufficient strength. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

PNEUMATIC-POWERED TOOLS (3.2.4)

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 35. Tools are secured to hoses or whip by positive means to prevent disconnection. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 36. Safety clips or retainers are installed to prevent attachments being expelled. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 37. Safety devices are installed on automatic fastener feed tools as required. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 38. Compressed air is not used for cleaning unless reduced to < 30 psi, with PPE, and guarded. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 39. Manufacturer’s safe operating pressure for hoses, pipes, valves, etc. are not exceeded. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 40. Hoses are not used for hoisting or lowering tools. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 41. All hoses >1/2-inch diameter have safety device at source to reduce pressure upon hose failure. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 42. Airless spray guns have required safety devices installed. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 43. Blast cleaning nozzles are equipped with operating valves, which are held open manually. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 44. Supports are provided for mounting nozzles when not in use. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 45. Air receiver drains, handholes, and manholes are easily accessible. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 46. Air receivers are equipped with drainpipes and valves for removal of accumulated oil and water. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 47. Air receivers are completely drained at required intervals. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 48. Air receivers are equipped with indicating pressure gauges. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 49. Safety, indicating, and controlling devices are installed as required. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 50. Safety valves are tested frequently and at regular intervals to assure good operating condition. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION 2 (continued)

Yes No N/A N/O

LIQUID FUEL-POWERED TOOLS (3.2.5)

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 51. Liquid fuel-powered tools are stopped when refueling, servicing, or maintaining. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 52. Liquid fuels are stored, handled, and transported in accordance with SOP HS-21 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 53. Liquid fuel-powered tools are used in confined spaces in accordance with SOP HS-17. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 54. Safe operating pressures of hoses, valves, pipes, filters, and other fittings are not exceeded. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

POWDER-ACTUATED TOOLS (3.2.6)

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 55. Only trained employee operates powder-actuated tools. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 56. Powder-actuated tools are not loaded until just prior to intended firing time. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 57. Tools are not pointed at any employee at any time. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 58. Hands are kept clear of open barrel end. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 59. Loaded tools are not left unattended. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 60. Fasteners are not driven into very hard or brittle materials. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 61. Fasteners are not driven into easily penetrated materials unless suitable backing is provided. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 62. Fasteners are not driven into spalled areas. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 63. Powder-actuated tools are not used in an explosive or flammable atmosphere. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 64. All tools are used with correct shields, guards, or attachments recommended by manufacturer. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

JACKING TOOLS (3.2.7)

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 65. Rated capacities are legibly marked on jacks and not exceeded. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 66. Jacks have a positive stop to prevent over-travel. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 67. The base of jacks are blocked or cribbed to provide a firm foundation, when required. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 68. Wood blocks are place between the cap and load to prevent slippage, when required. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 69. After load is raised, it is cribbed, blocked, or otherwise secured immediately. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 70. Antifreeze is used when hydraulic jacks are exposed to freezing temperatures. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 71. All jacks are properly lubricated. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 72. Jacks are inspected as required. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 73. Repair or replacement parts are examined for possible defects. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 74. Jacks not working properly are removed from service and repaired or replaced. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

HAND TOOLS (3.2.8)

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 75. Wrenches are not used when jaws are sprung to the point of slippage. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 76. Impact tools are kept free of mushroomed heads. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 77. Wooden handles of tools are kept free of splinters or cracks and are tightly fitted in tool. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

CH2MHILL

Petroleum Storage Standard of Practice HSE-86

1.0 Introduction

This Standard of Practice (SOP) describes procedures for onsite storage of petroleum prior to its use as fuel or lubricant. Your client's facility may already have in place plans and procedures for petroleum storage. Refer to the client's plan for facility-specific procedures, and contact your Environmental Compliance Coordinator ([ECC](#)) for more information about any of the topics contained in this SOP.

2.0 Regulatory Review

There are a number of federal rules that regulate petroleum storage, including OSHA and environmental protection regulations. Safe storage of petroleum and other flammable substances in aboveground and underground storage tanks and in other containers is regulated by OSHA (29 CFR 1926.152), as well as state and local fire codes. Storage of petroleum in underground storage tanks (USTs) at a site is governed by Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (40 CFR 280 and associated state programs). The Oil Pollution Prevention Regulations (40 CFR 112) further regulate storage of petroleum at certain types of sites.

2.1 OSHA Fire Protection Regulations

The OSHA Fire Protection Standards (29 CFR 1926.152) identify requirements for safe storage and dispensing of petroleum and other flammable substances, and include requirements for installing and maintaining aboveground storage tanks (ASTs) and USTs. Refer to these regulations and any state or local fire codes prior to installing tanks or storing petroleum at a site.

2.2 Underground Storage Tank Regulations

UST systems comprise one tank or a combination of tanks (including connected underground pipes) that are used to contain oil or other regulated substances, the volume of which is 10 percent or more beneath the surface of the ground (including the volume of the connected underground pipes). Construction, operation and monitoring of these systems is regulated by federal and state-specific regulations designed to prevent and/or detect belowground releases from the UST system and apply to all owners and operators of a UST system. However, the following UST systems are excluded from the requirements of the regulation:

- Any UST system whose capacity is 110 gallons or less
- Tanks holding hazardous waste
- Wastewater treatment tanks
- Tanks holding oil for operational purposes (e.g., hydraulic lift tanks)
- Any UST system that contains a *de minimis* concentration of regulated substance

- Any emergency spill or overflow containment UST system that is expeditiously emptied after use

Design, construction, installation, and closure requirements for new and existing UST systems are codified in 40 CFR 280, Subpart B and in state-specific UST regulations. In most cases, UST systems must also be registered with, or permitted by, the state agency tasked with environmental protection, and be monitored and/or tested on a regular basis.

2.3 Oil Pollution Prevention Regulation

The Oil Pollution Prevention Regulations were developed to protect waterways and associated shorelines from releases of oil from sites where petroleum is stored. This regulation requires development of a Spill Prevention, Control and Countermeasure (SPCC) Plan and a Facility Response Plan (FRP), for facilities storing certain amounts of petroleum on land. In addition to these plans, other types of petroleum storage and distribution operations are covered by separate plan requirements, including:

- Marine Terminal Response Plan (33 CFR 154, Subpart F)
- Onshore Pipeline Response Plan (49 CFR 194)
- Offsite Pipeline Facility Procedural Manual (49 CFR 195)
- Offshore Facility Spill Response Plan (30 CFR 254)
- Highway and Railway Oil Transportation Response Plan (49 CFR 130)

Although these specialized plans are not discussed in this SOP, you should obtain copies of any plans that are in place at a client facility.

2.3.1 Spill Prevention, Control and Countermeasure Plan

The SPCC Plan rule applies to storage of petroleum at facilities with the following conditions:

- Petroleum storage is not related to transportation,
- Facility has aboveground storage capacity greater than 660 gallons in a single container, or an aggregate storage capacity greater than 1,320 gallons, or a total underground storage capacity greater than 42,000 gallons, and
- There is a reasonable expectation of a discharge to navigable waters or adjoining shorelines.

The SPCC Plan developed for a facility incorporates many of the requirements for petroleum storage, leak detection, testing and monitoring required under OSHA and UST programs, and therefore the focus of this SOP is on compliance with SPCC Plan requirements. A template for the preparation of a SPCC Plan for a facility which does not already have one is provided on the HS&E web site.

2.3.2 Facility Response Plan

A facility is subject to the Facility Response Plan (FRP) requirements if it is a high-risk facility that poses a threat of substantial harm to the environment. A facility has the potential to cause substantial harm if it has one of the following characteristics:

- It transfers oil over water to or from vessels and has a total oil storage capacity, including both ASTs and USTs, greater than or equal to 42,000 gallons; or
- Its total oil storage capacity, including both ASTs and USTs, is greater than or equal to one million gallons, and one of the following is true:
 - The facility lacks secondary containment able to contain the capacity of the largest AST within each storage area plus freeboard to allow for precipitation;
 - The facility is located at a distance such that a discharge from the facility could cause injury to an environmentally sensitive area;
 - The facility is located at a distance such that a discharge from the facility would shut down a public drinking-water intake; or
 - The facility has had a reportable spill greater than or equal to 10,000 gallons within the last 5 years.

3.0 Responsibilities

3.1 Project Manager

The Project Manager (PM) is responsible for ensuring the project complies with the requirements of this SOP. The PM must ensure project personnel are trained and familiar with project plans, including an SPCC Plan, if required, and designating one person as accountable for spill prevention on the project.

3.2 Environmental Compliance Coordinator

The Environmental Compliance Coordinator (ECC) is responsible for assisting the Project Manager and Safety Coordinator in complying with the requirements of this SOP.

3.3 Safety Coordinator

The Safety Coordinator (SC) is responsible for ensuring the requirements of this SOP are implemented in the field.

4.0 CH2M HILL Policy

It is CH2M HILL policy to comply with all applicable laws and regulations.

5.0 Definitions

Aboveground Release – refers to any release to the surface of the land or to surface water. This includes but is not limited to, releases from ASTs, the aboveground portion of a UST system, and aboveground releases associated with overfills and transfer operations as the petroleum moves to or from a UST system.

Aboveground Tank – refers to a tank used to store petroleum that is not an underground storage tank.

Belowground Release – refers to any release to the subsurface of the land and to groundwater.

Cathodic Protection – is a technique to prevent corrosion of a metal surface by making that surface the cathode of an electrochemical cell.

Discharge – includes but is not limited to, any spilling, leaking, pumping, pouring, emitting, emptying or dumping.

Fish and wildlife and sensitive environments – these areas may include wetlands, National and State Parks, critical habitats for endangered/threatened species, wilderness and natural resource areas, marine sanctuaries, and a variety of other environments (see 40 CFR 112.2).

Navigable waters – refers to United States waters (including the territorial seas), and includes interstate waters, intrastate lakes, rivers, and streams that are utilized by interstate travelers for recreational or other purposes, and intrastate lakes, rivers, and streams, from which fish, or shellfish are taken and sold in interstate commerce.

Oil – refers to oil of any kind or in any form, including, but not limited to petroleum, fuel oil, sludge, oil refuse and oil mixed with wastes other than dredged spoil.

Petroleum UST System – refers to an underground storage tank system that contains petroleum or a mixture of petroleum with *de minimis* quantities of other regulated substances. Such systems include those containing motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils.

Release – refers to any spilling, leaking, emitting, discharging, escaping, leaching or disposing from an AST or UST into groundwater, surface water, or subsurface soils.

Release Detection – refers to determining whether a release of a regulated substance has occurred from an AST or UST system into the environment, or into the interstitial space between the system and its secondary barrier or secondary containment around it.

Spill Event – refers to a discharge of oil into or upon the navigable waters of the United States or adjoining shorelines in harmful quantities, as defined in 40 CFR, part 110.

Tank – is a stationary device, designed to contain an accumulation of oil which is constructed primarily of non-earthen materials (e.g., concrete, steel, plastic) which provides structural support.

Underground Storage Tank – refers to any one or combination of tanks (including underground pipes connected thereto) that is used to contain an accumulation of regulated substances, the volume of which is 10 percent or more beneath the surface of the ground (including the volume of the underground pipes connected thereto).

6.0 Petroleum Storage Procedures

6.1 Spill Containment Structures

All petroleum storage facilities must have oil spill containment structures to prevent oil spills and contaminated run off from reaching storm drains or navigable waters. Containment and diversionary structures may consist of dikes, berms, curbing, culverts, trenches, absorbent material, retention ponds, weirs, booms, and other barriers or equivalent systems.

6.2 Facility Drainage

Contained areas are “diked” areas, and are intended to hold liquid so that it is not released to the surrounding environment. As such, storm water tends to accumulate in them. Watertight drain lines should be installed through the dike walls to allow drainage of the accumulated storm water. These lines should be fitted with manually operated open-close valves or other means of closure that are normally in sealed, closed, and locked positions. The SPCC Plan should address procedures for drainage operations, including the following specific operations that must take place before anyone drains water:

- Visually inspect the diked areas around tanks to ensure that the water does not have an oil sheen and will not cause a harmful discharge;
- Opening, closing, and locking the bypass valve under responsible supervision following drainage; and
- Keeping adequate records of each drainage operation.

Keep an adequate record, recording information including the time, date, and employee who performed the operation. Records should be made part of, or be referenced in, the SPCC Plan and kept for a minimum of 3 years. If an oil sheen or any accumulated oil is observed, use an alternate method for draining the diked area and for capturing the contaminated water for treatment. For example, divert the contaminated water to an onsite treatment plant or oil-water separator. The contaminated water should not be drained to any location where it may affect a waterway or shoreline.

There may be no secondary containment system specifically designed for tank car and truck loading and unloading areas, truck or engine washdown areas, piping and manifold areas, garage bays, and fuel islands. These uncontained areas are “undiked” areas, and should have drainage control measures. Use a combination of curbing, trenches, catchment basins, and retention ponds to retain or reroute a spill. Inspect these structures to ensure their integrity and effectiveness.

6.3 Storage Tanks

Storage containers or tanks used to store oil may be underground, partially underground, aboveground, and inside buildings. Do not use a tank to store oil unless the tank material and construction are suitable for this purpose and for the conditions of storage (e.g., pressure, physical and chemical properties, and temperatures). State or local regulations may require that you use industry standards for tanks. Bulk storage facility storage containers (e.g., tanks, oil-water separators) must have secondary containment for the entire contents of the largest single container with sufficient freeboard to allow for precipitation. The volume of freeboard should be sufficient to contain the rainfall from a 100-year, 24-hour storm event.

USTs should be composed of fiberglass-reinforced plastics to prevent corrosion. If metal tanks are used, be sure it has a corrosion-resistant coating or cathodic protection.

6.4 Integrity Testing

Periodically, a competent person should examine each AST for integrity. The worker may use techniques such as:

- X-ray or radiographic analysis to measure wall thickness and detect cracks and crevices in metal
- Ultrasonic analysis to measure shell metal thickness
- Hydrostatic testing to identify leaks caused by pressure
- Visual inspection to detect cracks, leaks, or holes
- Magnetic flux eddy current test used in conjunction with ultrasonic analysis to detect pitting

A competent person should check the outside of the tank for signs of deterioration, leaks that might cause a spill, and for the presence of accumulated oil inside diked areas. AST tank bottoms may be subject to extensive corrosion, which may go undetected during visual inspections.

Also, the foundation and supports for each tank should be examined. If a tank sits on a foundation, check for large gaps between the foundation and the tank bottom and for crumbling or excessive cracking in a concrete foundation. Assess whether a storage tank foundation provides adequate support for the tank. If the tank sits directly on the ground, check for large gaps between the ground surface and the tank bottom. Document all leaks in an inspection form and report them to the person in charge of spill prevention at your facility. Leaks should be repaired immediately.

Periodic integrity testing is also required for certain types of UST systems and buried piping; the type and frequency of testing are prescribed in federal and state regulations and are generally dependent on tank age and construction materials. Refer to the appropriate state UST regulations to determine the appropriate compliance schedule and leak reporting requirements.

6.5 Internal Heating Coils

Internal steam-heating coils are sometimes used in heavy oil tanks to keep the oil in a fluid, less viscous state in cold weather. These coils may corrode, and when oil drains through a corroded coil, it may leak. To control for these leaks, monitor the steam return or exhaust lines for contamination from internal heating coils that discharge into an open water course. Oil can also be removed by routing the steam return or exhaust line to a settling tank, skimmer, or other separation system. If necessary, consider using external heating coils and insulating the sides of the tank.

6.6 Fail-Safe Devices—Level Gauging Systems and Alarms

To ensure that tanks are not overfilled, use fail-safe systems (gauging and alarms) to prevent the tank from overfilling and to prevent damage to the tank. Select level gauging systems that are in accordance with good engineering practices. Some larger tanks may have gauges and high-level alarms as the fail-safe system.

6.7 Portable Oil Storage Containers

Position or locate mobile or portable oil storage tanks (including trucks containing product), 55-gallon drums, and other small containers to prevent spilled oil from reaching navigable waters. Remember that secondary containment (e.g., dikes, basins, or spill pallets) that can hold the contents of the largest container stored in the area should be provided. If you have

a small number of drums, purchase spill pallets or portable containment devices (e.g., overpack drums) designed for drum containment. A good practice is to keep drums and portable oil tanks inside and covered in storage areas that are safe from periodic flooding or washout. Small containers of gasoline and other flammable liquids should be kept in appropriately marked and placarded cabinets. State and local fire codes, as well as OSHA Fire Protection Standards, prescribe the appropriate location of, and spacing for, storage of portable containers holding flammable liquids.

6.8 Piping

6.8.1 Buried Piping

Buried piping should be periodically pressure tested. If the piping material is metal, ensure that buried piping installations have a protective wrapping and coating. If metal pipes are in corrosive soil, apply cathodic protection, examine any section of exposed buried piping for deterioration and corrosion, and make any necessary repairs.

6.8.2 Cap, Blank-flange and Mark Pipes

Cap or blank-flange and mark the origin of the terminal connection at the transfer point of any pipeline that is out of service or in standby service for an extended time.

6.8.3 Proper Design and Spacing

Pipe supports should be designed and spaced to expand and contract, prevent sagging, and minimize abrasion and corrosion.

6.8.4 Inspections of Aboveground Pipes, Valves, and Pumps

Schedule regular examination of aboveground pipes, valves, pumps, gauges, flange joints, valve glands and bodies, supports, and metal surfaces. Periodically pack flow valves with grease, replace gaskets, rebuild pumps, and reseal connecting lines. Repair and replace any leaking or defective devices, and keep an adequate record of these repairs in your SPCC Plan for a minimum of 3 years.

6.8.5 Warning Signs for Aboveground Pipes

To ensure that large vehicle operations do not interfere with aboveground piping or hosing, warn drivers at your site of the presence of aboveground pipes in traffic areas. Tell them or post signs. Use appropriate protection in tank truck loading and unloading areas for aboveground pipes (e.g., bumper poles).

6.9 Tank Car and Tank Truck Loading and Unloading

Loading and unloading must be conducted in a manner to prevent spills. Refer to the SPCC template for specific guidelines on loading and unloading.

6.10 Security

The SPCC rule requires simple security measures that greatly reduce the risks of releases—whether accidental, deliberate (e.g., vandalism), or an act of nature (e.g., lightning). These measures may include the following:

- Protecting your facility with full fencing, good lighting, and locked or guarded gates
- Installation of devices such as motion detectors and video cameras
- Restricting access to your facility during non-business hours
- Locking starter controls for fuel pumps and any valves that will allow the direct outflow of product when they are not in use
- Capping or blank-flanging loading and unloading connections and pipelines when they are not in use.

7.0 Attachments

Attachment 1: Self-Assessment Checklist

This checklist shall be used by CH2M HILL personnel **only** and shall be completed at the frequency specified in the project’s HSP/FSI.

This checklist is to be used at locations where: (1) CH2M HILL employees are exposed to petroleum storage hazards and/or (2) CH2M HILL provides oversight of subcontractor personnel who are engaged in petroleum storage operations.

SC-HW or SC-C may consult with subcontractors when completing this checklist, but shall not direct the means and methods of petroleum storage operations nor direct the details of corrective actions. Subcontractors shall determine how to correct deficiencies and we must carefully rely on their expertise. Items considered to be imminently dangerous (possibility of serious injury or death) shall be corrected immediately or all exposed personnel shall be removed from the hazard until corrected.

Completed checklists shall be sent to the HS&E Staff for review.

Project Name: _____ Project No.: _____
 Location: _____ PM: _____
 Auditor: _____ Title: _____ Date: _____

This specific checklist has been completed to:

Evaluate CH2M HILL employee exposure to petroleum storage hazards
 Evaluate a CH2M HILL subcontractor’s compliance with the petroleum storage requirements
 Subcontractors Name: _____

- Check “Yes” if an assessment item is complete/correct.
 - Check “No” if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the subcontractor. Section 3 must be completed for all items checked “No.”
 - Check “N/A” if an item is not applicable.
 - Check “N/O” if an item is applicable but was not observed during the assessment.
- Numbers in parentheses indicate where a description of this assessment item can be found in Standard of Practice HS-86.

		<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>N/O</u>
<u>SECTION 1</u>					
PETROLEUM STORAGE PROCEDURES (6.0)					
Spill Containment Structures (6.1)					
1.	Petroleum storage facilities have oil spill containment structures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	SPCC Plan prepared.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Facility Drainage (6.2)					
3.	Watertight drain lines have been installed with open/close valves to allow for drainage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	SPCC plan contains procedures for drainage operations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Prior to draining water, the liquid in the diked area is inspected for oil sheen.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	Locking bypass valve opened, closed and locked under responsible supervision.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	Drainage operation records include date, time, and employee details.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	Drainage records part of the SPCC plan and kept for 3 years.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION 2

- | | Yes | No | N/A | N/O |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 9. If oil sheen is observed an alternate method is used to capture the liquid for treatment. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Undiked areas have drainage control measures. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Drainage control measures include curbing, trenches, catch basins and retention ponds. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Drainage control measures have been inspected to ensure their integrity. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

STORAGE TANKS (6.3)

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 13. Tank material and construction is suitable for storing petroleum products. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Industry standards used in tank construction/installation. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. Bulk storage facility storage containers have secondary containment as required. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. UST composed of corrosion resistant materials. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

INTEGRITY TESTING (6.4)

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 17. The AST is examined for integrity. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. Outside tank checked for signs of deterioration, leaks, or the presence of oil in diked areas | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 19. Foundation and supports checked for gaps or cracking in concrete. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 20. Tank on ground surface checked for gaps between the bottom of tank and the ground. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 21. Leaks documented and reported to person in charge of spill prevention. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 22. Leaks are repaired immediately. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 23. State UST regulations followed for integrity testing. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

INTERNAL HEATING COILS (6.5)

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 24. Tanks contain internal heating coils. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 25. Steam return or exhaust lines monitored for leaks from internal heating coils. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

FAIL-SAFE DEVICES – LEVEL GAUGING SYSTEMS AND ALARMS (6.6)

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 26. Fail-safe systems are in place to prevent the tank from overflowing and other damage. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|--------------------------|

PORTABLE OIL STORAGE CONTAINERS (6.7)

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 27. Mobile oil storage tanks are positioned to prevent spills from reaching navigable waters. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 28. Secondary containment is available to hold contents of largest container. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 29. Drums and portable containers are kept inside and covered in storage areas. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 30. Small containers kept in appropriately marked and placarded cabinets. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 31. State and local fire codes and OSHA standards followed for storage of flammable liquids. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

PIPING (6.8)

Buried Piping (6.8.1)

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 32. Buried piping is pressure tested periodically | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 33. Metal piping has protective wrapping and coating. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 34. Cathodic protection applied as necessary. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 35. Exposed area of piping not deteriorating or corroding. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Cap, Blank-Flange, and Mark Pipes (6.8.2)

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 36. Out of service pipelines capped, blank-flanged and marked at the transfer point. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|--------------------------|

Proper Design and Spacing (6.8.3)

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 37. Pipe supports designed to expand/contract, prevent sagging, and minimize abrasion/corrosion. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|--------------------------|

Inspections of Aboveground Pipes, Valves, and Pumps (6.8.4)

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 38. Regular inspections performed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 39. Flow valves periodically packed with grease, replace gaskets, rebuild pumps, and reseal lines | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 40. Leaking or defective devices are repaired or replaced. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 41. Repair records maintained in the SPCC Plan for a minimum of 3 years. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION 3

Warning Signs for Aboveground Pipes (6.8.5)

- 42. Drivers of vehicles at site have been warned of aboveground pipes in traffic areas.
- 43. Warning signs posted onsite regarding aboveground pipes.
- 44. Appropriate protection in loading and unloading areas protects aboveground pipes.

Yes	No	N/A	N/O
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

TANK CAR AND TANK TRUCK LOADING AND UNLOADING (6.9)

- 45. Loading and unloading is conducted in a manner to prevent spills.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------

SECURITY (6.10)

- 46. Full fencing, good lighting and locked or guarded gates provided.
- 47. Motion detectors and video cameras are provided for security.
- 48. Access is restricted to the facility during non-business hours.
- 49. Fuel pumps and valves have locking starter controls.
- 50. Loading and unloading connections and pipelines are capped or blank-flanged when not in use.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Attachment 6

Behavior Based Loss Prevention System Forms

Activity Hazard Analysis
Pre-Task Safety Plans
Loss Prevention Observation
Incident Report and Investigation

PRINT

SIGNATURE

Supervisor Name:

Date/Time: _____

Safety Officer Name:

Date/Time: _____

Employee Name(s):

Date/Time: _____

Project: _____ Location: _____ Date: _____
 Supervisor: _____ Emergency Number(s): _____

Brief Job Descriptions:
 1. _____
 2. _____
 3. _____
 4. _____
 5. _____

List Specific Tasks for the Jobs (Match number from above).
 1. _____
 2. _____
 3. _____
 4. _____
 5. _____

Tools/Equipment required for Tasks, (ladders, scaffolds, fall protection, cranes/rigging, heavy equipment, power tools)match number from above:
 1. _____
 2. _____
 3. _____
 4. _____
 5. _____

Potential H&S Hazards, including chemical, physical, safety, biological and environmental **(Check all that apply and review exposures as they will be encountered in the tasks above):**

<input type="checkbox"/> Chemical burns/contact	<input type="checkbox"/> Trench, excavations, cave-ins	<input type="checkbox"/> Ergonomics
<input type="checkbox"/> Pressurized lines/equipment	<input type="checkbox"/> Overexertion	<input type="checkbox"/> Chemical splash
<input type="checkbox"/> Thermal burns	<input type="checkbox"/> Pinch points	<input type="checkbox"/> Poisonous plants/insects
<input type="checkbox"/> Electrical	<input type="checkbox"/> Cuts/abrasions	<input type="checkbox"/> Eye hazards/flying projectile
<input type="checkbox"/> Weather conditions	<input type="checkbox"/> Spills	<input type="checkbox"/> Inhalation hazard
<input type="checkbox"/> Heights/fall > 6'	<input type="checkbox"/> Overhead Electrical hazards	<input type="checkbox"/> Heat/cold stress
<input type="checkbox"/> Noise	<input type="checkbox"/> Elevated loads	<input type="checkbox"/> Water/drowning hazard
<input type="checkbox"/> Explosion/fire	<input type="checkbox"/> Slips, trip and falls	<input type="checkbox"/> Heavy equipment
<input type="checkbox"/> Radiation	<input type="checkbox"/> Manual lifting	<input type="checkbox"/> Aerial lifts/platforms
<input type="checkbox"/> Confined space entry	<input type="checkbox"/> Welding/cutting	<input type="checkbox"/> Demolition

Other Potential Hazards (Describe):

Hazard Control Measures (Check all that apply):

<p>PPE</p> <ul style="list-style-type: none"> <input type="checkbox"/> Thermal/lined <input type="checkbox"/> Eye <input type="checkbox"/> Dermal/hand <input type="checkbox"/> Hearing <input type="checkbox"/> Respiratory <input type="checkbox"/> Reflective vests <input type="checkbox"/> Flotation device 	<p>Protective Systems</p> <ul style="list-style-type: none"> <input type="checkbox"/> Sloping <input type="checkbox"/> Shoring <input type="checkbox"/> Trench box <input type="checkbox"/> Barricades <input type="checkbox"/> Competent person <input type="checkbox"/> Locate buried utilities <input type="checkbox"/> Daily inspections 	<p>Fire Protection</p> <ul style="list-style-type: none"> <input type="checkbox"/> Fire extinguishers <input type="checkbox"/> Fire watch <input type="checkbox"/> Non-spark tools <input type="checkbox"/> Grounding/bonding <input type="checkbox"/> Intrinsically safe equipment 	<p>Electrical</p> <ul style="list-style-type: none"> <input type="checkbox"/> Lockout/tagout <input type="checkbox"/> Grounded <input type="checkbox"/> Panels covered <input type="checkbox"/> GFCI/extension cords <input type="checkbox"/> Power tools/cord inspected
<p>Fall Protection</p> <ul style="list-style-type: none"> <input type="checkbox"/> Harness/lanyards <input type="checkbox"/> Adequate anchorage <input type="checkbox"/> Guardrail system <input type="checkbox"/> Covered opening <input type="checkbox"/> Fixed barricades <input type="checkbox"/> Warning system 	<p>Air Monitoring</p> <ul style="list-style-type: none"> <input type="checkbox"/> PID/FID <input type="checkbox"/> Detector tubes <input type="checkbox"/> Radiation <input type="checkbox"/> Personnel sampling <input type="checkbox"/> LEL/O2 <input type="checkbox"/> Other 	<p>Proper Equipment</p> <ul style="list-style-type: none"> <input type="checkbox"/> Aerial lift/ladders/scaffolds <input type="checkbox"/> Forklift/ Heavy equipment <input type="checkbox"/> Backup alarms <input type="checkbox"/> Hand/power tools <input type="checkbox"/> Crane w/current inspection <input type="checkbox"/> Proper rigging <input type="checkbox"/> Operator qualified 	<p>Welding & Cutting</p> <ul style="list-style-type: none"> <input type="checkbox"/> Cylinders secured/capped <input type="checkbox"/> Cylinders separated/upright <input type="checkbox"/> Flash-back arrestors <input type="checkbox"/> No cylinders in CSE <input type="checkbox"/> Flame retardant clothing <input type="checkbox"/> Appropriate goggles
<p>Confined Space Entry</p> <ul style="list-style-type: none"> <input type="checkbox"/> Isolation <input type="checkbox"/> Air monitoring <input type="checkbox"/> Trained personnel <input type="checkbox"/> Permit completed <input type="checkbox"/> Rescue 	<p>Medical/ER</p> <ul style="list-style-type: none"> <input type="checkbox"/> First-aid kit <input type="checkbox"/> Eye wash <input type="checkbox"/> FA-CPR trained personnel <input type="checkbox"/> Route to hospital 	<p>Heat/Cold Stress</p> <ul style="list-style-type: none"> <input type="checkbox"/> Work/rest regime <input type="checkbox"/> Rest area <input type="checkbox"/> Liquids available <input type="checkbox"/> Monitoring <input type="checkbox"/> Training 	<p>Vehicle/Traffic</p> <ul style="list-style-type: none"> <input type="checkbox"/> Traffic control <input type="checkbox"/> Barricades <input type="checkbox"/> Flags <input type="checkbox"/> Signs
<p>Permits</p> <ul style="list-style-type: none"> <input type="checkbox"/> Hot work <input type="checkbox"/> Confined space <input type="checkbox"/> Lockout/tagout <input type="checkbox"/> Excavation <input type="checkbox"/> Demolition <input type="checkbox"/> Energized work 	<p>Demolition</p> <ul style="list-style-type: none"> <input type="checkbox"/> Pre-demolition survey <input type="checkbox"/> Structure condition <input type="checkbox"/> Isolate area/utilities <input type="checkbox"/> Competent person <input type="checkbox"/> Hazmat present 	<p>Inspections:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Ladders/aerial lifts <input type="checkbox"/> Lanyards/harness <input type="checkbox"/> Scaffolds <input type="checkbox"/> Heavy equipment <input type="checkbox"/> Cranes and rigging 	<p>Training:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Hazwaste <input type="checkbox"/> Construction <input type="checkbox"/> Competent person <input type="checkbox"/> Task-specific (THA) <input type="checkbox"/> Hazcom
<p>FieldNotes: _____</p> <p>_____</p>			

Supervisor signature: _____

Date: _____

Project: _____	Supervisor: _____	Date: _____
Task/Operation Observed: _____ _____ _____	Job Title of Worker Observed: _____ _____	
Background Information/comments: _____ _____ _____	Task Hazard Analysis completed for task (Y/N): _____	
Positive Observations/Safe Work Procedures 1. _____ 2. _____ 3. _____ 4. _____		
Questionable Activity/Unsafe Condition Observed 1. _____ 2. _____ 3. _____		
Observed Worker's Comment(s) 1. _____ 2. _____ 3. _____ 4. _____		
Supervisor's Corrective Actions Taken: 1. _____ 2. _____ 3. _____ 4. _____		

CH2MHILL

Loss Investigation Report Form

Employer Information

Company Name: _____

Project Name: _____ Project Number: _____

Project Location: _____

CHIL Project? Yes No

Task Location: _____

Job Assignment: _____ Business Group: _____

Preparer's Name: _____ Preparer's Employee Number: _____

Near Loss Incident Specific Information

Date of Incident: _____ Time of Incident: _____ a.m./p.m.

Location of incident:

Company premises

Field

In Transit

Other: _____

Address where the incident occurred: _____

Equipment Malfunction : Yes No

Activity was a Routine Task: Yes No

Describe any property damage: _____

Specific activity the employee was engaged in when the incident occurred: _____

All equipment, materials, or chemicals the employee was using when the incident occurred: _____

Describe the specific incident and how it occurred:

Describe how this incident may have been prevented:

Contributing Factors (Describe in detail why incident occurred):

Date employer notified of incident: _____ To whom reported: _____

Witness Information (First Witness)

Name: _____
Employee Number (for CH2M HILL employees): _____
Address: _____
City: _____
Zip Code : _____
Phone: _____

Witness Information (Second Witness)

Name: _____
Employee Number (for CH2M HILL employees): _____
Address: _____
City: _____
Zip Code: _____
Phone : _____
Additional information or comments: _____

COMPLETE ROOT CAUSE ANALYSIS FORM

Root Cause Analysis Form

Root Cause Analysis (RCA)

Lack of skill or knowledge Lack of or inadequate operational procedures or work standards Inadequate communication of expectations regarding procedures or work standards Inadequate tools or equipment	Correct way takes more time and/or requires more effort Short cutting standard procedures is positively reinforced or tolerated Person thinks there is no personal benefit to always doing the job according to standards Uncontrollable
--	---

RCA #	Solution(s): How to Prevent Loss From Occurring	RC ¹	CF ²	Corrective Action Lead	Due Date	Completion Date	Date Verified

¹ RC = Root Cause; ² CF = Contributing Factors (check which applies)

Investigation Team Members

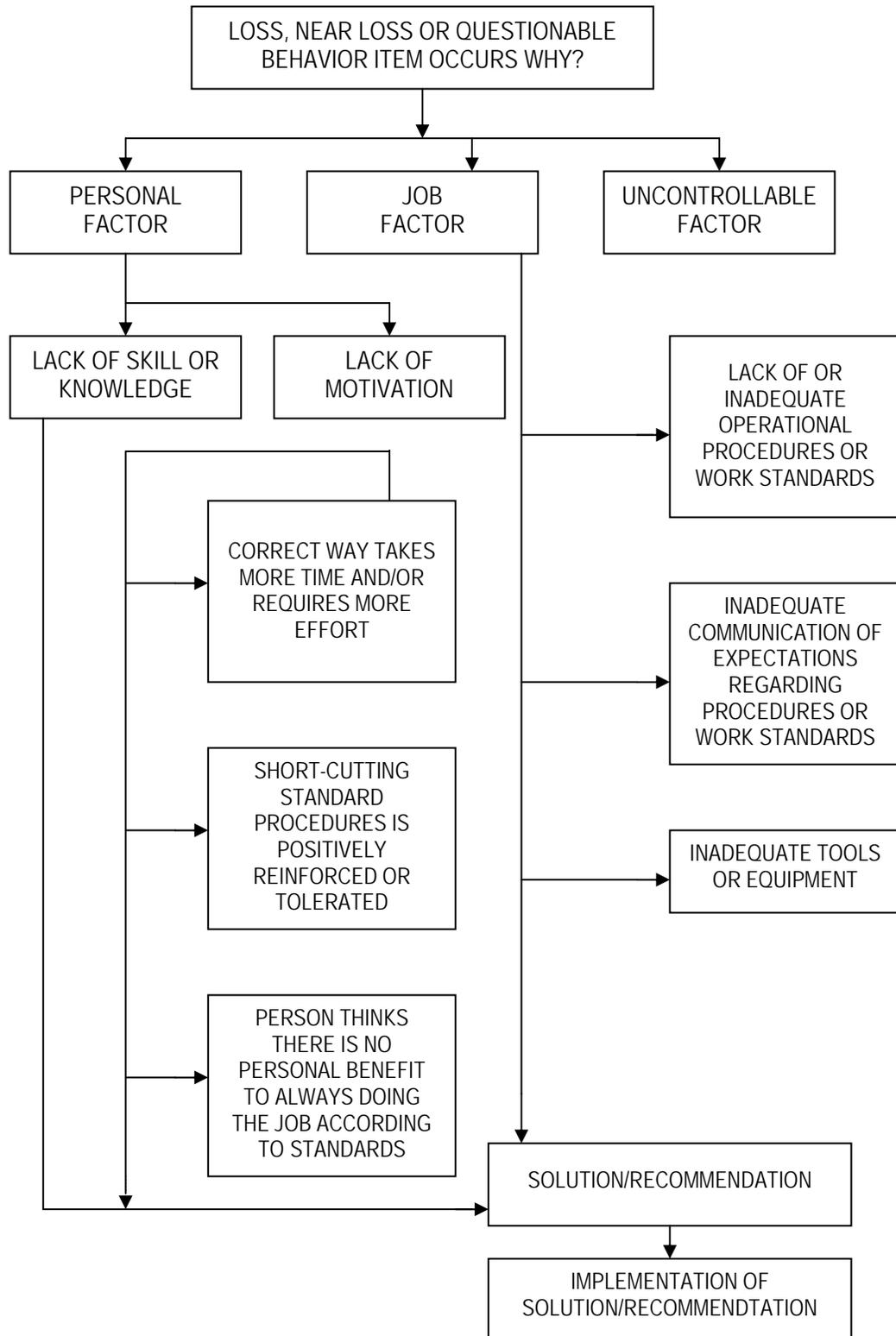
Name	Job Title	Date

Results of Solution Verification and Validation

Reviewed By

Name	Job Title	Date

Root Cause Analysis Flow Chart



Determination of Root Cause(s)

For minor losses or near losses the information may be gathered by the supervisor or other personnel immediately following the loss. Based on the complexity of the situation, this information may be all that is necessary to enable the investigation team to analyze the loss, to determine the root cause, and to develop recommendations. More complex situations may require the investigation team to revisit the loss site or re-interview key witnesses to obtain answers to questions that may arise during the investigation process.

Photographs or videotapes of the scene and damaged equipment should be taken from all sides and from various distances. This point is especially important when the investigation team will not be able to review the loss scene.

The investigation team must use the Root Cause Analysis Flow Chart to assist in identifying the root cause(s) of a loss. Any loss may have one or more "root causes" and "contributing factors". The "root cause" is the primary or immediate cause of the incident, while a "contributing factor" is a condition or event that contributes to the incident happening, but is not the primary cause of the incident. Root causes and contributing factors that relate to the *person* involved in the loss, his or her peers, or the supervisor should be referred to as "personal factors". Causes that pertain to the *system* within which the loss or injury occurred should be referred to as "job factors".

Personal Factors

Lack of skill or knowledge

Correct way takes more time and/or requires more effort

Short-cutting standard procedures is positively reinforced or tolerated

Person thinks that there is no personal benefit to always doing the job according to standards

Job Factors

Lack of or inadequate operational procedures or work standards.

Inadequate communication of expectations regarding procedures or standards

Inadequate tools or equipment

The root cause(s) could be any one or a combination of these seven possibilities or some other "uncontrollable factor". In the vast majority of losses, the root cause is very much related to one or more of these seven factors. Uncontrollable factors should be used rarely and only after a thorough review eliminates "all" seven other factors.

Incident Report Form

Fax completed form to:

425.462.5957

CH2M HILL Seattle Office

Attention: Corporate HS&E Department

Type of Incident (Select at least one)

- | | | |
|---|--|--|
| <input type="checkbox"/> Injury/Illness | <input type="checkbox"/> Property Damage | <input type="checkbox"/> Spill/Release |
| <input type="checkbox"/> Environmental/Permit Issue | <input type="checkbox"/> Near Miss | <input type="checkbox"/> Other |

General Information (Complete for all incident types)

Preparer's Name: _____ Preparer's Employee Number: _____
Date of Report: _____ Date of Incident: _____ Time of Incident: _____ am/pm

Type of Activity (Provide activity being performed that resulted in the incident)

- | | | |
|--|--|--|
| <input type="checkbox"/> Asbestos Work | <input type="checkbox"/> Excavation Trench-Haz Waste | <input type="checkbox"/> Other (Specify) _____ |
| <input type="checkbox"/> Confined Space Entry | <input type="checkbox"/> Excavation Trench-Non Haz | |
| <input type="checkbox"/> Construction Mgmt- Haz Waste | <input type="checkbox"/> Facility Walk Through | <input type="checkbox"/> Process Safety Management |
| <input type="checkbox"/> Construction Mgmt - Non-Haz Waste | <input type="checkbox"/> General Office Work | <input type="checkbox"/> Tunneling |
| <input type="checkbox"/> Demolition | <input type="checkbox"/> Keyboard Work | <input type="checkbox"/> Welding |
| <input type="checkbox"/> Drilling-Haz Waste | <input type="checkbox"/> Laboratory | <input type="checkbox"/> Wetlands Survey |
| <input type="checkbox"/> Drilling-Non Haz Waste | <input type="checkbox"/> Lead Abatement | <input type="checkbox"/> Working from Heights |
| <input type="checkbox"/> Drum Handling | <input type="checkbox"/> Motor Vehicle Operation | <input type="checkbox"/> Working in Roadways |
| <input type="checkbox"/> Electrical Work | <input type="checkbox"/> Moving Heavy Object | <input type="checkbox"/> WWTP Operation |

Location of Incident (Select one)

- Company Premises (CH2M HILL Office: _____)
- Field (Project #: _____ Project/Site Name: _____ Client: _____)
- In Transit (Traveling from: _____ Traveling to: _____)
- At Home

Geographic Location of Incident (Select region where the incident occurred)

- | | | |
|------------------------------------|------------------------------------|---|
| <input type="checkbox"/> Northeast | <input type="checkbox"/> Southwest | <input type="checkbox"/> Asia Pacific |
| <input type="checkbox"/> Southeast | <input type="checkbox"/> Corporate | <input type="checkbox"/> Europe Middle East |
| <input type="checkbox"/> Northwest | <input type="checkbox"/> Canadian | <input type="checkbox"/> Latin America |

If a CH2M HILL subcontractor was involved in the incident, provide their company name and phone number: _____

Describe the Incident (Provide a brief description of the incident): _____

Injured Employee Data (Complete for Injury/Illness incidents only)

If CH2M HILL employee injured

Employee Name: _____ Employee Number: _____

If CH2M HILL Subcontractor employee injured

Employee Name: _____ Company: _____

Injury Type

- | | | |
|--|--|---|
| <input type="checkbox"/> Allergic Reaction | <input type="checkbox"/> Electric Shock | <input type="checkbox"/> Multiple (Specify) _____ |
| <input type="checkbox"/> Amputation | <input type="checkbox"/> Foreign Body in eye | <input type="checkbox"/> Muscle Spasms |
| <input type="checkbox"/> Asphyxia | <input type="checkbox"/> Fracture | <input type="checkbox"/> Other (Specify) _____ |
| <input type="checkbox"/> Bruise/Contusion/Abrasion | <input type="checkbox"/> Freezing/Frost Bite | <input type="checkbox"/> Poisoning (Systemic) |
| <input type="checkbox"/> Burn (Chemical) | <input type="checkbox"/> Headache | <input type="checkbox"/> Puncture |
| <input type="checkbox"/> Burn/Scald (Heat) | <input type="checkbox"/> Hearing Loss | <input type="checkbox"/> Radiation Effects |
| <input type="checkbox"/> Cancer | <input type="checkbox"/> Heat Exhaustion | <input type="checkbox"/> Strain/Sprain |
| <input type="checkbox"/> Carpal Tunnel | <input type="checkbox"/> Hernia | <input type="checkbox"/> Tendonitis |
| <input type="checkbox"/> Concussion | <input type="checkbox"/> Infection | <input type="checkbox"/> Wrist Pain |
| <input type="checkbox"/> Cut/Laceration | <input type="checkbox"/> Irritation to eye | |
| <input type="checkbox"/> Dermatitis | <input type="checkbox"/> Ligament Damage | |
| <input type="checkbox"/> Dislocation | | |

Part of Body Injured

- | | | |
|--|---|--|
| <input type="checkbox"/> Abdomen | <input type="checkbox"/> Hand(s) | <input type="checkbox"/> Neck |
| <input type="checkbox"/> Ankle(s) | <input type="checkbox"/> Head | <input type="checkbox"/> Nervous System |
| <input type="checkbox"/> Arms (Multiple) | <input type="checkbox"/> Hip(s) | <input type="checkbox"/> Nose |
| <input type="checkbox"/> Back | <input type="checkbox"/> Kidney | <input type="checkbox"/> Other (Specify) _____ |
| <input type="checkbox"/> Blood | <input type="checkbox"/> Knee(s) | <input type="checkbox"/> Reproductive System |
| <input type="checkbox"/> Body System | <input type="checkbox"/> Leg(s) | <input type="checkbox"/> Shoulder(s) |
| <input type="checkbox"/> Buttocks | <input type="checkbox"/> Liver | <input type="checkbox"/> Throat |
| <input type="checkbox"/> Chest/Ribs | <input type="checkbox"/> Lower (arms) | <input type="checkbox"/> Toe(s) |
| <input type="checkbox"/> Ear(s) | <input type="checkbox"/> Lower (legs) | <input type="checkbox"/> Upper Arm(s) |
| <input type="checkbox"/> Elbow(s) | <input type="checkbox"/> Lung | <input type="checkbox"/> Upper Leg(s) |
| <input type="checkbox"/> Eye(s) | <input type="checkbox"/> Mind | <input type="checkbox"/> Wrist(s) |
| <input type="checkbox"/> Face | | |
| <input type="checkbox"/> Finger(s) | <input type="checkbox"/> Multiple (Specify) _____ | |
| <input type="checkbox"/> Foot/Feet | | |

Nature of Injury

- | | | |
|---|---|---|
| <input type="checkbox"/> Absorption | <input type="checkbox"/> Inhalation | <input type="checkbox"/> Overexertion |
| <input type="checkbox"/> Bite/Sting/Scratch | <input type="checkbox"/> Lifting | <input type="checkbox"/> Repeated Motion/Pressure |
| <input type="checkbox"/> Cardio-Vascular/Respiratory System Failure | <input type="checkbox"/> Mental Stress | <input type="checkbox"/> Rubbed/Abraded |
| <input type="checkbox"/> Caught In or Between | <input type="checkbox"/> Motor Vehicle Accident | <input type="checkbox"/> Shock |
| <input type="checkbox"/> Fall (From Elevation) | <input type="checkbox"/> Multiple (Specify) _____ | <input type="checkbox"/> Struck Against |
| <input type="checkbox"/> Fall (Same Level) | <input type="checkbox"/> Other (Specify) _____ | <input type="checkbox"/> Struck By |
| <input type="checkbox"/> Ingestion | | <input type="checkbox"/> Work Place Violence |

Initial Diagnosis/Treatment Date: _____

Type of Treatment

- | | |
|---|---|
| <input type="checkbox"/> Admission to hospital/medical facility | <input type="checkbox"/> Prescription- Single dose |
| <input type="checkbox"/> Application of bandages | <input type="checkbox"/> Removal of foreign bodies |
| <input type="checkbox"/> Cold/Heat Compression/Multiple Treatment | <input type="checkbox"/> Skin Removal |
| <input type="checkbox"/> Cold/Heat Compression/One Treatment | <input type="checkbox"/> Soaking therapy- Multiple Treatment |
| <input type="checkbox"/> First Degree Burn Treatment | <input type="checkbox"/> Soaking Therapy- One Treatment |
| <input type="checkbox"/> Heat Therapy/Multiple treatment | <input type="checkbox"/> Stitches/Sutures |
| <input type="checkbox"/> Multiple (Specify) _____ | <input type="checkbox"/> Tetanus |
| <input type="checkbox"/> Heat Therapy/One Treatment | <input type="checkbox"/> Treatment for infection |
| <input type="checkbox"/> Non-Prescriptive medicine | <input type="checkbox"/> Treatment of 2 nd /3 rd degree burns |
| <input type="checkbox"/> None | <input type="checkbox"/> Use of Antiseptics - multiple treatment |
| <input type="checkbox"/> Observation | <input type="checkbox"/> Use of Antiseptics - single treatment |
| <input type="checkbox"/> Other (Specify) _____ | <input type="checkbox"/> Whirlpool bath therapy/multiple treatment |
| <input type="checkbox"/> Prescription- Multiple dose | <input type="checkbox"/> Whirlpool therapy/single treatment |
| | <input type="checkbox"/> X-rays negative |
| | <input type="checkbox"/> X-rays positive/treatment of fracture |

Number of days doctor required employee to be off work: _____
Number of days doctor restricted employee's work activity: _____
Equipment Malfunction : Yes No Activity was a Routine Task: Yes No
Describe how you may have prevented this injury: _____

Physician Information

Name: _____
Address: _____
City: _____
Zip Code: _____
Phone: _____

Hospital Information

Name: _____
Address: _____
City: _____
Zip Code: _____
Phone: _____

Property Damage (Complete for Property Damage incidents only)

Property Damaged: _____ Property Owner: _____
Damage Description: _____
Estimated Amount: \$ _____

Spill or Release (Complete for Spill/Release incidents only)

Substance (attach MSDS): _____ Estimated Quantity: _____
Facility Name, Address, Phone No.: _____
Did the spill/release move off the property where work was performed?: _____
Spill/Release From: _____ Spill/Release To: _____

Environmental/Permit Issue (Complete for Environmental/Permit Issue incidents only)

Describe Environmental or Permit Issue: _____
Permit Type: _____
Permitted Level or Criteria (e.g., discharge limit): _____
Permit Name and Number (e.g., NPDES No. ST1234): _____
Substance and Estimated Quantity: _____
Duration of Permit Exceedence: _____

Verbal Notification (Complete for all incident types)(Provide names, dates and times)

CH2M HILL Personnel Notified: _____
Client Notified: _____

Witnesses (Complete for all incident types)

Witness Information (First Witness)

Name: _____
Employee Number (CH2M HILL): _____
Address: _____
City: _____
Zip Code: _____
Phone: _____

Witness Information (Second Witness)

Name: _____
Employee Number (CH2M HILL): _____
Address: _____
City: _____
Zip Code: _____
Phone : _____

Additional Comments:

NEAR LOSS INVESTIGATION FORM

Employer Information

Company Name: _____

Project Name: _____ Project Number: _____

Project Location: _____

CHIL Project? Yes No

Task Location: _____

Job Assignment: _____ Business Group: _____

Preparer's Name: _____ Preparer's Employee Number: _____

Near Loss Incident Specific Information

Date of Incident: _____ Time of Incident: _____ a.m./p.m.

Location of incident:

Company premises Field In Transit Other: _____

Address where the incident occurred: _____

Equipment Malfunction : Yes No Activity was a Routine Task: Yes No

Describe any property damage: _____

Specific activity the employee was engaged in when the incident occurred:

All equipment, materials, or chemicals the employee was using when the incident occurred:

Describe the specific incident and how it occurred:

Describe how this incident may have been prevented:

Contributing Factors (Describe in detail why incident occurred):

Date employer notified of incident: _____ To whom reported: _____

NEAR LOSS INVESTIGATION FORM

Witness Information (First Witness)

Name: _____

Employee Number (for CH2M HILL employees): _____

Address: _____

City: _____

Zip Code : _____

Phone: _____

Witness Information (Second Witness)

Name: _____

Employee Number (for CH2M HILL employees): _____

Address: _____

City: _____

Zip Code: _____

Phone : _____

Additional information or

comments: _____

Attachment 7

Applicable Material Safety Data Sheets
(available onsite)

Attachment 8

Subcontractor H&S Plans/Procedures

Appendix C

Quality Control Attachments



CH2M HILL
Northpark 400
1000 Abernathy Road
Suite 1600
Atlanta, GA 30328
Tel 770.604.9095
Fax 770.604.9282

January 22, 2008

Ms. Phyllis Zerangue
CH2M HILL, Inc.
1766 Sea Lark Lane
Navarre, Florida 32566-7472

RE: Contract No. N62467-01-D-0331
Contract Task Order No. 0019
Naval Air Station (NAS) Pensacola - Pensacola, Florida
Project Quality Control Manager Letter of Appointment

Dear Ms. Zerangue:

Herein describes the responsibilities and authority delegated to you in your capacity as the Project QC Manager at NAS Pensacola, Contract Task Order (CTO) 0019 under RAC Contract No. N62467-01-D-0331.

In this position, you assist and represent the Program QC Manager in continued implementation and enforcement of the Project QC Plans. Your primary role is to ensure all requirements of the contract are met. Consistent with this responsibility, you will: (i) implement the QC program as described in the Navy RAC contract; (ii) manage the site-specific QC requirements in accordance with the Project QC Plans; (iii) attend the coordination and mutual understanding meeting; (iv) conduct QC meetings; (v) oversee implementation of the three phases of control; (vi) perform submittal review and approval; (vii) ensure testing is performed; (viii) prepare QC certifications and documentation required in the Navy RAC Contract; and, (ix) furnish a Completion Certificate to the Contracting Officer or designated representative, upon completion of work under a contract task order, attesting that "the work has been completed, inspected, and tested, and is in compliance with the contract."

Your responsibilities further include identifying and reporting quality problems, rejecting nonconforming materials, initiating corrective actions, and recommending solutions for nonconforming activities.

You have the authority to control or stop further processing, delivery, or installation activities until satisfactory disposition and implementation of corrective actions are achieved. You have the authority to direct the correction of non-conforming work. All work requiring corrective action will be documented on daily reports, and, in the event non-conforming work is not immediately corrected you are required to submit a non-conformance report to the PM and copy the Program QC Manager. A status log will be kept of all non-conforming work. You shall immediately notify the Program QC Manager in the event of any stop work order.

It is imperative that you comply with all terms of the basic contract. In particular, Section C, Paragraph 6.5.2, which states:

"No work or testing may be performed unless the QC Program Manager or Project QC Manager is on the work site."

In the event that you are not able to be at the work site when work or testing is to be performed, it is your responsibility to inform the Program QC Manager and Project Manager, in advance, so that other arrangements can be made.

Further, if you are requested to perform the duties of the Site Supervisor, it is your responsibility to inform the Program QC Manager so that approval can be obtained in advance from the Contracting Officer or designated representative, in accordance with Section C Paragraph 6.6.2.1 of the contract.

You are a key member of the Project Manager's team. You ensure that work meets the specific requirements and intent of the work plan, the Navy's scope of work and the basic contract. Should you have any questions regarding this role, you should immediately contact the Program QC Manager, Theresa Rojas. Your day-to-day activities on the site should be coordinated with all site personnel and the Project Manager. In event of any deficient items, the Superintendent and Project Manager should be advised immediately so they have opportunity to remedy the situation.

Sincerely,

CH2M HILL Constructors, Inc.



Michael Halil
Deputy Program Manager

cc: Greg Wilfley/ATL
Eric Burrell/ATL
Project File No. 314252

CH2M HILL NAVFAC SOUTHEAST N62467-01-D-0331	CONTRACTOR PRODUCTION REPORT (ATTACH ADDITIONAL SHEETS IF NECESSARY)	DATE OF REPORT: REVISION NO: REVISION DATE:			
CTO NO: 0019	PROJECT NAME/LOCATION: Free Product Removal at UST 2406 - OLF Saufley, NAS Pensacola	REPORT NO:			
PROJECT NO: 314252	SUPERINTENDENT:	SITE H&S SPECIALIST:			
AM WEATHER:	PM WEATHER:	MAX TEMP: F MIN TEMP: F			
SUMMARY OF WORK PERFORMED TODAY					
JOB SAFETY	Was A Job Safety Meeting Held This Date? <input type="checkbox"/> Yes <input type="checkbox"/> No	TOTAL WORK HOURS ON JOB SITE THIS DATE (Including Continuation Sheets)			
	Were there any lost-time accidents this date? (If Yes, attach copy of completed OSHA report) <input type="checkbox"/> Yes <input type="checkbox"/> No	CH2MHILL On-Site Hours			
	Was a Confined Space Entry Permit Administered This Date? (If Yes, attach copy of each permit) <input type="checkbox"/> Yes <input type="checkbox"/> No	Subcontractor On-Site Hours			
	Was Crane/Manlift/Trenching/Scaffold/HV Elec/High Work/Hazmat Work Done?? (If Yes, attach statement or checklist showing inspection performed) <input type="checkbox"/> Yes <input type="checkbox"/> No	Subcontractor On-Site Hours			
	Was Hazardous Material/Waste Released into the Environment? (If Yes, attach description of incident and proposed action) <input type="checkbox"/> Yes <input type="checkbox"/> No	Total On-Site Hours This Date			
		Cumulative Total of Work Hours From Previous Report			
	Total Work Hours From Start of Construction				
SAFETY ACTIONS TAKEN TODAY/SAFETY INSPECTIONS CONDUCTED (Include Safety Violations, Corrective Instructions Given, Corrective Actions Taken, and Results of Safety Inspections Conducted):					
EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB					
DESCRIPTION OF EQUIPMENT/MATERIAL RECEIVED	MAKE/ MODEL/ MANUFACTURER	EQUIPMENT/ LOT NUMBER	INSPECTION PERFORMED BY	NUMBER/ VOLUME/ WEIGHT	
EQUIPMENT USED ON JOB SITE TODAY.					
EQUIPMENT DESCRIPTION	EQUIPMENT MAKE/MODEL	SAFETY CHECK PERFORMED BY	NUMBER OF HOURS		
			USED	IDLE	REPAIR
CHANGED CONDITIONS/DELAY/CONFLICTS ENCOUNTERED (List any conflicts with the delivery order [i.e., scope of work and/or drawings], delays to the project attributable to site and weather conditions, etc.):					
VISITORS TO THE SITE:					
LIST OF ATTACHMENTS (OSHA report, confined space entry permit, incident reports, etc.):					
SAFETY REQUIREMENTS HAVE BEEN MET <input type="checkbox"/>					
			_____ SUPERINTENDENT'S SIGNATURE	_____ DATE	

CH2M HILL SOUTH DIV RAC N62467-01-D-0331	CONTRACTOR QUALITY CONTROL REPORT (ATTACH ADDITIONAL SHEETS IF NECESSARY)	REPORT DATE: REVISION NO: REVISION DATE:		
CTO NO: 0019	PROJECT NAME/LOCATION: Free Product Removal at UST 2406 - OLF Saufley, NAS Pensacola y	REPORT NO:		
PROJECT NO: 314252	PROJECT QC MANAGER:	SITE H&S SPECIALIST:		
SAFETY MEETINGS AND INSPECTIONS				
WAS A SAFETY MEETING HELD THIS DAY?	<input type="checkbox"/> YES <input type="checkbox"/> NO	IF YES, ATTACH SAFETY MEETING MINUTES		
WAS CRANE USED ON THE SITE THIS DAY?	<input type="checkbox"/> YES <input type="checkbox"/> NO	IF YES, ATTACH DAILY CRANE REPORT OF INSPECTION AND CONTRACTOR CRANE OPERATION CHECKLIST		
DEFINABLE FEATURES OF WORK STATUS				
DFOW No.	Definable Feature Of Work	Preparatory	Initial	Follow-Up
1		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PREPARATORY	WAS PREPARATORY PHASE WORK PERFORMED TODAY? <input type="checkbox"/> YES <input type="checkbox"/> NO			
	IF YES, FILL OUT AND ATTACH SUPPLEMENTAL PREPARATORY PHASE CHECKLIST.			
	DFOW No.(from list above).	TASK/ACTIVITY	PREPARATORY PHASE REPORT NO.	
INITIAL AND FOLLOW-UP FEATURE OF WORK COMMENTS				
DFOW No.(from list above)	Phase	Comment/Finding/Action		
	Initial <input type="checkbox"/>			
	Follow up <input type="checkbox"/>			
	Initial <input type="checkbox"/>			
	Follow up <input type="checkbox"/>			
	Initial <input type="checkbox"/>			
	Follow up <input type="checkbox"/>			
	Initial <input type="checkbox"/>			
	Follow up <input type="checkbox"/>			
	Initial <input type="checkbox"/>			
	Follow up <input type="checkbox"/>			
	Initial <input type="checkbox"/>			
	Follow up <input type="checkbox"/>			
	Initial <input type="checkbox"/>			
	Follow up <input type="checkbox"/>			
REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)		REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST)		
TASK/ACTIVITY	DATE ISSUED	DESCRIPTION	TASK/ACTIVITY	CORRECTIVE ACTION(S) TAKEN

CH2M HILL SOUTH DIV RAC N62467-01-D-0331		CONTRACTOR QUALITY CONTROL REPORT (ATTACH ADDITIONAL SHEETS IF NECESSARY)				REPORT DATE: REVISION NO: REVISION DATE:			
CTO NO: 0071		PROJECT NAME/LOCATION: Remedial Action Plan, AOC 2, NSA Panama City				REPORT NO:			
PROJECT NO: 361560		PROJECT QC MANAGER:			SITE H&S SPECIALIST:				
SAMPLING/TESTING PERFORMED									
SAMPLING/TESTING PERFORMED				SAMPLING/TESTING COMPANY		SAMPLING/TESTING PERSONNEL			
MATERIALS/EQUIPMENT INSPECTION (Materials received and inspected against specifications)									
MATERIAL/EQUIPMENT DESCRIPTION			SPECIFICATION		MATERIAL ACCEPTED?		COMMENT/REASON/ACTION		
					YES <input type="checkbox"/> NO <input type="checkbox"/>				
					YES <input type="checkbox"/> NO <input type="checkbox"/>				
					YES <input type="checkbox"/> NO <input type="checkbox"/>				
					YES <input type="checkbox"/> NO <input type="checkbox"/>				
					YES <input type="checkbox"/> NO <input type="checkbox"/>				
					YES <input type="checkbox"/> NO <input type="checkbox"/>				
SUBMITTALS INSPECTION / REVIEW									
SUBMITTAL NO	SUBMITTAL DESCRIPTION		SPEC/PLAN REFERENCE		SUBMITTAL APPROVED?		COMMENT/REASON/ACTION		
					YES <input type="checkbox"/> NO <input type="checkbox"/>				
					YES <input type="checkbox"/> NO <input type="checkbox"/>				
					YES <input type="checkbox"/> NO <input type="checkbox"/>				
					YES <input type="checkbox"/> NO <input type="checkbox"/>				
OFF-SITE SURVEILLANCE ACTIVITIES, INCLUDING ACTIONS TAKEN:									
ACCUMULATION/STOCKPILE AREA INSPECTION									
INSPECTION PERFORMED BY:					SIGNATURE OF INSPECTOR:				
ACCUMULATION/ STOCKPILE AREA LOCATION									
NO OF CONTAINERS:		NO OF TANKS:		NO OF ROLL-OFF BOXES:		NO OF DRUMS:			
INSPECTION RESULTS:									
TRANSPORTATION AND DISPOSAL ACTIVITIES/SUMMARY/QUANTITIES:									
GENERAL COMMENTS (rework, directives, etc.):									
LIST OF ATTACHMENTS (examples, as applicable: preparatory phase checklist, QC meeting minutes, safety meeting minutes, crane inspections, crane operation checklist, COCs, weight tickets, manifests, profiles, rework item list, testing plan and log, etc.):									
<p><i>On behalf of the contractor, I certify that this report is complete and correct and equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.</i></p>									
						PROJECT QC MANAGER'S SIGNATURE		DATE	
<p><i>On behalf of the contractor, I attest that the work for which payment is requested, including stored material, is in compliance with contract requirements.</i></p>									
						PROJECT QC MANAGER'S SIGNATURE		DATE	

Submittal Register

Contract Number: N62467-01-D-0331		CTO No.: 0019			CTO Title: Free Product Removal at UST 2406					Location: OLF Saufley, NAS Pensacola			Contractor: CH2M HILL Constructors, Inc.			
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Spec Section	Item Description	Para. Number	Approving Authority	Other Reviewers	Submittal Number	Scheduled Submission Date	CCI Review Date	CCI Disposition	CCI Transmit Date	QC Admin Received Date	QC Disposition	QC Admin Transmit Date	Contracting Officer Received	Contracting Officer Disposition	Contracting Officer Return	Remarks
SD-07	Schedules															
	Project Schedule															
SD-09	Reports															
	Project Completion Report															
	Environmental Conditions Report															
	Analytical Reports															
	Well Completion															
SD-13	Certificates															
	Analytical Laboratory Certification															
	Disposal Facility Permit															
	Transporter Permit															
	Well Driller License															
SD-18	Records															
	Headspace Screening Results															
	Contaminated Soil/Water Disposal Profile															
	Contaminated Soil/Water Disposal Manifests															
	List of Contractor Personnel															
	Contractor Production Reports															
	Contractor QC Reports															
	Transportation and Disposal Log															
	Testing Plan and Log															
	Monthly Summary Report of Field Tests															

