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Naval Air Station (NAS) Jacksonville
Jacksonville, Florida

Re: Site Assessment Work Plan for the Petroleum Contaminated Area 4, Gas Hill Fuel Farm

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Site Assessment Work Plan

Petroleum Contaminated Area 4 Gas Hill Fuel Farm

Naval Air Station Jacksonville Jacksonville, Florida

Contract No. N62467-01-D-0331
Contract Task Order No. 0072

Submitted to:



U.S. Naval Facilities
Engineering Command Southeast

Prepared by:



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February 2008

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February 6, 2008

Date

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Date

Client Acceptance:

U.S. Navy Responsible Authority

Date



PROFESSIONAL CERTIFICATION

The contractor, CH2M HILL Constructors, Inc., hereby certifies that, to the best of its knowledge and belief, this Work Plan and the technical data, delivered herewith under Contract No. N62467-01-D-0331, Contract Task Order No. 0072 is complete and accurate and complies with all requirements of this contract and standard professional practices at the time the submittal was prepared. This document was prepared under the supervision of the signing Professional Engineer and is partly based on information obtained from others. If conditions are determined to exist differently than those described in this document, then the undersigned Professional Engineer should be notified to evaluate the effects of any additional information on the project described in this document.

DATE: _____

NAME AND TITLE OF CERTIFYING OFFICIAL: _____

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Project Manager
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Expiration Date: February 28, 2009

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 - Summary of Field Tests Log
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 - Contractor Daily Production Report
 - Contractor Daily Quality Control Report
 - Preparatory Phase Report
 - Submittal Register
 - Testing Plan and Log
- D Environmental Conditions Report Photo Log

Acronyms and Abbreviations

ACO	Administrative Contracting Officer
AFCEE	Air Force Center for Engineering and the Environment
AHA	Activity Hazard Analysis
bgs	Below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CFR	Code of Federal Regulations
CH2M HILL	CH2M HILL Constructors, Inc.
CO	Contracting Officer
COC	chain-of-custody
COTR	Contracting Officer's Technical Representative
CTO	Contract Task Order
DPT	direct push technology
DO	dissolved oxygen
DOT	U.S. Department of Transportation
EISOPQAM	Environmental Investigative Standard Operating Procedures and Quality Assurance Manual (EPA)
EPA	U.S. Environmental Protection Agency
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FID	flame ionization detector
FL PRO	Florida Petroleum Residual Organic
GCTLs	Groundwater Cleanup Target Levels
HSA	hollow stem auger
HSP	Health and Safety Plan
HCl	hydrochloric acid
µg/L	micrograms per liter
IR CDQM	Installation Restoration Chemical Data Quality Manual (Navy)
L/min	liters per minute
LNAPL	light non-aqueous phase liquid
LDR	land disposal restriction
mg/kg	milligrams per kilogram
mL	milliliter
MNA	Monitored natural attenuation
MS/MSD	matrix spike/matrix spike duplicate
NaOH	sodium hydroxide
NAS	Naval Air Station
NAVFACE	U.S. Naval Facilities Engineering Command Southeast
NTR	Navy Technical Representative
ORC®	Oxygen Release Compound
ORP	oxygen reduction potential
oz	ounce
PAHs	polynuclear aromatic hydrocarbons
PCA	Petroleum Contaminated Area
PPE	personal protective equipment

PVC	polyvinyl chloride
QA	Quality Assurance
QC	Quality Control
QCP	Quality Control Plan
RAC	Response Action Contract
RAP	Remedial Action Plan
RPM	Remedial Project Manager
SAP	Sampling and Analysis Plan
SAR	Site Assessment Report
SCTLs	Soil Cleanup Target levels
SOP	standard operation procedures
H ₂ SO ₄	sulfuric acid
T&D	transportation and disposal
TAL	target analyte list
TAT	turnaround time
TCL	target compound list
TN&A	TN & Associates
TPH	total petroleum hydrocarbons
TtNUS	Tetra Tech NUS, Inc.
USTs	underground storage tanks
USACE	U.S. Army Corps of Engineers
VOA	volatile organic analysis
VOCs	volatile organic compounds

1.0 Introduction

CH2M HILL Constructors, Inc. (CH2M HILL) has been contracted by the U.S. Naval Facilities Engineering Command Southeast (NAVFAC SE), to prepare this Site Assessment Work Plan under Response Action Contract (RAC) No. N62467-01-D-0331, Contract Task Order (CTO) No. 0072. The Site Assessment Work Plan presents the scope of work that will be implemented to further define the extent of hydrocarbons in the soil and groundwater resulting from past fuel storage activities at the former location of the Gas Hill Fuel Farm, Petroleum Contaminated Area (PCA) 4 at Naval Air Station (NAS) Jacksonville, Jacksonville, Florida. The newly acquired data coupled with data obtained from previous environmental work will be used to prepare both a Site Assessment Report (SAR) and Remedial Action Plan (RAP) for the site.

This Site Assessment Work Plan is organized into seven sections and four appendices as follows:

Section 1.0 Introduction. This section describes the history of the site and provides a summary of key site assessment and tank removal activities. In addition, the results of the limited assessment work that was performed in August 2007 are also presented in this section. These results, coupled with the historical test data, provide the basis for development of the work scope described in Section 2.0 of this Site Assessment Work Plan.

Section 2.0 Project Execution Plan. The scope of work to further define the extent of hydrocarbons in the soil and groundwater is described in Section 2.0. Project schedule and project reporting requirements are also included in this section.

Section 3.0 Sampling and Analysis Plan (SAP). This section details the sampling procedures that will be followed during execution of the work scope described in Section 2.0. Topics such as sampling methodology, sample collection frequency, laboratory analytical methods, and quality assurance (QA)/quality control (QC) sampling are discussed. The test methodology presented in Section 3.0 conforms to the standards promulgated by the Florida Department of Environmental Protection (FDEP) and U.S. Environmental Protection Agency (EPA).

Section 4.0 Waste Management Plan. This section presents waste management practices that will be maintained during completion of the additional assessment work including handling, transportation, and disposal of non hazardous or, if necessary, hazardous waste.

Section 5.0 Environmental Protection Plan. This section contains site-specific environmental provisions for the prevention of spills and for spill and erosion control.

Section 6.0 Quality Control Plan. This section includes the testing requirements for work described in this Site Assessment Work Plan. The site specific project organization for this CTO is also included in this section. All other QC information is contained in the NAS Jacksonville Basewide Work Plan (CH2M HILL, 2000).

Section 7.0 References. This section lists the references used to prepare this document.

Appendix A contains the Health and Safety Plan (HSP).

Appendix B contains the project schedule.

Appendix C contains the project QC documents (i.e., submittal register, testing plan and log, etc.).

Appendix D presents site photographs from the environmental conditions report.

1.1 Site Description

Gas Hill Fuel Farm is located in the northeastern portion of NAS Jacksonville, Florida (Figure 1-1). According to the U.S. Army Corps of Engineers (USACE) (1992), fuel storage operations began in 1943 and continued until 2001. In 2001, fuel storage at the Gas Hill Fuel Farm was discontinued because a new fuel facility was installed near Hangar 1000. Historical records indicate 15 underground storage tanks (USTs) (Tanks A through O) were used during the fuel farm's operational history. Tanks J and K (small capacity steel tanks containing diesel fuel) were removed prior to 1980 because of suspected leaks.

During fuel farm closure activities, approximately 760 gallons of JP-5 was released at a valve flange and filled an unlined valve box. Approximately 20 gallons overflowed into the vegetative surface. A vacuum truck recovered the 760 gallons of JP-5 from the valve box and the contaminated soil was containerized in 55-gallon drums (Sigona, 2000). The release was reported to the FDEP.

In 2006, the 13 remaining tanks and approximately 1,300 tons of petroleum-impacted soil surrounding Tanks A through D were removed by TN & Associates (TN&A) (TN&A, 2006). The footprint of the Gas Hill Fuel Farm showing the former location of the USTs is shown on Figure 1-2.

Over the course of facility operation, numerous investigations were performed to determine the extent of hydrocarbons in the soil and groundwater at the Gas Hill Tank Farm. The results of the Tetra Tech NUS, Inc. pre-excavation assessment (TtNUS, 2005); TN&A tank removal work (TN&A, 2006); and the most-recent limited site assessment completed in August 2007 are described below.

1.1.1 Pre-Excavation Assessment and Limited Remediation

In 2005, TtNUS performed a pre-excavation assessment to determine the vertical and horizontal extent of hydrocarbons in the soil and groundwater within the Gas Hill Fuel Farm, and to estimate the volume of impacted soil that required removal. TtNUS estimated approximately 49,000 cubic yards (about 78,400 tons) of impacted soil required removal within the tank farm, and encountered light non-aqueous phase hydrocarbons (LNAPL) during the assessment activities (TtNUS, 2005a). The investigation also concluded that most of the impacted soil occurred within the fenced area of the tank farm, and was present below the water table.

Groundwater quality results obtained from wells installed along the periphery of the tank farm indicated little hydrocarbon contamination was present outside the area formerly occupied by the USTs; the one exception was the occurrence of dissolved benzene

contamination in wells located along the southern edge of the property. As a result, TtNUS injected Oxygen Release Compound (ORC®) into the soil and groundwater to reduce offsite concentrations of dissolved hydrocarbons in groundwater along the southern/southeastern edge of the fuel farm. However, due to repeated rebound in dissolved hydrocarbon concentrations following the injection of ORC®, TtNUS concluded that UST removal and source area treatment were needed before resuming additional ORC® injections (TtNUS, 2005b).

1.1.2 UST Removal

Between February and May 2006, TN&A removed 13 USTs (Tanks A, B, C, D, E, F, G, H, I, L, M, N, and O), and excavated approximately 1,300 tons of impacted soil from the area formerly occupied by Tanks A through D. Upon removal, approximately 125 pounds of ORC® were added to the excavation areas for Tanks A, B, C, and D. The excavation areas were subsequently backfilled with remaining onsite soil and hydro-seeded.

On August 9, 2006, during cleaning of four 60-year abandoned fuel lines under the runway and near the southeast corner of the fuel farm, approximately 500 gallons of jet fuel/water mixture was released. The fuel/water spill, reported to the FDEP on a discharge report form (Sigona, 2006), was removed using a vacuum truck.

Of the 49,000 cubic yards (78,400 tons) of petroleum-impacted soil calculated by TtNUS as requiring removal, only 1,300 tons were transported offsite for disposal. Given the large discrepancy in actual versus calculated soil volumes and because no confirmation soil samples were collected from the floor and sidewalls of the excavation, it is not possible to ascertain from the report (TN&A, 2006) if tank removal and removal of 1,300 tons of impacted soil were sufficient for the site to be considered for no further action under current or future land use. For these reasons, CH2M HILL recommended the completion of additional assessment work to determine if hydrocarbons were present following the tank removal and soil excavation work.

On July 6, 2007, CH2M HILL contacted TN&A personnel who worked on the 2006 excavation project to discuss the work performed. Based on the call, CH2M HILL verified that confirmation samples were not collected from the floor and sidewalls of the excavation, but rather were taken from the unsaturated soil surrounding each UST. TN&A also indicated that LNAPL was encountered in some of the tank excavations, but LNAPL recovery was not performed.

1.1.3 Limited Site Assessment Results

On July 11, 2007, CH2M HILL performed a site visit to evaluate site conditions. Our evaluation indicated that the site, following the 2006 excavation activities, was graded to a mound that is approximately 10 feet above the surrounding area. The surface of the mound is covered with tall grass, and the locations of the former tank locations could not be identified. CH2M HILL also observed that all previous monitoring wells installed inside the fuel farm were destroyed during the excavation work; however, several peripheral groundwater monitoring wells were identified along an access road that abuts the perimeter of the former tank farm.

Following the site visit, CH2M HILL recommended a limited soil and groundwater investigation to evaluate whether residual hydrocarbon contamination was present in the soil and groundwater in areas of the site previously occupied by the USTs, and in areas of the site where LNAPL was historically detected. TtNUS performed the following tasks to achieve these objectives:

- Sixteen soil borings (SB01 through SB16) were advanced in areas of the site most likely to contain residual hydrocarbon contamination. One soil sample from each boring was collected and analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) and naphthalene by EPA Method 8260B, polynuclear aromatic hydrocarbons (PAHs), including 1- and 2-methylnaphthalene by EPA Method 8270C, and total petroleum hydrocarbons (TPH) by the Florida Petroleum Residual Organic (FL-PRO) Method.
- Five surface soil (0 to 2 feet below ground surface [bgs]) samples were collected. The results were compared to commercial/industrial and residential soil cleanup target levels (SCTLs) for direct exposure risk and to leachability SCTLs to evaluate the leaching potential of contaminants to groundwater. Refer to Table 2 of the *Final Technical Report: Development of Cleanup Target Levels for Chapter 62-777* (FDEP, 2005).
- Eleven soil samples in the unsaturated zone below the surface soil (0- to 2-foot) interval were collected. The results were compared to leachability SCTLs, which are listed in Table 2 of the *Final Technical Report: Development of Cleanup Target Levels for Chapter 62-777* (FDEP, 2005).
- Eight 1-inch diameter, temporary monitoring wells were installed in soil borings SB02, SB05, SB07, SB10, SB12, SB15, SB16, and TMW01 to test for the presence of LNAPL and to evaluate the magnitude and extent of petroleum hydrocarbon contamination in groundwater. The temporary monitoring well locations are shown on Figure 1-2.
- Groundwater samples collected from the temporary monitoring wells were analyzed for BTEX and naphthalene by EPA Method 8260B, PAHs (including 1- and 2-methylnaphthalene) by EPA Method 8270C, and TPH by the FL-PRO Method. The results were compared to the groundwater cleanup target levels (GCTLs) and FDEP Natural Attenuation Default Concentrations. These regulatory levels are listed in Table 2 of the *Final Technical Report: Development of Cleanup Target Levels for Chapter 62-777* (FDEP, 2005).

The major findings obtained from the limited site assessment are described below.

1.2 Soil Sample Results

Analytical results from the five surface soil samples (0 to 2 feet bgs) indicate all of the constituents (BTEX, PAHs, and TPH) were detected below both the commercial/industrial and residential SCTLs (Table 1-1). The results for all 16 soil samples were then compared to leachability SCTLs to evaluate the leaching potential of the detected compounds to groundwater. Compounds m- and p-xylenes, naphthalene, and TPH exceeded their respective leachability SCTL (Table 1-2). As shown on Figure 1-3, locations that exceeded the leachability SCTLs were as follows:

- Naphthalene: SB02, SB05, SB10, and SB15
- TPH: SB02, SB05, SB07, SB10, and SB15
- M- and p-xylenes: SB02



-  Facility Boundary
-  Gas Hill Fuel Farm Boundary

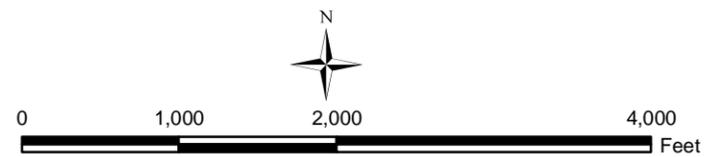


FIGURE 1-1
Site Location
Gas Hill Fuel Farm
Naval Air Station Florida
Jacksonville, Florida



- Soil Boring Location
- Former Tank Location
- Soil Boring/ Temporary Monitoring Well Location
- Gas Hill Fuel Farm
- ⊕ Temporary Monitoring Well Location
- ⊕ Monitoring Well Location

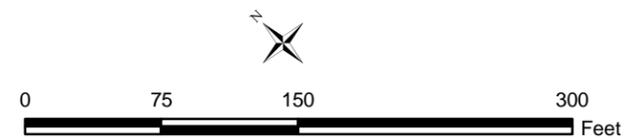
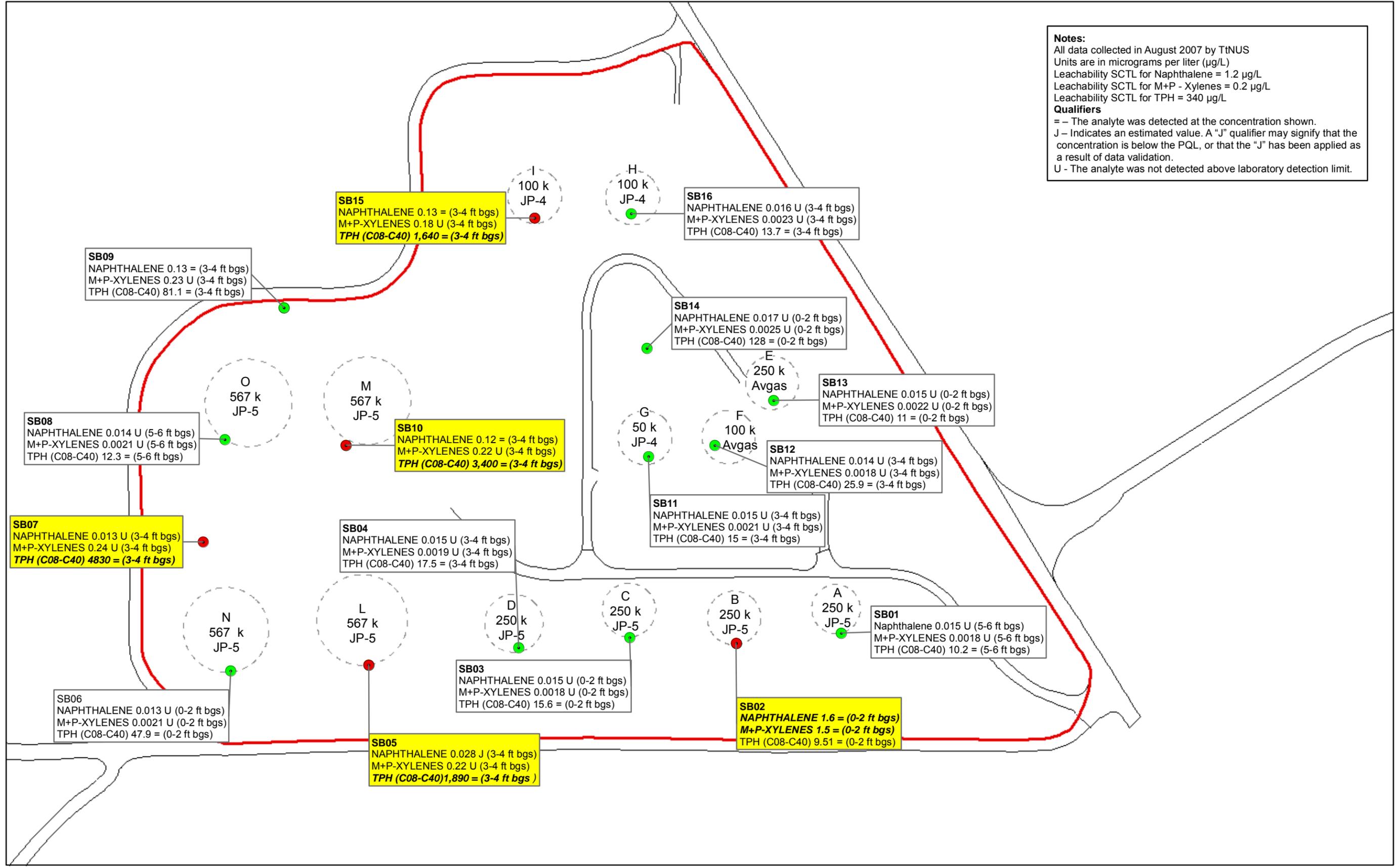


FIGURE 1-2
 Site Plan
 Gas Hill Fuel Farm
 NAS, Jacksonville, Florida

Notes:
 All data collected in August 2007 by TtNUS
 Units are in micrograms per liter (µg/L)
 Leachability SCTL for Naphthalene = 1.2 µg/L
 Leachability SCTL for M+P - Xylenes = 0.2 µg/L
 Leachability SCTL for TPH = 340 µg/L

Qualifiers
 = - The analyte was detected at the concentration shown.
 J - Indicates an estimated value. A "J" qualifier may signify that the concentration is below the PQL, or that the "J" has been applied as a result of data validation.
 U - The analyte was not detected above laboratory detection limit.



● Soil Sample Location > Leachability SCTL
 ● Soil Sample Location < Leachability SCTL
 — Road Curb Line
 — Site Boundary

○ Former Tank Location

Yellow label indicates an exceedance; exceedances are **bolded and italicized**

SB03
 NAPHTHALENE 0.015 U (0-2 ft bgs)
 M+P-XYLENES 0.0018 U (0-2 ft bgs)
 TPH (C08-C40) 15.6 = (0-2 ft bgs)

Station Identification
 1-Naphthalene Concentration + Qualifier + Depth
 M+P - Xylenes Concentration + Qualifier + Depth
 TPH (C08-C40) Concentration + Qualifier + Depth

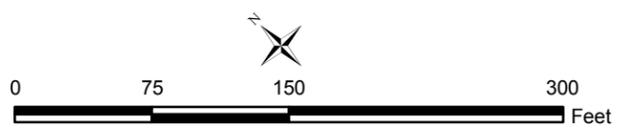


FIGURE 1-3
 1-Naphthalene, M+P - Xylenes,
 TPH (C08-C40) in Surface and Subsurface Soil
 Gas Hill Fuel Farm
 NAS, Jacksonville, Florida

TABLE 1-1
 Surface Soil Statistical Data Summary
 Gas Hill Fuel Farm, Naval Air Station Jacksonville
 Jacksonville, Florida

Parameter Name	Number of Sample	Number of Detects	Units	Minimum Concentration	Maximum Concentration	Commercial/ Industrial SCTL	Exceed Commercial/ Industrial SCTL	Residential SCTL	Exceed - Residential SCTL	Maximum Concentration Location	Minimum Concentration Location
1-Methylnaphthalene	5	1	mg/kg	2.50E+00	2.50E+00	1.80E+03	0	2.00E+02	0	SB02	SB02
2-Methylnaphthalene	5	2	mg/kg	1.90E-02 J	3.50E+00	2.10E+03	0	2.10E+02	0	SB02	SB14
Benzo(a)anthracene	5	1	mg/kg	2.80E-02 J	2.80E-02 J	NA		NA		SB14	SB14
Benzo(a)pyrene	5	1	mg/kg	1.90E-02 J	1.90E-02 J	7.00E-01	0	1.00E-01	0	SB14	SB14
Benzo(b)fluoranthene	5	1	mg/kg	2.40E-02 J	2.40E-02 J	NA		NA		SB14	SB14
Benzo(g,h,i)perylene	5	2	mg/kg	1.10E-01	1.40E-01	5.20E+04	0	2.50E+03	0	SB14	SB06
Chrysene	5	1	mg/kg	1.40E-02 J	1.40E-02 J	NA		NA		SB14	SB14
Fluoranthene	5	1	mg/kg	5.20E-02	5.20E-02	5.90E+04	0	3.20E+03	0	SB14	SB14
Fluorene	5	1	mg/kg	4.20E-02	4.20E-02	3.30E+04	0	2.60E+03	0	SB02	SB02
Indeno(1,2,3-cd)pyrene	5	2	mg/kg	1.20E-01	1.50E-01	NA		NA		SB14	SB06
Naphthalene	5	1	mg/kg	1.60E+00	1.60E+00	3.00E+02	0	5.50E+01	0	SB02	SB02
Phenanthrene	5	1	mg/kg	1.50E-02 J	1.50E-02 J	3.60E+04	0	2.20E+03	0	SB02	SB02
Pyrene	5	1	mg/kg	7.10E-02	7.10E-02	4.50E+04	0	2.40E+03	0	SB14	SB14
M- and p-Xylenes	5	1	mg/kg	1.50E+00	1.50E+00	7.00E+02	0	1.30E+02	0	SB02	SB02
TPH (C08-C40)	5	5	mg/kg	9.51E+00	1.28E+02	2.70E+03	0	4.60E+02	0	SB14	SB02

mg/kg – milligrams per kilogram
 SCTL – soil cleanup target level

TABLE 1-2
 Leachability Soil Statistical Data Summary
 Gas Hill Fuel Farm, Naval Air Station Jacksonville
 Jacksonville, Florida

Parameter Name	Number of Samples	Number of Detects	Units	Minimum Concentration	Maximum Concentration	Leachability SCTL	Exceed Leachability SCTL	Maximum Concentration Location	Minimum Concentration Location
1-Methylnaphthalene	16	5	mg/kg	1.90E-01	2.50E+00	3.10E+00	0	SB02, SB15	SB05
2-Methylnaphthalene	16	6	mg/kg	1.90E-02 J	3.50E+00	8.50E+00	0	SB02	SB14
Acenaphthene	16	3	mg/kg	6.00E-02	2.10E-01	2.10E+00	0	SB10	SB05
Anthracene	16	3	mg/kg	2.00E-02 J	1.30E-01	2.50E+03	0	SB15	SB05
Benzo(a)anthracene	16	6	mg/kg	1.30E-02 J	2.50E-01	8.00E-01	0	SB15	SB16
Benzo(a)pyrene	16	6	mg/kg	1.10E-02 J	2.10E-01	8.00E+00	0	SB15	SB07
Benzo(b)fluoranthene	16	7	mg/kg	1.40E-02 J	2.90E-01	2.40E+00	0	SB15	SB07
Benzo(g,h,i)perylene	16	8	mg/kg	1.00E-01	2.00E-01	3.20E+04	0	SB15	SB07
Benzo(k)fluoranthene	16	4	mg/kg	1.20E-02 J	9.90E-02	2.40E+01	0	SB15	SB11
Chrysene	16	4	mg/kg	1.40E-02 J	2.20E-01	7.70E+01	0	SB15	SB14
Dibenzo(a,h)anthracene	16	3	mg/kg	1.20E-01	1.40E-01	7.00E-01	0	SB05	SB10
Fluoranthene	16	5	mg/kg	5.20E-02	7.50E-01	1.20E+03	0	SB15	SB14
Fluorene	16	5	mg/kg	1.60E-02 J	1.10E-01	1.60E+02	0	SB10, SB15	SB09
Indeno(1,2,3-cd)pyrene	16	8	mg/kg	1.10E-01	1.90E-01	6.60E+00	0	SB15	SB07
Naphthalene	16	5	mg/kg	2.80E-02 J	1.60E+00	1.20E+00	1	SB02	SB05
Phenanthrene	16	5	mg/kg	1.50E-02 J	4.50E-01	2.50E+02	0	SB15	SB02
Pyrene	16	6	mg/kg	5.30E-02	7.00E-01	8.80E+02	0	SB05	SB09
M- and p-Xylenes	16	1	mg/kg	1.50E+00	1.50E+00	2.00E-01	1	SB02	SB02
TPH (C08-C40)	16	16	mg/kg	9.51E+00	4.83E+03	3.40E+02	4	SB07	SB02

mg/kg – milligrams per kilogram
 SCTL – soil cleanup target level

1.3 Groundwater Results

LNAPL was not detected in any of the eight temporary monitoring wells; therefore, groundwater samples were collected from each well for chemical analysis. Compounds 1-methylanphthalene, benzo(a)anthracene, benzene, m- and p-xylenes, and TPH were detected above their respective GCTLs. Table 1-3 presents the statistical summary of the detected constituents in groundwater and provides the number of exceedances when compared to the GCTL and FDEP Natural Attenuation Default Concentration. Benzene was the only compound that exceeded the FDEP Natural Attenuation Default Concentration. Figure 1-4 shows the groundwater contaminant plume and ORC® injection points.

The results of the limited site investigation indicate that low levels of hydrocarbons are present within the area formerly occupied by the Gas Hill Fuel Farm. However, given the size of the area, additional testing is necessary to evaluate contaminant extent and determine whether hot spots are present that may act as a continuing source of contamination.

1.4 Project Objectives

Additional investigation activities will be performed to further define the extent of hydrocarbons in the soil and groundwater resulting from past fuel storage activities at the former location of the Gas Hill Fuel Farm. The newly acquired data as well as data obtained from previous environmental work will be used to prepare both a SAR and RAP for the site. Based on the low levels of hydrocarbons detected following the recent work (August 2007), it is possible that monitored natural attenuation (MNA) alone may be a viable remedial alternative for the site. Alternatively, additional remediation (i.e., hot spot removal, air sparging, etc.) may be required depending on the results obtained during execution of the work described in Section 2.0 of this Site Assessment Work Plan.

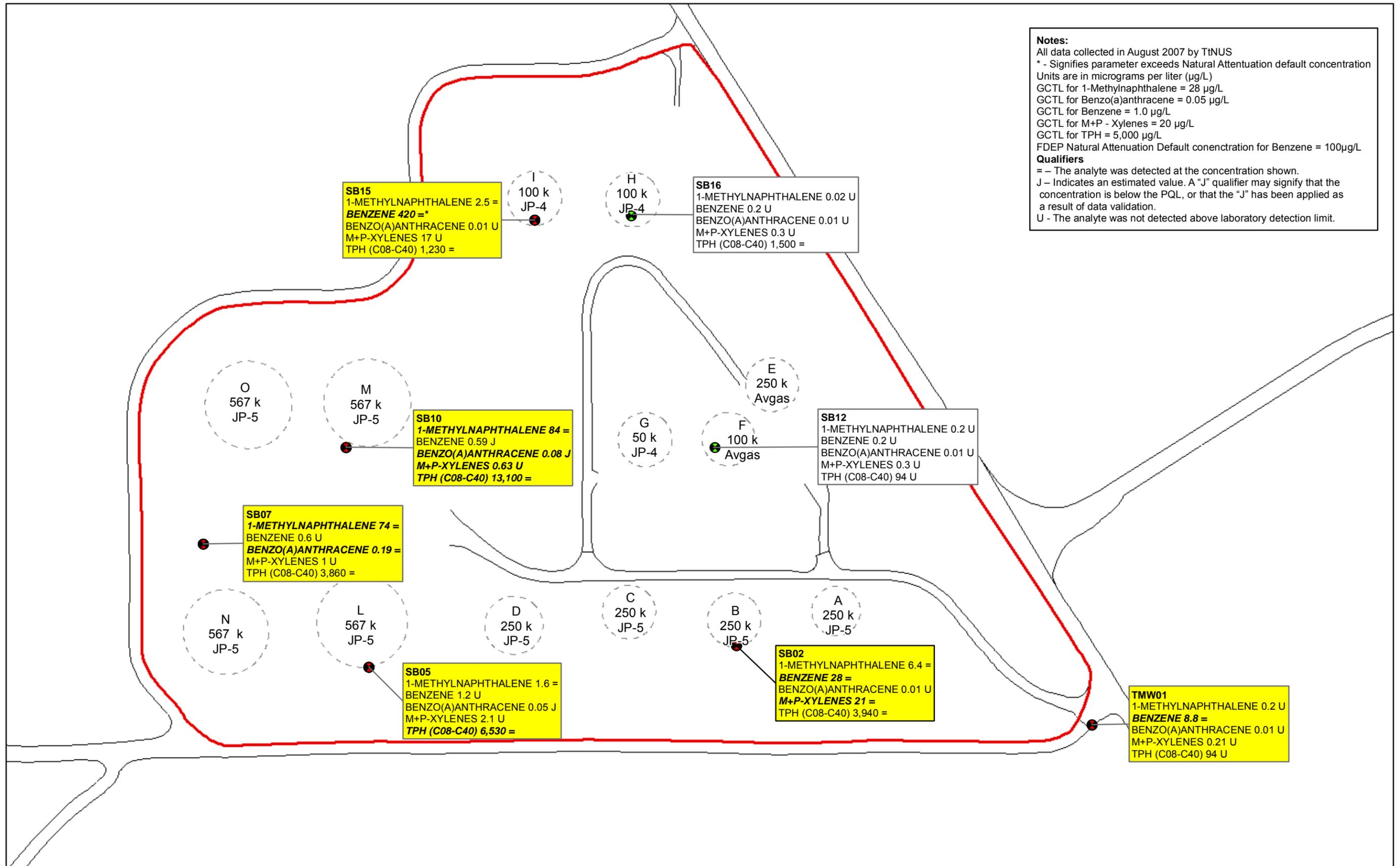
TABLE 1-3
 Groundwater Statistical Data Summary
 Gas Hill Fuel Farm, Naval Air Station Jacksonville
 Jacksonville, Florida

Parameter Name	Number of Samples	Number of Detects	Units	Minimum Concentration	Maximum Concentration	GCTL	Exceed Groundwater GCTL	Natural Attenuation Default Concentration	Exceed Natural Attenuation Default Concentration	Maximum Concentration Location	Minimum Concentration Location
Lead	8	6	µg/L	3.00E+00	8.00E+00	1.50E+01	0	1.50E+02	0	TMW01	SB02, SB05, SB12
1-Methylnaphthalene	8	5	µg/L	1.60E+00	8.40E+01	2.80E+01	2	2.80E+02	0	SB10	SB05
2-Methylnaphthalene	8	6	µg/L	3.00E-02 J	1.70E+01	2.80E+01	0	2.80E+02	0	SB10	SB16
Acenaphthene	8	6	µg/L	4.00E-02 J	9.50E+00	2.00E+01	0	2.00E+02	0	SB07	SB02
Anthracene	8	3	µg/L	1.00E-01	3.00E+00	2.10E+03	0	2.10E+04	0	SB07	SB05
Benzo(a)anthracene	8	3	µg/L	5.00E-02 J	1.90E-01	5.00E-02	2	5.00E+00	0	SB07	SB05
Chrysene	8	1	µg/L	8.00E-02 J	8.00E-02 J	4.80E+00	0	4.80E+02	0	SB07	SB07
Fluoranthene	8	3	µg/L	3.40E-01	6.10E+00	2.80E+02	0	2.80E+03	0	SB07	SB05
Fluorene	8	4	µg/L	5.00E-02 J	5.80E+00	2.80E+02	0	2.80E+03	0	SB07	SB02
Naphthalene	8	7	µg/L	5.00E-02 J	8.80E+00	1.40E+01	0	1.40E+02	0	SB02	SB16, TMW01
Phenanthrene	8	3	µg/L	2.90E-01	1.60E+01	2.10E+02	0	2.10E+03	0	SB07	SB05
Pyrene	8	3	µg/L	3.00E-01	3.70E+00	2.10E+02	0	2.10E+03	0	SB07	SB10
Benzene	8	4	µg/L	5.90E-01 J	4.20E+02	1.00E+00	3	1.00E+02	1	SB15	SB10
Ethylbenzene	8	3	µg/L	3.80E+00	1.30E+01	3.00E+01	0	3.00E+02	0	SB02	SB10
M- and p-Xylenes	8	1	µg/L	2.10E+01	2.10E+01	2.00E+01	1	2.00E+02	0	SB02	SB02
O-Xylene	8	1	µg/L	5.60E+00 J	5.60E+00 J	2.00E+01	0	2.00E+02	0	SB02	SB02
Toluene	8	5	µg/L	9.70E-01 J	2.90E+01	4.00E+01	0	4.00E+02	0	SB15	SB16
TPH (C08-C40)	8	6	µg/L	1.23E+03	1.31E+04	5.00E+03	2	5.00E+04	0	SB10	SB15

µg/L – micrograms per liter
 GCTL – groundwater cleanup target level

Notes:
 All data collected in August 2007 by TtNUS
 * - Signifies parameter exceeds Natural Attenuation default concentration
 Units are in micrograms per liter (µg/L)
 GCTL for 1-Methylnaphthalene = 28 µg/L
 GCTL for Benzo(a)anthracene = 0.05 µg/L
 GCTL for Benzene = 1.0 µg/L
 GCTL for M+P - Xylenes = 20 µg/L
 GCTL for TPH = 5,000 µg/L
 FDEP Natural Attenuation Default concentration for Benzene = 100µg/L

Qualifiers
 = - The analyte was detected at the concentration shown.
 J - Indicates an estimated value. A "J" qualifier may signify that the concentration is below the PQL, or that the "J" has been applied as a result of data validation.
 U - The analyte was not detected above laboratory detection limit.



● Temporary Well Location > GCTL
 ● Temporary Well Location < GCTL
 — Site Boundary
 — Road Curb Line

○ Former Tank Location

Yellow label indicates an exceedance; exceedances are **bolded and italicized**

SB16
 1-METHYLNAPHTHALENE 0.02 U
 BENZENE 0.2 U
 BENZO(A)ANTHRACENE 0.01 U
 M+P-XYLENES 0.3 U
 TPH (C08-C40) 1,500 =

Station Identification
 1-Methylnaphthalene + Concentration + Qualifier
 Benzene + Concentration + Qualifier
 Benzo(a)anthracene + Concentration + Qualifier
 M+P - Xylenes + Concentration + Qualifier
 TPH (C08-C40) + Concentration + Qualifier

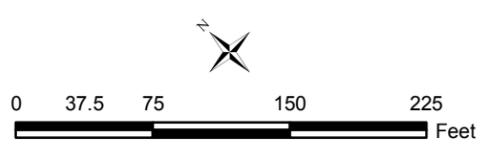


FIGURE 1-4
 1-Methylnaphthalene, Benzo(a)anthracene, Benzene, M+P - Xylenes, TPH (C08-C40) In Temporary Monitoring Wells Gas Hill Fuel Farm NAS, Jacksonville, Florida

2.0 Project Execution Plan

This section of the Site Assessment Work Plan presents the scope of work that will 1) further define the extent of hydrocarbons in soil and groundwater, 2) evaluate whether hot spots exist within the former tank farm that may act as a continuing contaminant source, 3) evaluate whether conditions are favorable for MNA to occur, and 4) prepare both a SAR and RAP.

2.1 Scope of Work

The follow tasks will be performed as part of the additional assessment work:

- Mobilization, site preparation, and completion of an underground utility survey
- Soil boring advancement and collection of soil samples for chemical analysis
- Monitoring well installation and collection of groundwater samples for chemical analysis
- Surveying of newly installed borings, up to 10 previously installed wells, and the topography of Gas Hill Fuel Farm area
- Characterization, containerization, transportation, and disposal (T&D) of contaminated media
- Decontamination and demobilization

The scope for each task is described below.

2.1.1 Mobilization, Site Preparation, and Underground Utility Survey

This task consists of mobilizing personnel and equipment to the project site to perform the work. During this effort, CH2M HILL will establish areas for equipment storage and decontamination, and will locate connection points to potable water and electrical power. Project management tasks will include coordination with Base personnel to obtain the necessary authorization, clearances, training, and badges so both CH2M HILL and its subcontractors can perform work within the former location of the tank farm.

Prior to the commencement of intrusive work, the state of Florida utility protection center (Sunshine State One Call of Florida), the NAS Jacksonville Facilities and Engineering Division, and the NAS Jacksonville Environmental Facilities Department will complete a site utility survey, acquire utility layout plans, and complete the excavation (“dig”) permit. In addition, a private utility locate firm will identify underground utilities in the area of the proposed soil borings and monitoring wells. Utilities in the work area will be marked with paint and stakes, as appropriate. Any damage to underground utilities or subsurface structures will be reported immediately to the NAS Jacksonville Environmental Facilities Department and Sunshine State One Call of Florida.

2.1.2 Soil Investigation

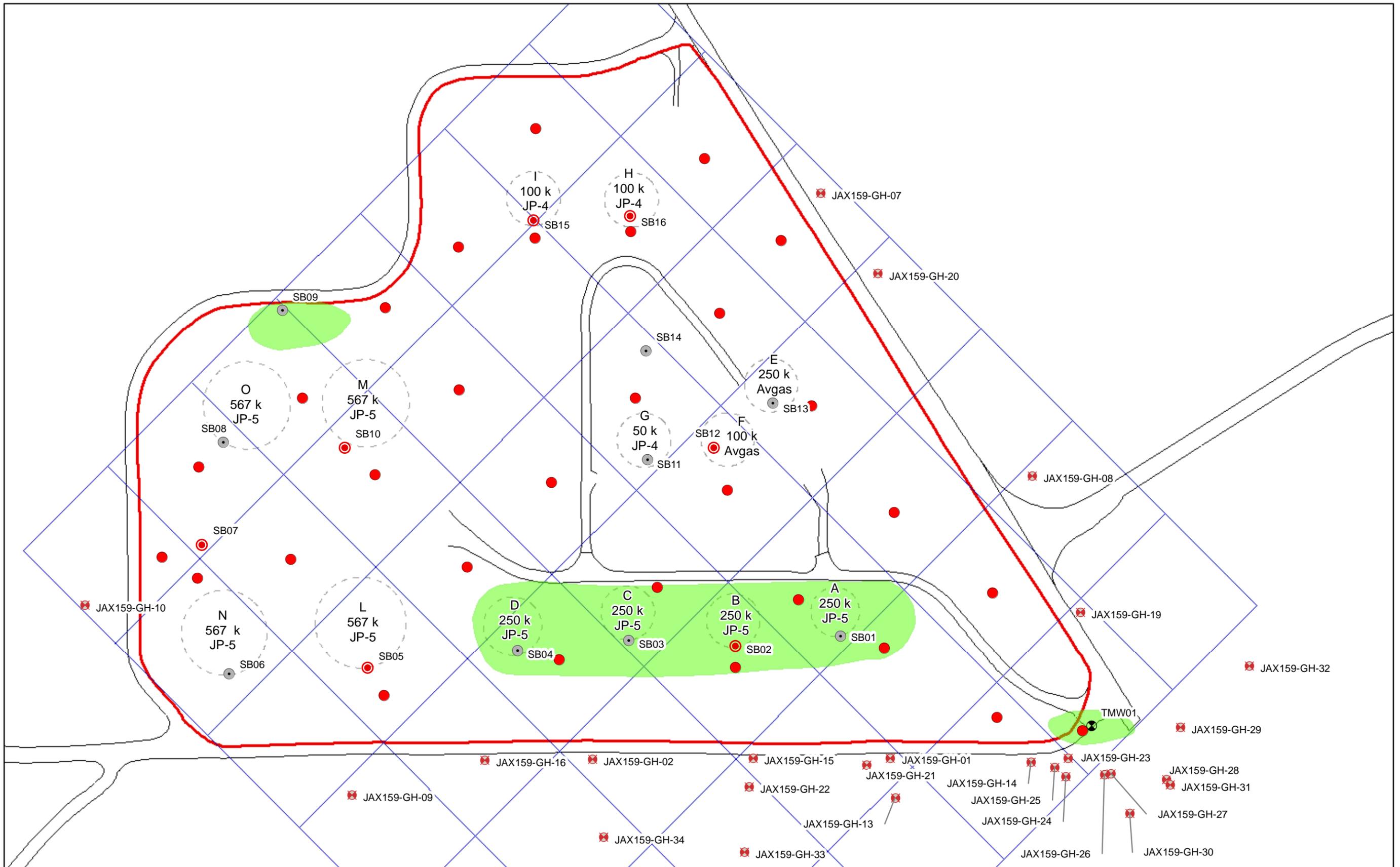
The primary objective of the soil investigation will be to evaluate the nature and extent of residual petroleum hydrocarbon contamination in the soil following the excavation work that was performed in 2006. This data combined with the August 2007 data will be used to determine if additional testing and/or remediation is required to reduce hydrocarbon concentrations in soil to the SCTLs.

Up to 30 soil borings will be advanced in the locations shown on Figure 2-1. Boring locations were selected based on review of historical data (i.e., in areas where contamination was previously detected) and were spaced to provide a representative coverage of the area encompassed by the former tank farm. The following tasks will be performed as part of the soil investigation:

- Up to 30 soil borings will be advanced to the top of the water table using a direct push technology (DPT) drill rig. Soil samples will be collected continuously for lithologic description, headspace screening, and chemical analysis.
- Two soil samples will be collected from each boring for chemical analysis. For purposes of evaluating direct exposure risk to human health, one soil sample will be collected from 0 to 2 feet bgs, and the second sample will be selected based on the results of headspace screening. The soil sample from each boring exhibiting the highest headspace reading in the unsaturated zone below 2 feet bgs will be submitted for chemical analysis. A flame ionization detector (FID) will be used to measure the headspace for volatile organic compounds (VOCs). If headspace readings are non-detect, the soil sample immediately above the water table will be sent to the laboratory for chemical analysis. These samples will be used to evaluate the leaching potential of hydrocarbons to groundwater.
- Soil samples from each boring will be analyzed for BTEX and naphthalene by EPA Method 8260B, PAHs (16 PAH compounds including 1-methylnaphthalene and 2-methylnaphthalene) by EPA Method 8270), and TPH by the FL-PRO Method. A total of 60 soil samples (two from each boring) plus an additional 10 percent QA/QC samples (six QA/QC samples) will be submitted to an FDEP-approved laboratory for chemical analysis.
- Soil borings that are not completed as monitoring wells (see Section 2.1.3) will be grouted using a grout-slurry of bentonite mixed with Portland cement.

2.1.3 Groundwater Investigation

The primary objective of the groundwater investigation will be to install monitoring wells to evaluate groundwater flow direction, test for the presence of LNAPL, and to evaluate the extent of dissolved hydrocarbons. Water quality data collected from the groundwater investigation will be compared to the GCTL and FDEP Natural Attenuation Default Concentration criteria to evaluate if active remedial actions are necessary to reduce hydrocarbons in groundwater. In addition, groundwater samples will also be collected to evaluate whether conditions are favorable for natural attenuation to occur.



- Proposed Soil Sample Location
- Soil Boring Location
- ⊙ Soil Boring/ Temporary Monitoring Well Location
- ⊙ Temporary Monitoring Well Location
- ⊕ Monitoring Well Location
- Grid (129 ft x 140 ft)
- Site Boundary
- Road Curb Line
- Reported Release Area
- Former Tank Location

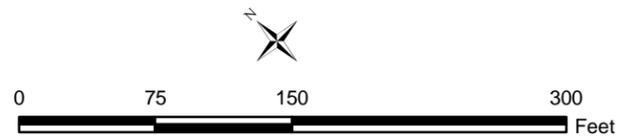


FIGURE 2-1
 Proposed Soil Sample Locations
 Gas Hill Fuel Farm
 NAS, Jacksonville, Florida

Seven of the 30 boreholes will be completed as 2-inch diameter monitoring wells. Well locations will be selected during the field activities based on elevated headspace screening results and observations made during soil investigation, such as soil staining, if present. Spacing will also be considered to provide sufficient coverage over the footprint of the former tank farm. The following tasks will be performed as part of the groundwater investigation:

- Seven DPT borings will be completed as 2-inch diameter monitoring wells. The wells will be installed to 13 feet bgs using a DPT rig that is equipped with a 4.25-inch diameter hollow stem auger (HSA). Each monitoring well will be constructed using 10 feet of 2-inch diameter Schedule 40 polyvinyl chloride (PVC) well screen (slot size of 0.010 inches) and 3 feet of 2-inch diameter Schedule 40 PVC riser. The screens will be positioned to straddle the water table to allow LNAPL, if present, to enter the well. Sand pack will then be placed within the annular space between the borehole and the screen, and will be brought to a height 1 foot above the top of the screen. One foot of bentonite will be placed above the sand pack, followed by grout to ground surface. Each well will be finished as an aboveground completion set in a 2-foot square concrete pad.
- Each well will be developed upon completion using a surge block in conjunction with a pump. Development will continue until the water produced is clear and relatively free of sediment.
- A 48-hour period following well development will be observed prior to gauging and sampling. The newly installed wells and the eight temporary wells installed by TtNUS in August 2007 will be gauged using an oil/water interface probe to determine depth to groundwater and LNAPL, if present.
- Groundwater samples will be collected from the seven newly installed wells and from three previously installed monitoring wells and analyzed for BTEX by EPA Method 8260B, PAHs (including 1-and 2-methylnaphthalene) by EPA Method 8270C, and TPH by the FL-PRO Method. The three existing wells will be selected based on historical groundwater data and the spatial relationship to the seven newly installed wells. Downgradient wells near the Gas Hill Fuel Farm site boundary and wells with detected concentrations of petroleum hydrocarbons are preferred.
- Groundwater samples from 5 of the 10 wells will also be collected and analyzed for the following MNA parameters: sulfate/sulfide, alkalinity, nitrate/nitrite, total organic carbon, and ferrous iron. Data from the five wells will be representative of site geochemistry and will be used to evaluate the aquifer's ability to attenuate the petroleum hydrocarbons. The five wells will be selected based on a spatial relationship to each other. During sampling, field measurements of dissolved oxygen (DO), oxidation-reduction potential (ORP), temperature, pH, and conductivity will also be recorded. The MNA samples will be collected from one well located upgradient of the former tank area, three wells within the plume, and from one well located downgradient on the downgradient edge of the plume.

2.1.4 Site Surveying

Following the initial monitoring event, a Florida-registered professional land surveyor will survey the location of the 30 soil borings, 7 new monitoring wells, and the temporary wells installed by TtNUS during the August 2007 investigation. All survey data will conform to the Tri-Service Spatial Data Standards. Horizontal controls for graphic and non-graphic information are Mercator Projection, GRS 80, State Plan Coordinate System, North American Datum 1983, Lambert Zones 1 through 6 (or appropriate zone for region to be mapped). Vertical controls are mean sea level, North American Vertical Datum, 1988.

2.1.5 Characterization, Containerization, and T&D of Contaminated Media

Disposal characterization sampling and laboratory analyses will be completed to determine the necessary handling and T&D requirements. Soil drill cuttings and water accumulated during well development and purging activities will be containerized in 55-gallon drums. Soil and groundwater will be managed as separate waste streams. One composite sample per 20 drums of each waste stream will be collected in accordance with Section 3.0 Sampling and Analysis Plan. The soil will be transported to a facility permitted to accept the petroleum-impacted material.

2.1.6 Demobilization and Decontamination

CH2M HILL and its subcontractor personnel, equipment, and unused materials will be demobilized from the site at the completion of the soil and groundwater investigation.

Personnel and equipment will be cleaned to remove residual contamination. Waste fluids accumulated during cleaning will be containerized in 55-gallon drums, and will be sampled in accordance with Section 3.0 Sampling and Analysis Plan. Solid and liquid waste will be managed, transported, and disposed in accordance with Section 4.0 Waste Management Plan. Decontamination of personnel and equipment will be performed in accordance with the site-specific HSP provided in Appendix A and the applicable provisions of 29 Code of Federal Regulations (CFR) 1910.120.

2.2 SAR and RAP

This task includes the preparation and submittal of "Draft" and "Final" versions of a SAR and RAP in accordance with the FDEP Petroleum Site Cleanup Criteria, Chapter 62-770, Florida Administrative Code (FAC).

The SAR will summarize the results of the proposed site assessment. The RAP will describe the preferred remedial alternative to address petroleum contaminated soil and groundwater at the site.

2.3 Project Schedule

The primary project activities and estimated duration for each are outlined below. Field work will begin following approval of this Site Assessment Work Plan.

- Pre-construction meeting/submittal preparation/reviews 1 week
- Mobilization and site preparation 2 days

- Underground utility location survey 2 days
- Soil sampling activities 2 weeks
- Monitoring well installation 1 week
- Groundwater sampling 1 week
- Site surveying 3 days
- Site restoration 2 days
- Preparation of SAR and RAP Reports 10 weeks

This proposed schedule may vary depending on the actual conditions encountered. The project schedule is presented in Appendix B.

2.4 Communications Plan

A communication matrix outlining lines of communication for NAVFAC SE and CH2M HILL is presented in Table 2-1. Table 2-2 provides a project personnel directory.

TABLE 2-1
 Communications Matrix
Gas Hill Fuel Farm, Naval Air Station Jacksonville
Jacksonville, Florida

CH2M HILL Position	Navy Direct Report
Phil Smith, Executive Sponsor	Richard Stanley, CO
Sidney Allison, Program Manager	Dorothy Okamoto, COTR Richard Stanley, ACO
Casey Hudson, CTO Project Manager	Dorothy Okamoto, COTR Richard Stanley, ACO Anthony Robinson, RPM Art Mosley, NTR/ROICC Tim Curtin, NAS Jacksonville

CO – Contracting Officer
 ACO – Administrative Contracting Officer
 NTR – Navy Technical Representative
 RPM – Remedial Project Manager
 COTR – Contracting Officer’s Technical Representative

TABLE 2-2
 Project Personnel Directory
Gas Hill Fuel Farm, Naval Air Station Jacksonville
Jacksonville, Florida

Contact	Company
Sidney Allison, Program Manager Casey Hudson, CTO Project Manager Robert Hess, Contracts Administration Manager Theresa Rojas, QA/QC Manager	CH2M HILL Constructors, Inc. 400 Northpark 1000 Abernathy Road, Suite 1600 Atlanta, GA 30328 770/604-9095
Richard Rathnow, Health and Safety Manager	2035 Lakeside Centre Way Suite 200 Knoxville, TN 37922 865/560-2908

TABLE 2-2
 Project Personnel Directory
Gas Hill Fuel Farm, Naval Air Station Jacksonville
Jacksonville, Florida

Contact	Company
Richard Stanley, CO	NAVFAC SE P.O. Box 190010 North Charleston, SC 29419-9010 843/820-5939
Dorothy Okamoto, COTR	As above 843/820-5940
Anthony Robinson, RPM	As above 843/820-7339
Art Mosley, NTR/ROICC	Engineering Field Activity Southeast Environmental Programs Coordinator/Resident Officer in Charge of Construction P. O. Box 5 NAS Jacksonville, FL 32212 904/542-5571, ext. 234
Tim Curtin, NAS Jacksonville Installation Restoration Manager	Facilities Engineering Command Building 27 NAS Jacksonville, FL 32212 904/542-4228

2.5 Traffic Control Plan

Traffic control will be the responsibility of the CH2M HILL Project Superintendent. CH2M HILL will minimize disturbance to NAS Jacksonville traffic patterns during project activities. CH2M HILL will consult with onsite personnel to evaluate site access, placement of equipment, and traffic flow to minimize the impact of this work to site operations.

3.0 Sampling and Analysis Plan

This section describes the sampling procedures that will be followed during execution of the work scope described in Section 2.0 Project Execution Plan. Analytical methods, data quality objectives, protocol for equipment decontamination, and procedures used for the collection of samples for waste characterization are discussed in this section. Any changes to the activities described in this SAP must be documented as an addendum and must be approved by the Project Manager and Project Chemist.

3.1 Data Quality Levels for Measurement Data

The data quality levels for each sampling task are listed in Table 3-1. The sampling events, sampling and analytical requirements, and the required level of QC and data packages are listed in Table 3-2. The quantity, project action, accuracy, precision, and completeness limits by which the data will be evaluated will be provided by the selected laboratory, and will be approved by CH2M HILL's Project Chemist. All analytical data will be submitted by both hard copy and electronic files.

Samples will be collected in accordance with the EPA Region IV Environmental Investigative Standard Operating Procedures and Quality Assurance Manual (EISOPQAM), (EPA, 2001) and FDEP Standard Operating Procedures (SOPs) for Field Activities, DEP-SOP-001/01, February 1, 2004. Where two documents conflict, the more stringent will apply.

The sampling team will be qualified under the Navy Installation Restoration Chemical Data Quality Manual (IRCDQM), 1999 sampling requirements. A Navy-, USACE-, or Air Force Center for Engineering and the Environment (AFCEE)- and FDEP-approved laboratory will be used for all sample analyses.

TABLE 3-1
Data Quality Levels
*Gas Hill Fuel Farm, Naval Air Station Jacksonville
Jacksonville, Florida*

Sampling Activity	Data Quality Level Category
Soil Sampling (offsite laboratory analyses)	Definitive
Headspace Screening (using FID)	Screening
Groundwater Sampling (offsite laboratory analyses)	Definitive
Waste Characterization of Soils and Liquid Waste (offsite laboratory analyses)	Definitive

TABLE 3-2
 Sampling and Analysis Summary Table
 Gas Hill Fuel Farm, Naval Air Station Jacksonville
 Jacksonville, Florida

Sample Task	Sample Point	Matrix	Sampling Frequency	Approx Sample No	Sampling Method (Note 1)	Sampling Equipment (Note 1)	TAT (Note 2)	Data Package Reqmnt	Required Analysis	Analytical Method	Holding Time	Sample Preservation	Containers
DPT Soil Sampling													
DPT Soil Sampling	Locations based on previous releases and tanks (Figure 2-1)	Soil	Once	60 + 6 DUPs + 3 MS/MSD = 72	Composite 5 random grabs into 1 sample (1 grab for volatiles)	DPT rig	14 days	CH2M HILL Level C	BTEX and naphthalene	8260B	14 day	Cool to 4°C; Two vials contain sodium bisulfate or DI water & one contains methanol	(3) 40 mL vials; plus 2-oz jar
									PAH including 1- & 2-methylnaphthalene	8270SIM	14 days ext; 40-days analysis	Cool to 4°C	(1) 4 oz glass
									TPH	FL-PRO	14 days ext; 40-days analysis	Cool to 4°C	(1) 4 oz glass
	Equipment Rinsate Blank	Water	1 per 10% of sampling	6	Prepared in Field	Analyte-free water, SS funnel	14 days	CH2M HILL Level C	BTEX and naphthalene	8260B	14 day	HCl pH< 2; Cool to 4°C	(2) 40 mL vials
									PAH including 1- & 2-methylnaphthalene	8270SIM	7 days ext; 40-days analysis	Cool to 4°C	(2) 1-L amber glass
									TPH	FL-PRO	7 days ext; 40-days analysis	HCl pH< 2; Cool to 4°C	(2) 1-L amber glass
	Trip Blank	Water	1 Per cooler containing volatile samples	5	Prepared by Lab	(2) 40 mL vials	14 days	CH2M HILL Level C	BTEX and naphthalene	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40 mL vials
Groundwater Sampling													
Groundwater Sampling	Monitoring Wells (7 New and 3 Existing Wells)	Water	quarterly	10 + 1 DUP + 1 MS/MSD = 13 (per quarter)	Grab	Hand Bailer	14 days	CH2M HILL Level C	BTEX and naphthalene	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40 mL vials
									PAH including 1- & 2-methylnaphthalene	8270SIM	7 days ext; 40-days analysis	Cool to 4°C	(2) 1-L amber glass
									TPH	FL-PRO	7 days ext; 40-days analysis	HCl pH< 2; Cool to 4°C	(2) 1-L amber glass
	Monitoring Wells (7 New and 3 Existing Wells)	Water	quarterly	5 + 1 DUP + 1 MS/MSD = 8 (per quarter)	Grab	Hand Bailer	14 days	CH2M HILL Level C	Sulfate	300.0 / 300.1	28 days	Cool to 4°C	(1) 500-mL plastic
									Sulfide	SM 4500-S2-F	7 days	Cool to 4°C, pH>9 w/H2SO4	(1) 500-mL plastic
									Nitrate	300.0 / 300.1	48 hours	Cool to 4°C	(1) 500-mL plastic

TABLE 3-2
 Sampling and Analysis Summary Table
 Gas Hill Fuel Farm, Naval Air Station Jacksonville
 Jacksonville, Florida

Sample Task	Sample Point	Matrix	Sampling Frequency	Approx Sample No	Sampling Method (Note 1)	Sampling Equipment (Note 1)	TAT (Note 2)	Data Package Reqmnt	Required Analysis	Analytical Method	Holding Time	Sample Preservation	Containers
									Nitrite	300.0 / 300.1	48 hours	Cool to 4°C	(1) 500-mL plastic
									Alkalinity	SM 2320-B	14 days	Cool to 4°C	(1) 500-mL plastic
									TOC	SM 5310B	28 days	Cool to 4°C, pH<2 w/HCl or H2SO4	(2) 40 mL vials
									Ferrous Iron	SM 3500-Fe-D	Immediate	Cool to 4°C	(2) 40 mL vials
	Equipment Rinsate Blank	Water	1 per 10% of sampling	1	Prepared in Field	Analyte-free water, SS funnel	14 days	CH2M HILL Level C	BTEX and naphthalene	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40 mL vials
									PAH including 1- & 2-methylnaphthalene	8270SIM	7 days ext; 40-days analysis	Cool to 4°C	(2) 1-L amber glass
									TPH	FL-PRO	7 days ext; 40-days analysis	HCl pH< 2; Cool to 4°C	(2) 1-L amber glass
									Sulfate	300.0 / 300.1	28 days	Cool to 4°C	(1) 500-mL plastic
									Sulfide	SM 4500-S2-F	7 days	Cool to 4°C, pH>9 w/H2SO4	(1) 500-mL plastic
									Nitrate	300.0 / 300.1	48 hours	Cool to 4°C	(1) 500-mL plastic
									Nitrite	300.0 / 300.1	48 hours	Cool to 4°C	(1) 500-mL plastic
									Alkalinity	SM 2320-B	14 days	Cool to 4°C	(1) 500-mL plastic
									TOC	SM 5310B	28 days	Cool to 4°C, pH<2 w/HCl or H2SO4	(2) 40 mL vials
									Ferrous Iron	SM 3500-Fe-D	Immediate	Cool to 4°C	(2) 40 mL vials
	Trip Blank	Water	1 per cooler containing volatile samples	1	Prepared by Lab	N/A	14 days	CH2M HILL Level C	BTEX and naphthalene	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40 mL vials
Waste Characterization Sampling													
Disposal of Solid Wastes	55-gallon drums containing soil cuttings	Solids/ Soil	One per 20 drums or one per container or as required by disposal facility	1	Composite 5 random grabs into 1 sample (do not composite BTEX)	SS Auger, SS Spoons, SS Bowl	7 days	CH2M HILL Level B	TCLP Volatiles	1311/8260B	14 day TCLP extraction; 14 day analysis	Cool to 4°C	(1) 4 oz glass
									TCLP Semi-Volatiles	1311/8270 C	14 day TCLP extr; 7 day extr; 40 day analysis	Cool to 4°C	(1) 16 oz glass

TABLE 3-2
 Sampling and Analysis Summary Table
 Gas Hill Fuel Farm, Naval Air Station Jacksonville
 Jacksonville, Florida

Sample Task	Sample Point	Matrix	Sampling Frequency	Approx Sample No	Sampling Method (Note 1)	Sampling Equipment (Note 1)	TAT (Note 2)	Data Package Reqmnt	Required Analysis	Analytical Method	Holding Time	Sample Preservation	Containers
									TCLP Pesticides	1311/8081A	14 day TCLP extr; 7 day extr; 40 day analysis		
									TCLP Herbicides	1311/8151A	14 day TCLP extr; 7 day extr; 40 day analysis		
									TCLP Metals	1311/6010B , 7470A	6 month TCLP extr; 6 month analysis Hg: 28 day TCLP extr; 28 day analysis	Cool to 4°C	(1) 8 oz glass
									PCBs	8082	14 days ext; 40-days analysis	Cool to 4°C	(1) 4 oz glass
									Ignitability	1030	ASAP	Cool to 4°C	(1) 4 oz glass
									Corrosivity	9045A	ASAP		
									Disposal of Liquid Waste from well development, purge water, etc.	55-gallon drums containing liquid waste	Water	One per 20 drums or one per container or as required by disposal facility	1
									TCL Semi-volatiles	8270C	7 days ext; 40-days analysis	Cool to 4°C	(2) 1-L amber glass
									TCL Pesticides	8081A	7 days ext; 40-days analysis		(2) 1-L amber glass
									Herbicides	8151A	7 days ext; 40-days analysis		(2) 1-L amber glass
									PCBs	8082	7 days ext; 40-days analysis		(2) 1-L amber glass
									TAL Metals	6010B/7470 A	180 days; Hg = 28 days	HNO ₃ pH< 2; Cool to 4°C	(1) 500ml HDPE
									Ignitability	1010/1020A	ASAP	Cool to 4°C	(1) 500ml HDPE
									Corrosivity	9040B	ASAP		

TAL – Target Analyte List
 TCL – Target Compound List
 TCLP – Toxicity Compound Leaching Procedure
 PCBs – polychlorinated biphenyls
 BTEX – benzene, toluene, ethylbenzene, and xylenes

3.2 Sampling Objectives

The sampling objectives for this project will be as follows:

- Collect 60 soil samples using a DPT rig to further characterize the extent hydrocarbons in soil. Soil samples will be analyzed for BTEX and naphthalene by EPA Method 8260B), PAH (18 PAHs including both 1-methylnaphthalene and 2-methylnaphthalene) by EPA Method 8270C, and TPH by the FL-PRO Method.
- Collect 10 groundwater samples for the analysis of BTEX and naphthalene by EPA Method 8260B, PAHs (16 PAH including both 1-methylnaphthalene and 2-methylnaphthalene) by EPA Method 8270C, and TPH by the FL-PRO Method.
- Collect groundwater samples from five of the 10 wells for the following MNA parameters: sulfate/sulfide, alkalinity, nitrate/nitrite, total organic carbon, and ferrous iron.
- Collect soil/water samples for waste characterization of soil cuttings from well installation and decontamination water, purge water, or other waste accumulated by sampling activities, as necessary.

3.3 Soil Sampling

As described in Section 2.0 Project Execution Plan, two soil samples will be collected from each borehole and analyzed for BTEX and naphthalene, PAHs, and TPH. Procedures used during soil sampling are described below.

Procedures for soil samples to be analyzed for BTEX and naphthalene by EPA Method 8260B

1. Using a TerraCore® sampler, collect an approximate 5-gram sample from the soil within the DPT core.
2. Place the 5-gram sample into a pre-preserved volatile organic analysis (VOA) vial and seal the cap tightly. Do this for all three vials provided by the laboratory. Two vials contain sodium bisulfate and the one contains methylene chloride (Note: the entire operation of filling the TerraCore® sampler, pushing it into the vial, and capping the vial; should not take more than 1 minute to fill all three vials).
3. After filling the VOA vials, fill a 4-ounce jar completely full with the remaining core sample. This will be used by the laboratory to determine percent moisture.
4. Label the vials.
5. Place in cooler for shipment to the laboratory for chemical analysis

Procedures for soil samples to be analyzed for PAH by EPA Method 8270C) and TPH by FL-PRO

1. Remove the remaining soil from the DPT core at the desired sample interval.
1. Place the soil into a stainless steel bowl and homogenize by the quartering techniques using the stainless steel spoon.
2. Fill two 8-ounce glass jars with soil, close the jar, label, and package the sample and place in a cooler on ice for shipment to the laboratory.

All samples will be packed on ice and delivered to the FDEP-approved laboratory under standard chain-of-custody (COC) procedures for chemical analysis. Level C data package will be required along with appropriate QC samples for required analyses. All analytical data will be submitted by both hard copy and electronic files.

Excess soil will be emptied from the DPT cores into a 55-gallon drum, and will be characterized in accordance with the procedures described in Section 4.0 Waste Management Plan.

3.4 Groundwater Sampling and Analyses

As described in Section 2.0 Project Execution Plan, samples will be collected from the seven newly installed and three existing wells and analyzed for BTEX and naphthalene, PAHs, and TPH. In addition, samples will be collected from 5 of the 10 wells for MNA analyses. Groundwater samples will be collected following the EPA's procedures for low-flow groundwater sampling. The procedure outlined below is based on the EPA's paper entitled "Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures" (EPA, 1996), and are as follows:

1. Slowly lower the decontaminated pump or pump intake to the middle of the screened interval to minimize excessive mixing of the stagnant water in the casing above the screen with water within screened zone, and to minimize re-suspension of solids that may have accumulated at the bottom of the well.
2. Once the pump is positioned in the well, an airtight flow-through cell (equipped with a YSI-type water quality meter) will be connected to the water discharge line.
3. A water level meter will then be lowered in to the well to monitor changes in water level during pumping. Once purging begins, water level measurements will be monitored, and pumping rates will be adjusted so the rate is between 0.1 to 0.3 liter per minute (L/min) to maintain minimal drawdown.
4. While purging, field parameters (DO, pH, temperature, conductivity, salinity, turbidity, and ORP) will be measured every 3 to 5 minutes using a YSI-type meter, and will be recorded until all parameters have stabilized for 3 consecutive readings. Once field parameter stabilization is achieved, the sample bottles will be filled.
5. Water samples will be collected by directing the groundwater discharge stream from the pump so that it runs down the inside of the sample bottle with a minimum amount of splashing. To minimize VOC loss, samples to be analyzed for BTEX and naphthalene will be collected first followed by the analyses for PAHs, TPH, sulfate/sulfide,

alkalinity, nitrate/nitrite, total organic carbon, and ferrous iron. The sample bottles for each analysis are as follows:

- BTEX and naphthalene by EPA Method 8260B: Three 40-mL VOA vials containing a hydrochloric acid (HCl) preservative. Fill bottles so there is no headspace within the bottles.
 - PAHs by EPA Method 8270: Two 1-liter amber jars. Fill to the top of the jar.
 - TPH by the FL-PRO Method: Two 1-liter amber jars. Fill to the top of the jar.
 - Sulfate/sulfide by EPA Method 375.4 and EPA Method 376.1, respectively: One 125-mL bottle jar for sulfate, and one 500-mL bottle jar containing sodium hydroxide (NaOH) preservative for sulfide. Fill to the top of each bottle.
 - Alkalinity by EPA Method 310.1: One 500-mL plastic bottle containing no preservative. Fill to the top of the bottle.
 - Nitrate/nitrite by EPA Method 353.2: One 125-mL plastic bottle containing sulfuric acid (H₂SO₄) preservative. Fill to the top of the bottle.
 - Total organic carbon by EPA Method 415.1: Two 40-mL VOA vials or amber glass bottle containing either HCl or H₂SO₄ preservative. Fill to the top of the bottle.
 - Ferrous iron by EPA Method SM 3500-Fe-D: Two 40-mL VOA vials containing no preservative. Fill to the top of the bottle.
6. Cap each bottle and affix label to the bottle. Label information will include laboratory, project name and number, sample identification, station identification, preservative, analysis, sampler's initials, sample date, and time. Place samples in appropriate containers and pack with ice in coolers.

Requirements for sample collection, preservation, and analysis are listed in Table 3-2. Samples will be delivered to the laboratory as soon as possible to allow the samples to be analyzed within the specified holding times. Requirements for QA/QC samples are listed in Table 3-2. A CH2M HILL Level C data package will be required with appropriate QC samples from the offsite laboratory. All analytical data will be submitted by both hard copy and electronic files.

Waste characterization results will be reviewed and validated by both CH2M HILL chemists and a third party contracted by CH2M HILL. All other data will be reviewed and validated by CH2M HILL.

Residual purge water collected during sampling will be transferred to a 55-gallon drum and will be characterized in accordance with this SAP and disposed of in accordance with procedures outlined in Section 4.0 Waste Management Plan.

3.5 Waste Characterization and Incidental Waste Stream Sampling and Analyses

3.5.1 Soil/Solids Characterization

Waste characterization samples will be collected to evaluate the T&D requirements of any contaminated soil accumulated during the sampling and drilling activities. Soil/solids characterization samples will be collected from the drums prior to disposal. One composite sample (and one grab for VOC analysis) will be collected from 5 grab representative samples per 20 drums. Soil samples will be collected as follows and analyzed for the parameters listed in Table 3-2. The waste characterization sample will be obtained from the drum as follows:

Procedure for Collecting Volatile Fractions

1. At the selected sample location, using an auger, split spoon, or other similar device retrieve a core.
2. Fill the appropriate sample jars completely full with the sample from the core.
3. Close the jar, label, and package the sample for shipment to the laboratory.

Procedure for Collecting Non-Volatile Samples

1. From five randomly selected sample locations, collect several spoonfuls of the soil into a stainless steel bowl.
2. Homogenize the five samples by the quartering techniques using the stainless steel spoon.
3. Fill the appropriate sample jars completely full with the homogenized sample.
4. Close the jar, label, and package the sample for shipment to the laboratory.

A CH2M HILL Level B package will be required along with appropriate QC samples for the required waste characterization and incidental wastestream samples. All analytical data will be submitted by both hard copy and electronic files.

3.5.2 Water Characterization

Waste characterization samples will be collected to evaluate the handling and T&D requirements of accumulated development water, decontamination water, purge water, and any other miscellaneous collected water. Water characterization samples will be collected from the drums prior to disposal. One composite sample (and one grab for VOC analysis) will be collected from 5 representative grab samples per 20 drums. Water samples will be collected as follows and analyzed for the parameters listed in Table 3-2:

1. Using a bailer or dip jar, collect a water sample from its containment.
2. Fill the sample containers for volatile analyses first (grab sample). The 40-mL vials will be filled so that there is no headspace in each vial.
3. Then fill the sample containers for the remaining analyses.

4. Label and package the samples for shipment to the laboratory.

A CH2M HILL Level B package will be required along with appropriate QC samples for the required waste characterization and incidental waste stream samples. All analytical data will be submitted by both hard copy and electronic files.

3.6 Equipment Decontamination

Sampling methods and equipment have been selected to minimize decontamination requirements and 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 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 water.
4. Rinse thoroughly with isopropanol (pesticide-grade). Do not rinse PVC or plastic items with isopropanol.
5. Rinse thoroughly with organic/analyte-free water.
6. Allow equipment to air dry completely.

3.7 Sample Documentation

Sampling documentation will include the following:

- Numbered COC Forms
- Sample log book, which includes the following information:
 - 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 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.
Details of QC samples obtained
 - 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)

3.8 Field Quality Control

Field duplicate samples, equipment blanks, trip blanks, and matrix spike/matrix spike duplicates (MS/MSD) will be collected at the frequency specified in Table 3-2. Field QC samples are not required for disposal sampling.

3.9 Analytical Methods

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

Preliminary and final analytical results will be faxed to Bethany Garvey in accordance with the TATs listed in Table 3-2. Final hardcopy data and electronic file will be delivered to Kama White within 14 days of sample receipt. Contact information for Bethany Garvey and Kama White is provided as follows:

Bethany Garvey

Laboratory Coordinator
CH2M HILL
Northpark 400
1000 Abernathy Road, Suite 1600
Atlanta, GA 30328
(770) 604.9182 ext 54124
(678) 579.8176 (fax)
bethany.garvey@ch2m.com

Kama White

Database Coordinator
CH2M HILL
Northpark 400
1000 Abernathy Road, Suite 1600
Atlanta, GA 30328
(770) 604.9182 ext 54385
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4.0 Waste Management Plan

The Waste Management Plan describes the waste management requirements and procedures for investigation activities at the Gas Hill Fuel Farm. The work to be performed at the site consists of soil and groundwater sampling that includes use of an offsite fixed base laboratory for data analysis. Waste accumulated during the work will include soil removed during soil sampling and well drilling, groundwater accumulated during well development, purge water accumulated during groundwater sampling, and decontamination fluids accumulated from equipment cleaning. The following additional waste items will also be generated:

- Personal protective equipment (PPE)
- Uncontaminated general construction debris (such as caution tape, pin flags, sections of PVC well casing, and packing materials).

4.1 Waste Characterization and Profile

Waste characterization information typically will be included on a waste profile form provided by the offsite facility. It is assumed that wastes from this activity will be non-hazardous. CH2M HILL will provide analytical data from characterization sampling and analysis. However, in some cases, facilities that are permitted to accept a specific waste material may require specific or additional analyses to evaluate the waste stream before acceptance. Waste characterization sampling will be completed in accordance with the SAP provided in Section 3.0 of this Site Assessment Work Plan.

Waste characterization information for wastes will be documented on a waste profile form provided by the offsite treatment or disposal facility as part of the waste acceptance process. The profile will be reviewed and approved by the CH2M HILL Waste Coordinator prior to submission to the Navy for generator signature. Navy personnel will provide any required generator certification and/or signature. Signed profile will then be submitted to the disposal facility for acceptance approval.

The profile typically requires the following information including but not limited to:

- Generator (Navy) information including name, address, contact, and phone number
- Site name including street/ mailing address
- Process generating waste
- Source of contamination
- Historical use for area
- Waste composition (e.g., 95 percent soil, 5 percent debris)
- Physical state of waste (e.g., solid, liquid, etc.)
- Hazardous waste codes, if applicable

A facility approved copy of the waste profile will be received prior to scheduling of offsite transportation of the waste.

Typically, uncontaminated wastes such as general construction debris will be characterized using process knowledge and generally will be classified as municipal solid waste.

4.2 Waste Management

4.2.1 Waste Storage Time Limit

Hazardous wastes, if generated, will be removed from the site within 90 days from generation. Additionally, as required under Chapter 62-770 FAC, petroleum-contaminated soil (including excessively contaminated soil) will not be stored or stockpiled onsite for more than 60 days. However, petroleum-contaminated soil (including excessively contaminated soil) may be containerized in watertight drums and stored onsite for 90 days, after which time proper treatment or proper disposal of the contaminated soil will occur. Other wastes will be removed from the site as soon as possible.

Debris (concrete), if encountered, will be cleared of all soil and considered non-hazardous construction debris and removed from the site as soon as possible but before 90 days has expired.

Liquids from groundwater well development/purging and decontamination activities will be contained in 55-gallon drums provided by the NAS Jacksonville Public Works Department. The water is expected to be non-hazardous petroleum contaminated water and will be removed from the site as soon as possible. Public Works Department personnel will coordinate transportation, and disposal of the liquid waste contained in the 55-gallon drums. CH2M HILL will be responsible for contacting the Public Works Department at the completion of the project and to provide the waste characterization results to the Navy.

4.2.2 Labels

The labeling of waste containers will be in accordance with 49 CFR 172, 173 and 178. Labels will include the type of waste, location from which the waste was generated, and accumulation start date. Containers, and tanks used to store/accumulate waste (including soil and groundwater) will include one of the following labels:

- “Analysis Pending” or “Waste Material” - Temporary or handwritten label until analytical results are received and reviewed. This label will include the accumulation start date.
- “Hazardous Waste” - Pre-printed hazardous waste labels with the following information:
 - Accumulation start date
 - Generator Name
 - EPA identification number
 - Waste codes
 - Prior to transport the Manifest number must be added (for containers of less than 110-gallon capacity)
- “Non-Hazardous Waste” - Preprinted labels with the following information:

- Accumulation start date
- Generator name
- EPA identification number
- Waste-specific information (e.g., contaminated soil)

Where applicable, the major hazards (e.g., flammable, oxidizer, and carcinogen) will be included on the label.

4.2.3 General Waste Management Requirements

Hazardous wastes will be segregated from non-hazardous wastes. Additionally, incompatible wastes (e.g., flammable and corrosive wastes) will be segregated. Wastes of the same matrix, contamination, and the same source may be aggregated to facilitate storage and disposal.

Wastes will be accumulated in an area identified or approved by the Navy. If an area is not designated, wastes will be accumulated in an area that is not accessible to the general public, and that can be secured.

Temporary waste accumulation areas will contain appropriate emergency response equipment. The HSP (Appendix A) identifies the specific emergency response procedures and equipment. Hazardous waste accumulation areas will include fire extinguishers (in areas where wastes are known or suspected to be flammable or ignitable), decontamination equipment, and an alarm system (if radio equipment is not available to all staff working in accumulation area). Spill control equipment (e.g., sorbent pads) will be available in the waste accumulation areas, and where liquids are transferred from one vessel to another.

All containers, drums, and tanks will be inspected upon arrival at the site for equipment in disrepair and any contamination or contents. If container contains waste upon arrival or is in disrepair, it will be immediately rejected and documented.

Drums/Small Containers

The following guidelines relate to drums and small containers:

- Drums and small containers will be transported to the temporary accumulation areas on wood pallets and will be secured together with non-metallic banding.
- 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 labels will be visible.
- Drums will remain covered except when removing or adding waste 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.
- Drums containing liquids or hazardous waste will be provided with secondary containment.

Tanks

The following guidelines relate to tanks:

- Tanks will be inspected upon arrival onsite for signs of deterioration and contamination. Any tank arriving onsite with contents or in poor condition will be rejected.
- Tanks will be provided with covers and secondary containment.
- Only non-stationary tanks (such as a cargo tank or other wheeled tank) will be used to accumulate hazardous waste.
- Each tank will be labeled as discussed above.

Soil Stockpiles

The following guidelines relate to soil stockpiles:

- Stockpiles of contaminated soil will be located near the excavation areas and within an area of existing contamination.
- Stockpiles will be provided with liner, cover, and perimeter berm to prevent release or infiltration of liquids.
 - Minimum 20-mil polyethylene sheeting will be used for liners and 10- and 6-mil polyethylene sheeting will be used for covers.
 - The perimeter berm will be constructed of clean materials (e.g., hay bales under the liner) and allow for collection of any free liquids draining from the stockpile.
 - Accumulated free liquids will be pumped-out to a container or tank.
- Covers and perimeter berms will be secured in-place when not in use and at the end of each workday, or as necessary to prevent wind dispersion or run-off from major precipitation events.
- Construction materials for the stockpiles that contact contaminated soil will be disposed of as contaminated debris.
- Accumulation start dates will be recorded on a log or a sign located at the stockpile.

Waste/Debris Stockpiles

Where appropriate, debris and waste, or scrap equipment may be accumulated in stockpiles. These stockpiles will be managed in such a manner as to maintain good housekeeping, and to prevent the spread of contamination.

Contaminated debris stockpiles will be provided with containment as indicated for soil stockpiles. Damaged or leaking equipment shall be placed in containers, and may not be stored in storage piles.

Uncontaminated or decontaminated debris stockpiles, or intact equipment should be placed on a liner. These piles shall be covered as necessary to prevent storm water run-on and run-off.

Inspection of Waste Storage Areas

Waste accumulation areas will be inspected for malfunctions, deterioration, discharges, and leaks that could result in a release. The following inspection schedule will be followed:

- At a minimum, weekly inspection of containers, tanks and roll-off containers (for leaks, signs of corrosion, or signs of general deterioration).
- At a minimum, weekly inspection of stockpiles (for liner and berm integrity).

Any deficiencies observed or noted during inspection will be rectified immediately. Appropriate measures may include transfer of waste from leaking container to new container, replacement of liner or cover, or repair of containment berm.

Inspections will be recorded in the daily Quality Control Report and include any deficiencies and how issue was rectified. Copies of the report will be maintained onsite, and available for review.

If operations will suspended for more than 7 days, the regulatory compliance manager and alternate inspection will be contacted and arrangements will be made. Prior to demobilization, all hazardous wastes will be removed from the site.

4.3 Shipping Documentation

Prior to offsite disposal of any waste, a waste approval package will be provided to the Navy for each waste stream. This package shall include a waste profile naming the U.S. Navy as the generator of the waste, analytical summary table(s) applicable to the waste, land disposal restriction (LDR) notification for any hazardous wastes, a completed waste manifest, and any other applicable information necessary for the Navy to complete its review of the disposal package and signature as the generator.

The signed profile will then be submitted to the disposal facility for acceptance approval. Once the approval letter is received from the disposal facility, transportation can be scheduled.

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

- Generator information including name, address, contact, and phone number, EPA identification number
- Transporter information including name, address, contact and phone number, USEPA identification number

- Facility information including name, address, phone number, USEPA identification number
- Site name including street/ mailing address
- U.S. Department of Transportation (DOT) Proper Shipping Name (e.g., Hazardous Waste Solid, n.o.s., 9, UN 3077, PG III (D008))
- Type and number of container
- Quantity of waste (volumetric estimate)
- CTO or job number
- Profile number
- 24-hour emergency phone number

Additionally, each shipment of waste will also have a haul/weight ticket. An LDR Notification/Certification is also required for hazardous wastes. This form also requires the generator signature and submission to the disposal facility.

The generator (Navy) and the transporter must sign the manifest prior to the load of waste leaving the site. A copy of the manifest will be retained on site and included with the daily Quality Control Report. The original signed manifest will be returned to the address of the generator. The facility will provide a copy of this signed manifest to CH2M HILL for the final report. The final report will include copies of the facility signed manifest, weight ticket, LDR (if applicable), and the Certificate of Disposal/Destruction/Recycle.

If the signed **hazardous** waste 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, in coordination with the Navy, will issue an "Exception Report" to the state of Florida, as required under 40 CFR 262.42.

4.4 Transportation

Trucks and containers used to transport contaminated waste offsite will be inspected for signs of deterioration and contamination *prior* to loading. Any truck or container with contents/residues or in poor condition will be rejected.

Each transportation vehicle and load of waste will be inspected before leaving the site and documented. The quantities of waste leaving the site will be documented, at a minimum on the T&D Log (Appendix C). A contractor licensed for commercial transportation will transport non-hazardous wastes. In the event that wastes are hazardous, the transporter will have a EPA Identification number, and will comply with transportation requirements outlined in 49 CFR 171-179 (DOT) and 40 CFR 263.11 and 263.31 (Hazardous Waste Transportation). A copy of the documentation indicating that the selected transporter has appropriate licenses will be received and approved by CH2M HILL prior to transport of any waste.

4.4.1 Transporter Responsibilities

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 to CH2M HILL. For drums, disposal quantities will be based on the number of drums picked up, transported and disposed of properly.

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 waste spilled in transit.
- Line and cover trucks/trailers used for hauling contaminated waste to prevent releases and contamination.
- Decontaminate vehicles prior to re-use, other than hauling contaminated waste.
- Seal trucks transporting liquids.

All personnel involved in offsite disposal activities will follow safety and spill response procedures outlined in the HSP (Appendix A).

No materials from other projects will be combined with materials from NAS Jacksonville.

4.5 Disposal

Offsite treatment, recycling or disposal facilities will use the waste profile and supporting documentation, such as analytical results, to determine if the facility will accept a waste. The treatment, recycling or disposal facility will be responsible for providing a copy of the final waste manifest and for a certificate of treatment or disposal for each load of waste received. Wastes are expected to be disposed as follows:

- Non-hazardous wastes will be disposed in a facility permitted to accept the types and quantities of contamination (for example, Subtitle D landfills). Petroleum contaminated soils and other solids will be sent to a Subtitle D, non-hazardous landfill.
- Petroleum-contaminated liquids will be sent to a qualified waste water treatment facility.
- LNAPL product and water will be sent to a qualified recycler.

The waste will generally be placed into lined, bermed, and covered stockpiles and drums and transported and disposed of offsite at an appropriate disposal facility based on generator knowledge and analytical results.

Uncontaminated or decontaminated construction and demolition debris may be sent to municipal landfills, or landfills designated for construction/demolition debris.

4.5.1 Transportation and Disposal Log

The T&D Log is used to track waste from generation to final disposition. Wastes will be logged into the T&D Log the day waste is generated and placed into containers.

Transportation of wastes will be inventoried the day of transportation from the site using the T&D Log. Final disposal will be documented on the T&D Log using the Certificate of Disposal. A copy of the T&D Log is provided in Appendix C.

5.0 Environmental Protection Plan

The Environmental Protection Plan provided in the NAS Jacksonville Basewide Work Plan (CH2M HILL, 2000) provides general information on the appropriate requirements to be adhered to during the performance of the work at NAS Jacksonville. The purpose of this plan is to provide specific requirements/procedures to protect the environment during investigation activities at the Gas Hill Fuel Farm.

5.1 Regulatory Drivers

Project activities at the Gas Hill Fuel Farm are regulated under the State of Florida's Petroleum Program. All solid/hazardous waste and media will be characterized and managed according to the requirements of Chapter 62-730 FAC, Hazardous Waste regulations. Management of petroleum contaminated wastes and excavation activities will comply with the provisions of Chapter 62-770 FAC, Petroleum Contamination Site Cleanup Criteria, as appropriate.

5.2 Spill Prevention and Control

The provisions for spill prevention and control establish minimum site requirements. Refer to the HSP (Appendix A) for emergency response procedures and further reporting requirements.

In the event of a 'release' of any potentially hazardous waste, chemical, or material, CH2M HILL will report any release of to the CO or designated representative as indicated in the HSP. The definition of release includes any "spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment or discarding of barrels, containers, and other closed containers)" of any potentially hazardous chemical, substance, and/or material. The HSP identifies the hazardous chemicals and materials anticipated to be used in work at NAS Jacksonville. The CH2M HILL Regulatory Compliance Manager will be contacted for questions on other chemicals and/or materials.

5.3 Spill Prevention

All fuel, chemical, and waste storage areas will be properly protected from onsite and offsite vehicle traffic. All tanks (including fuel storage and waste storage) must be equipped with secondary containment. These tanks must be inspected daily for signs of leaks. Accumulated water must be inspected for signs of contamination (e.g., product sheen, discoloration, and odor) before being discarded. Fire protection provisions outlined in the HSP (Appendix A) must be adhered to.

Chemical products must be properly stored, transferred, and used. Should chemical product use occur outside areas equipped with spill control materials, adequate spill control materials must be maintained at the local work area.

5.4 Spill Containment and Control

Spill control materials will be maintained in the support zone, at fuel storage and dispensing locations, and at waste storage areas. Incidental spills will be contained with sorbent and disposed of properly. Spilled materials must be immediately contained and controlled. Spill response procedures include:

- Immediately warn any nearby workers and notify supervisor.
- Assess the spill area to ensure that it is safe to respond.
- Evacuate area if spill presents an emergency.
- Ensure any nearby ignition sources are immediately eliminated.
- Stop source of spill.
- Establish site control for spill area.
- Contain and control spilled material through use of sorbent booms, pads, or other material.
- Use proper personal protective equipment in responding to spills.

5.5 Spill Cleanup and Removal

All spilled material, contaminated sorbent, and contaminated media will be cleaned up and removed as soon as possible. Contaminated spill material will be drummed, labeled, and properly stored until material is disposed of. Contaminated spill material will be managed as waste (see Section 4.0 Waste Management Plan) and disposed of according to applicable, federal, state, and local requirements.

5.6 Environmental Conditions Report

CH2M HILL conducted an environmental conditions survey in July 2007. The site has been graded to a mound that is approximately 10 feet above the surrounding area. The area is open with the surface covered in tall grass with some washouts occurring on the north side of the mound. Several groundwater monitoring wells are located on the outside of a paved road that surrounds the site at the toe of the slope of the mound. The area surrounding the site is grass covered and gently sloped on the east, south, and west sides with the north side adjacent to a heavily wooded area. Standing water was encountered on the south side of the site in the tall grassy areas. A system of drainage ditches circles the site and feeds a major ditch that runs eastward to the St. Johns River. A photo log that documents the environmental conditions report is presented in Appendix D.

6.0 Quality Control Plan

This Quality Control Plan details the quality administrators, the project organization, and the construction inspections associated with the work to be completed at the Gas Hill Fuel Farm, NAS Jacksonville.

The submittal register included in Appendix C, documents submittals in accordance with CH2M HILL's Contract Management Plan (2003). 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 (CO, NAS Jacksonville Environmental Facilities Department [in duplicate], etc.), the project site, and to the project file.

The project organization chart (Figure 6-1) 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 6-1.

6.1 Project QC Manager

The Project QC Manager for this project is Eric Davis. The appointment letter for Mr. Davis is included in Appendix C.

6.2 Testing Requirements

This section describes construction testing and environmental analysis laboratories and their certifications; environmental sampling and analysis, and test control. The Testing Plan and Log is provided in Appendix C.

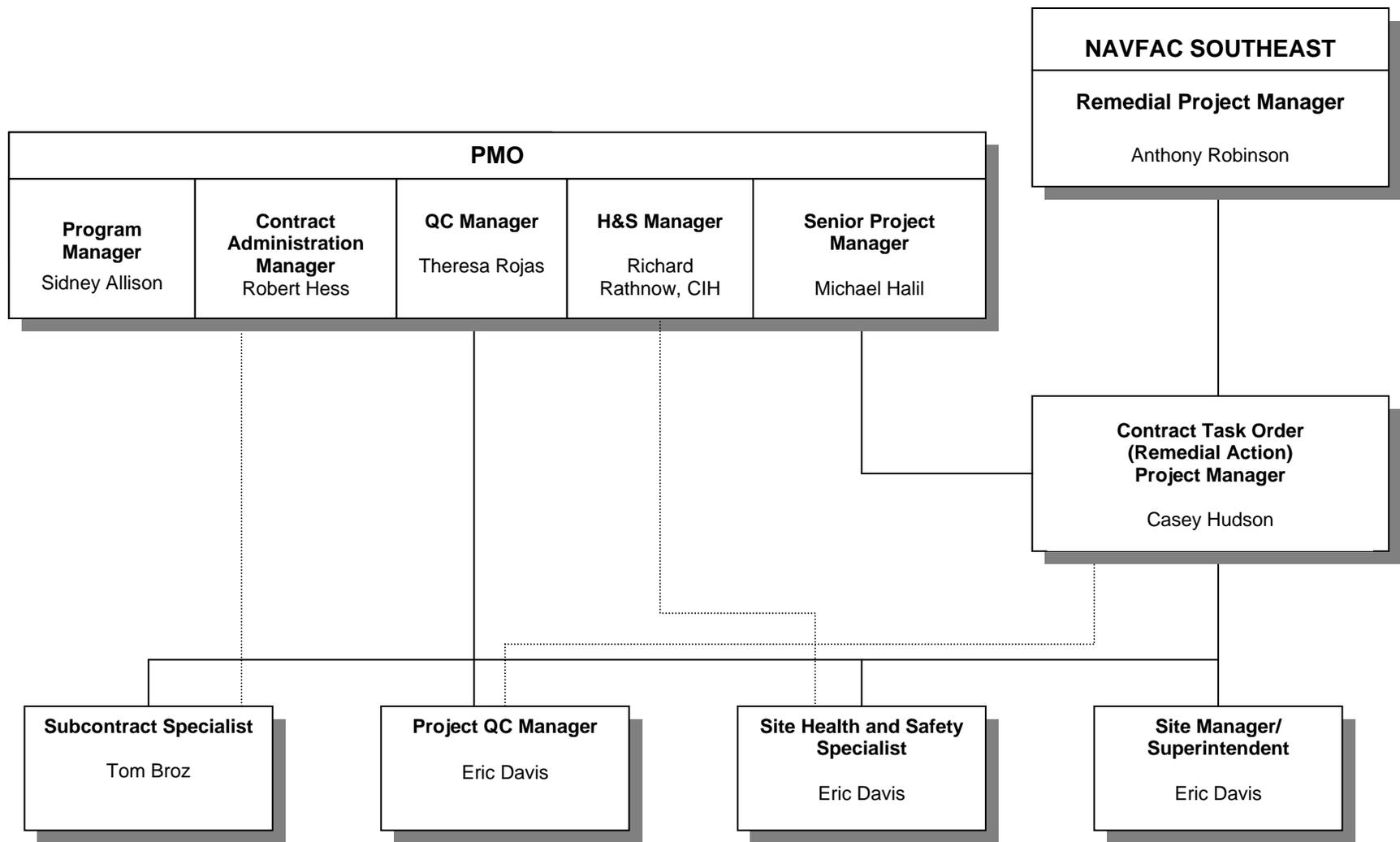
6.2.1 Identification and Certification of Testing Laboratories

The environmental testing laboratories utilized for this project will function as a subcontractor or a lower tier subcontractor, and have not yet been identified.

Laboratories performing analytical analysis of environmental samples will be approved by the Navy, USACE, or AFCEE, and FDEP. The selected laboratory will possess an approved Quality Assurance Project Plan.

6.3 Construction Inspections

The Project QC Manager will perform final inspections of the materials and overall work activities. The inspections are performed to verify safe, efficient, high quality work is performed, while meeting the objectives and requirements of the plans and specifications.



- Subcontractors
- T&D Coordinator (as needed)
- Project Assistant (as needed)
- Technical Support (as needed)

Figure 6-1
 Project Organization Chart
 Gas Hill Fuel Farm, Naval Air Station Jacksonville
 Jacksonville, Florida

TABLE 6-1
Roles, Responsibilities, and Authorities of Key Project Personnel
Gas Hill Fuel Farm, Naval Air Station Jacksonville
Jacksonville, Florida

Role	Responsibility	Authority
Project Manager	<ul style="list-style-type: none"> • Management and Technical Direction of work • Communication with Southern Division RPM and NTR • Overview 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 NAVFAC SE • 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 • Conduct QC meeting 	<ul style="list-style-type: none"> • Complete daily compliance report • 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"> • Approve subcontractor site specific health and safety plan • Set weekly safety objectives • Approve resumption of work for resolved safety issues

TABLE 6-1
Roles, Responsibilities, and Authorities of Key Project Personnel
Gas Hill Fuel Farm, Naval Air Station Jacksonville
Jacksonville, Florida

Role	Responsibility	Authority
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

6.4 Definable Features of Work

The project tasks for this CTO project are grouped into definable features of work, which are work activities that are significant to warrant distinct plans and specifications. The definable features of work for this project are:

- Mobilization, site preparation, and underground utility survey
- Soil and groundwater sample collection and analysis
- Monitoring well installation
- Surveying
- Decontamination and demobilization

The definable features of work will be inspected in accordance with the three phases of control. The three phases include preparatory, initial, and follow-up. An overview of the inspection provisions is outlined in the subsections that follow.

6.4.1 Mobilization, Site Preparation, and Underground Utility Survey

As part of the mobilization activity, a pre-construction meeting will be held to review the preparedness to begin the project, the overall project scope and schedule, communications and reporting. The preparedness check will verify that site preparation provisions such as permitting/approvals, utility clearances, demarcating the work zones, and staging of equipment and material, as needed, are in place to begin the intrusive work activities. Additionally, equipment and materials will be verified functional and in good working condition prior to starting the project.

Preparatory Phase

The preparatory phase will include a review of the relevant activity hazard analyses (AHAs), the Site Assessment Work Plan including the communications plan and project schedule, submittal status, and confirmation of appropriate materials and equipment are onsite or are in the process of mobilizing to the site.

Initial Phase

Inspections will be made as necessary to verify sampling locations are accessible using drilling equipment, utilities marked, and material staged in the designated areas.

Follow-up Phase

The Project QC Manager will provide oversight of site preparation activities to verify that the work is completed in accordance with the requirements provided in this Site Assessment Work Plan. Deficiencies will be noted and corrected.

Table 6-2 lists the quality controls that will be implemented during mobilization and site preparation activities.

TABLE 6-2
QC Procedures for Mobilization, Site Preparation, and Underground Utility Survey
Gas Hill Fuel Farm, Naval Air Station Jacksonville
Jacksonville, Florida

Task	Procedures/Construction Details
Pre-construction Meeting	<ul style="list-style-type: none"> • Verification of excavation permit and utility clearance from NAS Jacksonville Environmental Facilities Department • Verification of designated locations of equipment layout, material and waste staging, and decontamination
Site Walk	<ul style="list-style-type: none"> • Verification of site layout plan • Verification that sample locations are easily accessible by drilling equipment • Verification of 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"> • Verification of temporary facilities for conformance with NAS Jacksonville Environmental Facilities Department requirements • Verification of temporary utility hookups for conformance with the utility and the base requirements • Verify implementation of environmental protection measures, as needed

6.4.2 Soil and Groundwater Sample Collection and Analysis

CH2M HILL will sample soil and groundwater and send by overnight delivery to the offsite laboratory for analyses. Environmental samples will be collected in accordance with the SAP (Section 3.0). Other controls will include, but are not limited to, maintaining a COC; 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 (Section 3.0) of this Site Assessment Work 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.

Initial Phase

Samples will be collected and subsequently analyzed at an approved laboratory in accordance with methods outlined in the SAP (Section 3.0). Sample collection activities including proper COC documentation will follow the protocols outlined in the SAP of this Site Assessment Work Plan.

Follow-up Phase

Sample collection locations and activities will be properly documented during soil and groundwater collection activities. 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. Environmental samples will be collected in accordance with the SAP of this Site Assessment Work Plan.

Table 6-3 lists the quality controls that will be implemented during the soil and groundwater sample collection and analysis activities.

TABLE 6-3
QC Procedures for Soil and Groundwater Sample Collection and Analysis Activities
Gas Hill Fuel Farm, Naval Air Station Jacksonville
Jacksonville, Florida

Task	Procedures/Construction Details
Soil and Groundwater Sample Collection and Analysis	<ul style="list-style-type: none">• Verify laboratory and credentials• Verify appropriate sampling equipment• Verify equipment decontamination• Verify appropriate facilities, testing equipment, and DPT rig 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

6.4.3 Monitoring Well Installation

6.4.3.1 Preparatory Phase

The preparatory phase will include a review of the relevant AHAs, the requirements provided in the Site Assessment Work Plan, review of the proposed well installation plan and drawing, verification of utility clearance; confirmation of acceptability of well risers, screens, wellhead fittings and other required materials; and confirmation that appropriate equipment (PPE, water handling, etc.) and field personnel are available to complete the work. The oversight geologist will be identified, and the logistical approach to conducting the work will be discussed.

Prior to the commencement of any intrusive activity, site controls including construction barricades, roadway signs, and security fencing will be inspected and installed as necessary.

Initial Phase

Prior to well installation activities, the Project QC Manager will complete the initial inspection to verify that the well installation and development activities are being planned to meet the requirements of the scope of work. Deficiencies will be documented and corrected as necessary.

Follow-up Phase

The Project QC Manager will be responsible for the overall daily surveillance of the well installation activities. The daily surveillance will verify that the work is being completed according to the work plan provisions as necessary.

Table 6-4 lists the quality controls that will be implemented during well installation activities.

TABLE 6-4
QC Procedures for Monitoring Well Installation
Gas Hill Fuel Farm, Naval Air Station Jacksonville
Jacksonville, Florida

Task	Procedures/Construction Details
Monitoring Well Installation	<ul style="list-style-type: none"> • Verify driller's qualifications (licensed in the State of Florida) • Verify utility clearance • Verify appropriate equipment and materials • Verify installation per FDEP regulations • Well identification/labeling • Inspection of equipment and decontamination between wells • Verify completion of well completion logs and records • Verify well installation record submission • Verify appropriate means, methods and materials used to install the well. • Verify recording forms, including all of the test documentation requirements, have been prepared and are accurate and complete

6.4.4 Surveying

Preparatory Phase

The preparatory phase will include the following: a review of the relevant AHAs, a review of the requirements provided in this work plan and the site-specific HSP, and verify acceptance and approval of surveyor qualifications/license (Florida-registered professional land surveyor).

Initial Phase

As the activities proceed, the Project QC Manager will conduct initial inspections, verify existing monuments and structures, verify instrument calibration and accuracy, and monitor the work completed to verify conformity with this Site Assessment Work Plan. Deficiencies will be documented and corrected as necessary.

Follow-up Phase

The Project QC Manager will be responsible for the ongoing inspection of the site activities, verification of instrument calibration and accuracy, and surveillance will verify that the work is being completed according to this Site Assessment Work Plan. Deficiencies will be documented and corrected as necessary.

Table 6-5 lists the quality controls that will be implemented during surveying activities.

TABLE 6-5
 QC Procedures for Surveying
Gas Hill Fuel Farm, Naval Air Station Jacksonville
Jacksonville, Florida

Task	Procedures/Construction Details
Post - Investigation Site Surveying	<ul style="list-style-type: none"> • Surveyor qualifications / license (Florida -registered professional land surveyor) • Verification of existing monuments and structures • Instrument calibration and accuracy • Surveying tolerances (horizontal, vertical, contours) (Horizontal controls Mercator Projection , GRS 80, State Plane Coordinate System, North American Datum 1983, Lambert Zones 1-6 (or appropriate zone for region to be mapped)(Vertical controls mean sea level, North American Vertical Datum, 1988) • Reference to applicable plane coordinates and vertical datum, information collected in English units (Tri-Service Spatial Data Standards) • Survey documents surface/subsurface structure locations, locations and limits of subsurface piping investigation excavations, locations of discovered subsurface piping, locations of buried utilities, monitoring well locations, and any deviations • Electronic and hard copy data deliverables

6.4.5 Decontamination and Demobilization

Personnel and equipment utilized to perform intrusive work will be decontaminated in accordance with the provisions of the HSP. Pre-final inspection of cleanliness will be performed by the Site Superintendent and the Site Health and Safety Specialist. Final equipment inspections will be performed and documented by the Project QC Manager, or his/her designee.

Equipment and personnel will demobilize from the site following the completion of the work activities identified in this Site Assessment Work Plan. The Project QC Manager will verify that the objectives of associated investigation activities have been met. A final inspection will be conducted to verify completion of all project activities. Findings, should any be identified, will be tracked, resolved and documented during a final site walk through inspection.

Preparatory Phase

The preparatory phase will include a review of decontamination procedures, the site-specific HSP, Section 4.0 Waste Management Plan, and relevant AHAs.

Initial Phase

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

Follow-up Phase

The Project QC Manager will provide continuous oversight of the decontamination and demobilization to verify that the work is completed in accordance with the requirements provided in this Site Assessment Work Plan. Deficiencies will be noted and corrected.

Table 6-6 lists the quality controls that will be implemented during decontamination and demobilization activities.

TABLE 6-6
 QC Procedures for Decontamination and Demobilization
 Gas Hill Fuel Farm, Naval Air Station Jacksonville
 Jacksonville, Florida

Task	Procedures/Construction Details
Decontamination and Demobilization	<ul style="list-style-type: none"> • Pre-final site inspection and develop punch-list items • Work areas to ensure all temporary facilities, equipment and materials are safely removed from the site • Work areas to ensure project housekeeping and cleaning • Decontamination of personnel and equipment • Completion inspection when work is substantially complete • Punch lists on outstanding items • Project housekeeping and final project cleaning • Final Inspections • Orderly Site Demobilization • Collation of Site Records & Documents • Final Reports and Deliverables • Complete Resolution of Punch-list items • Final Site Inspection • Orderly Site Demobilization

7.0 References

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Appendix A

Health and Safety Plan

**Health and Safety Plan
Site Assessment at
Petroleum Contaminated Area 4
Gas Hill Fuel Farm
Naval Air Station Jacksonville
Jacksonville, Florida**

**Contract No. N62467-01-D-0331
Contract Task Order No. 0072**

Submitted to:



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

Prepared by:



Northpark 400
1000 Abernathy Road, Suite 1600
Atlanta, GA 30328

January 2008

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Attachments

- 1 Employee Signoff Form – Field Safety Instructions
- 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
NAS	Naval Air Station
NAVFAC SE	U.S. Navy Facilities Engineering Command Southeast
NDG	nuclear density gauge
NLI	Near Loss Investigation
NS	Naval Station
NSC	National Safety Council
NTR	Navy Technical Representative
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

RAP	Remedial Action Plan
RMSF	Rocky Mountain Spotted Fever
SAR	supplied-air respirator
SARA	Site Assessment Report Addendum
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) is 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: 0072

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

PROJECT/SITE NAME: Gas Hill Fuel Farm Soil and Groundwater Investigation
Naval Air Station Jacksonville, Jacksonville, Florida

SITE ADDRESS: Naval Air Station Jacksonville, Jacksonville, Florida

CH2M HILL PROJECT MANAGER: Casey Hudson

CH2M HILL OFFICE: ATL

DATE HEALTH AND SAFETY PLAN PREPARED: January 2008

DATE(S) OF SITE WORK: January 2008 – February 2008

SITE BACKGROUND AND SETTING:

CH2M HILL Constructors, Inc. (CH2M HILL) has been contracted by the U.S. Naval Facilities Engineering Command Southeast (NAVFAC SE), to conduct a Site Assessment under Response Action Contract (RAC) No. N62467-01-D-0331, Contract Task Order (CTO) No. 0072. The purpose of the Site Assessment is to further define the extent of hydrocarbons in the soil and groundwater resulting from past fuel storage activities at the former location of the Gas Hill Fuel Farm at NAS Jacksonville, Florida. The newly acquired data coupled with data obtained from previous environmental work will be used to prepare both a Site Assessment Report Addendum (SARA) and Remedial Action Plan (RAP) for the site.

DESCRIPTION OF SPECIFIC TASKS TO BE PERFORMED:

- Mobilization, site preparation, and completion of an underground utility survey
- Soil boring installation and collection of soil samples for chemical analysis
- Monitoring well installation and collection of groundwater samples for chemical analysis
- Surveying of newly installed borings, up to 10 previously installed wells, and the topography of Gas Hill area
- Characterization, containerization, transportation, and disposal (T&D) of contaminated waste
- Decontamination and demobilization

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

- Mobilize personnel, equipment, materials, and other resources to the site
- Soil boring installation and collection of soil samples for chemical analysis
- Monitoring well installation and collection of groundwater samples for chemical analysis
- Characterization, containerization, transportation, and disposal (T&D) of contaminated waste
- Decontamination and demobilization

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 of work plan and reports• Surveying of newly installed borings, up to 10 previously installed wells, and the topography of Gas Hill Fuel Farm area	<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					
	Mobilize personnel, equipment, materials, and other resources to the site	Install groundwater monitoring well	Perform soil borings	Surveying of newly installed borings	Characterization, Containment, T&D of Waste	Decon and Demobe
Manual Lifting (HS-29)	X	X	X	X	X	X
Fire Prevention (HS-22)		X	X			
Electrical Safety (HS-23)		X	X			
Lockout /Tagout (HS-33)		X	X			
Ladders & Stairs(HS-25)	X					
Compressed Gas Cylinders (HS-63)						
Buried Utilities		X	X			
Excavations (HS-32)		X	X			
Fall Protection (HS-31)						
Heavy Equipment (HS-27)	X	X	X		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	X
Forklifts (HS-48)						
Drilling (HS_35)		X	X			
Noise (HS-39)	X	X	X		X	
Pressurized Lines/Equipment						
Pressure Washing/Equip Decon						
Vacuum Truck/Pumping Operations						
Suspended Loads		X	X		X	
Vehicle Traffic	X					
Haul Truck Operations					X	
Visible Lighting	X	X	X	X	X	X
Mechanical Guarding Hazards		X	X			
Asbestos Hazard						
Lead Hazard						
Chemical Hazard-Dermal/Inhalation	X	X	X		X	
Dust Hazard (Silica/Metals)						
Fire/Explosion Hazards		X	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 are 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 (AHA) 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 Site Health and Safety Specialist (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 Drilling Safety

- The drill rig is not to be operated in inclement weather.
- The driller is to verify that the rig is properly leveled and stabilized before raising the mast.
- Personnel should be cleared from the sides and rear of the rig before the mast is raised.

- The driller is not to drive the rig with the mast in the raised position.
- The driller must check for overhead power lines before raising the mast. A minimum distance of 15 feet between mast and overhead lines (<50 kV) is recommended. Increased separation may be required for lines greater than 50 kV.
- Personnel should stand clear before rig startup.
- The driller is to verify that the rig is in neutral when the operator is not at the controls.
- Become familiar with the hazards associated with the drilling method used (cable tool, air rotary, hollow-stem auger, etc.).
- Do not wear loose-fitting clothing, watches, etc., that could get caught in moving parts.
- Do not smoke or permit other spark-producing equipment around the drill rig.
- The drill rig must be equipped with a kill wire or switch, and personnel are to be informed of its location.
- Be aware and stand clear of heavy objects that are hoisted overhead.
- The driller is to verify that the rig is properly maintained in accordance with the drilling company's maintenance program.
- The driller is to verify that all machine guards are in place while the rig is in operation.
- The driller is responsible for housekeeping (maintaining a clean work area).
- The drill rig should be equipped with at least one fire extinguisher.

If the drill rig comes into contact with electrical wires and becomes electrically energized, do not touch any part of the rig or any person in contact with the rig, and stay as far away as possible. Notify emergency personnel immediately.

3.1.2 Welding/Cutting with Compressed Gas Cylinders

(Reference CH2M HILL, SOP HS-22, *Welding and Cutting*)

- Complete hot work permit.
- Wear appropriate personal protective equipment.
- Remove or combustible materials in the immediate hot work area.
- Station fire watch with fire extinguisher.
- Valve caps must be in place when cylinders are transported, moved, or stored.
- Cylinder valves must be closed when cylinders are not being used and when cylinders are being moved.
- Cylinders must be secured in an upright position at all times.

- Cylinders must be positioned to avoid being struck or knock over; coming in contact with electrical circuits or extreme heat sources; and shielded from welding and cutting operations.
- Cylinders must be secured on a cradle, basket or pallet when hoisted; they may not be hoisted by choker slings.

3.1.3 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.

3.1.4 Excavation Activities

(Reference CH2M HILL, SOP HS-32, *Excavation and Trenching*)

- CH2M HILL personnel must notify and be granted authorization from the excavation competent person prior to entering any excavation. CH2M HILL personnel must follow all excavation requirements established by the competent person.
- The competent person must inspect the trench and/or excavation everyday and after everyday hazard increasing event. Documentation of this inspection must be maintained onsite at all times.
- Excavations must be protected from cave-ins by adequate protective systems unless the excavation is less than 5 feet in depth and a competent person determines there is no indication of cave-in or the excavation is made entirely in stable rock that is not fractured.
- Prior to excavating at a location, buried utilities in the area must be identified; refer to Section 2.2.8 "Procedures for locating buried utilities".

- CH2M HILL personnel must not enter any excavation where protective systems are deficient at any time, for any reason. The competent person must be notified of such conditions.
- Refer to CH2M HILL SOP HS-32 "Excavations and Trenching" for more specific details on excavation requirements.

3.1.5 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 and 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, linelines, 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.

3.1.6 Forklift Operations

Forklifts may be required for materials movement during project activities. Forklifts present the potential for damage to equipment, materials and personnel by impaling or striking personnel or materials with the forklift tines. Additionally, forklifts may tip if they are incorrectly loaded, driven at excessive speeds or operated with the forks too high.

The following rules apply whenever a forklift is used on the project:

- A rated lifting capacity must be posted in a location readily visible to the operator.
- A forklift truck must not be used to elevate employees unless a platform with guardrails, a back guard, and a kill switch is provided on the vehicle. When guardrails are not possible, fall arrest protection is required.
- The subcontractor operating the forklift must post and enforce a set of operating rules for forklift trucks.
- Only trained and authorized drivers will operate forklifts.
- Stunt driving and horseplay are prohibited.
- Employees must not ride on the forks.
- Employees must never be permitted under the forks (unless forks are blocked).
- The driver must inspect the forklift once a shift and document this inspection.
- The operator must look in the direction of travel and must not move the vehicle until all persons are clear of the vehicle.
- Forks must be carried as low as possible.
- The operator must lower the forks, shut off the engine, and set the brakes (or block the wheels) before leaving the forklift operator's position unless maintenance or safety inspections require the forklift to be running.
- Trucks must be blocked and have brakes set when forklifts are driven onto their beds.

- Extreme care must be taken when tilting elevated loads.
- Every forklift must have operable brakes capable of safely stopping it when fully loaded.
- Forklifts must have parking brakes and an operable horn.
- When the operator is exposed to possible falling objects, industrial trucks must be equipped with overhead protection (canopy).

3.1.7 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.

3.2.10 Compressed Gas Cylinders

- Valve caps must be in place when cylinders are transported, moved, or stored.
- Cylinder valves must be closed when cylinders are not being used and when cylinders are being moved.
- Cylinders must be secured in an upright position at all times.
- Cylinders must be shielded from welding and cutting operations and positioned to avoid being struck or knocked over; contacting electrical circuits; or exposed to extreme heat sources.
- Cylinders must be secured on a cradle, basket, or pallet when hoisted; they may not be hoisted by choker slings.

3.2.11 Procedures for Locating Buried Utilities

Underground Utilities

Do not begin subsurface construction activities (e.g., trenching, excavation, drilling, etc.) until a check for underground utilities and similar obstructions has been conducted. The use of as-built drawings and utility company searches must be supplemented with a geophysical or other survey by a qualified, independent survey contractor to identify additional and undiscovered buried utilities.

Examples of the type of geophysical technologies include:

- **Ground Penetrating Radar (GPR)**, which can detect pipes, including gas pipes, tanks, conduits, cables etc, both metallic and non-metallic at depths up to 30 feet depending on equipment. Sensitivity for both minimum object size and maximum depth detectable depends on equipment selected, soil conditions, etc.
- **Radio Frequency (RF)**, involves inducing an RF signal in the pipe or cable and using a receiver to trace it. Some electric and telephone lines emit RF naturally and can be detected without an induced signal. This method requires knowing where the conductive utility can be accessed to induce RF field if necessary.
- **Dual RF**, a modified version of RF detection using multiple frequencies to enhance sensitivity but with similar limitations to RF
- **Ferromagnetic Detectors** are metal detectors that will detect ferrous and non-ferrous utilities. Sensitivity is limited, e.g. a 100 mm iron disk to a depth of about one meter or a 25 mm steel paper clip to a depth of about 20 cm.
- **Electronic markers** are emerging technologies that impart a unique electronic signature to materials such as polyethylene pipe to facilitate location and tracing after installation. Promising for future installations but not of help for most existing utilities already in place.

Procedure

The following procedures shall be used to identify and mark underground utilities during subsurface construction activities on the project:

- The survey contractor shall determine the most appropriate geophysical technique or combinations of techniques to identify the buried utilities on the project, based on the survey contractor's experience and expertise, types of utilities anticipated to be present and specific site conditions.
- The survey contractor shall employ the same geophysical techniques used on the project to identify the buried utilities, to survey the proposed path of subsurface construction work to confirm no buried utilities are present.
- Identify customer specific permit and/or procedural requirements for excavation and drilling activities. For military installations contact the Base Civil Engineer and obtain the appropriate form to begin the clearance process.
- Contact utility companies or the state/regional utility protection service at least two (2) working days prior to excavation activities to advise of the proposed work, and ask them to establish the location of the utility underground installations prior to the start of actual excavation.
- Schedule the independent survey.
- Obtain utility clearances for subsurface work on both public and private property.
- Clearances are to be in writing, signed by the party conducting the clearance.
- Underground utility locations must be physically verified by hand digging using wood or fiberglass-handled tools when any adjacent subsurface construction activity (e.g. mechanical drilling, excavating) work is expected to come within 5 feet of the marked underground system. If subsurface construction activity is within 5 feet and parallel to a marked existing utility, the utility location must be exposed and verified by hand digging every 100 feet.
- Protect and preserve the markings of approximate locations of facilities until the markings are no longer required for safe and proper excavations. If the markings of utility locations are destroyed or removed before excavation commences or is completed, the Project Manager must notify the utility company or utility protection service to inform them that the markings have been destroyed.
- Conduct a site briefing for employees regarding the hazards associated with working near the utilities and the means by which the operation will maintain a safe working environment. Detail the method used to isolate the utility and the hazards presented by breaching the isolation..
- Monitor for signs of utilities during advancement of intrusive work (e.g., sudden change in advancement of auger or split spoon during drilling or change in color, texture or density during excavation that could indicate the ground has been previously disturbed).

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)
Diesel Range Organics	GW: 131 SB: SB07 SS: 4,830	100 mg/m ³ (REL)	NL	Primary system effect is CHS depression. Inhalation of vapors may cause nausea, confusion, drowsiness, convulsions, and coma. Liquid may cause skin and eye irritation.	UK
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).

3.7 Adverse Weather

Sudden inclement weather can encroach on unprepared samplers in the field. Field crew members shall carry clothing appropriate for bad weather. In severe weather conditions, (i.e., high wind or electrical storms), the field crews should leave the area and find shelter until the weather abates and field activities can continue or until a decision is made to halt the field activities.

Preparedness and precaution are the best defenses against lightning. Many lightning deaths and injuries happen before or after a thunderstorm's peak. The SSHS shall monitor weather forecasts for predictions of electrical storms in the area. At first sight of lightning, operations shall be stopped and only resumed when conditions permit. The SSHS shall monitor weather conditions to determine when it is appropriate to resume work. The lightning safety recommendation is 30-30: Seek refuge when thunder sounds within 30 seconds after a lightning flash; and do not resume activity until 30 minutes after the last thunder clap.

Other precautions include:

- Know where to go and how long it will take to get there. If possible, take refuge in a large building or vehicle. Do not go into a shed in an open area.

- The inclination to see trees as enormous umbrellas is the most frequent and most deadly mistake. Do not go under a large tree that is standing alone. Likewise, avoid poles, antennae and towers.
- Stay away from lakes, streams, pools, or any water.
- Stay away from railroad tracks that can carry lightning charges for long distances.
- If the area is wide open, go to a valley or ravine, but be aware of flash flooding. Do not stand on top of a hill.
- If you are caught in a level area such as a prairie or field during an electrical storm, and you feel your hair stand on end, drop to your knees, bend forward and put your hands on your knees or crouch. The idea is to make yourself less vulnerable by being as low to the ground as possible and taking up as little ground space as possible. Lying down is dangerous, since the wet earth can conduct electricity. Do not touch the ground with your hands.
- Do not use telephones during electrical storms, except in the case of emergency.

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
Casey Hudson	ATL	Project Manager	SHSS/FA-CPR
Rich Rathnow	ORO	HSM	SC-C; SC-HW, FA-CPR

4.2 Field Team Chain of Command and Communication Procedures

4.2.1 Client

Client: Dudley Patrick, RPM

Richard Stanley, Contracting Officer (843) 820-5939

Dorothy Okamoto, COTR (843) 820-5940

4.2.2 CH2M HILL

Program Manager: Sidney Allison/ATL (770) 604-9095

Project Manager: Casey Hudson/ATL (770) 604-9095

Health and Safety Manager: Richard Rathnow/KNV (865) 560-2908

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

	Level		Head	Respirator ^b
General site entry	D	Work clothes; steel-toe, leather work boots; work glove.	Hardhat ^c Safety glasses Ear protection ^d	None required
Oversight of remediation and construction				
Mobilize personnel, equipment, materials, and other resources to the site				
Demobilization				
Groundwater sampling	Modified D	Work clothes or cotton coveralls 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	None required
Surveying of newly installed borings, up to 10 previously installed wells, and the topography of Gas Hill Fuel Farm area				
Install three new groundwater monitoring wells	Modified D	Coveralls: Uncoated 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 Safety glasses Ear protection ^d	None required.
Perform three soil borings to 140 ft bls				
Monitoring well installation and collection of groundwater samples for chemical analysis				
Characterization, containerization, transportation, and disposal (T&D) of contaminated waste				
Decontamination				
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.

TABLE 5-1
PPE Specifications^a

Level	Head	Respirator ^b
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 decrease 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	All intrusive operations	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: collect benzene tube; benzene action level not exceeded		
		> 25 ppm	Level B: Contact HSM		
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	All Intrusive Activities	<0.5 ppm	Level D	Initially and periodically when PID/FIB >1 ppm	Not applicable
		0.5-1 ppm	Level C		
		>1 ppm	Level B		
Noise-Level Monitor^e:		<85 dB(A)	No action required	Initially and periodically during task	Daily
		85-120 dB(A)	Hearing protection required		
		120 dB(A)	Stop; re-evaluate		

^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 \pm 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.

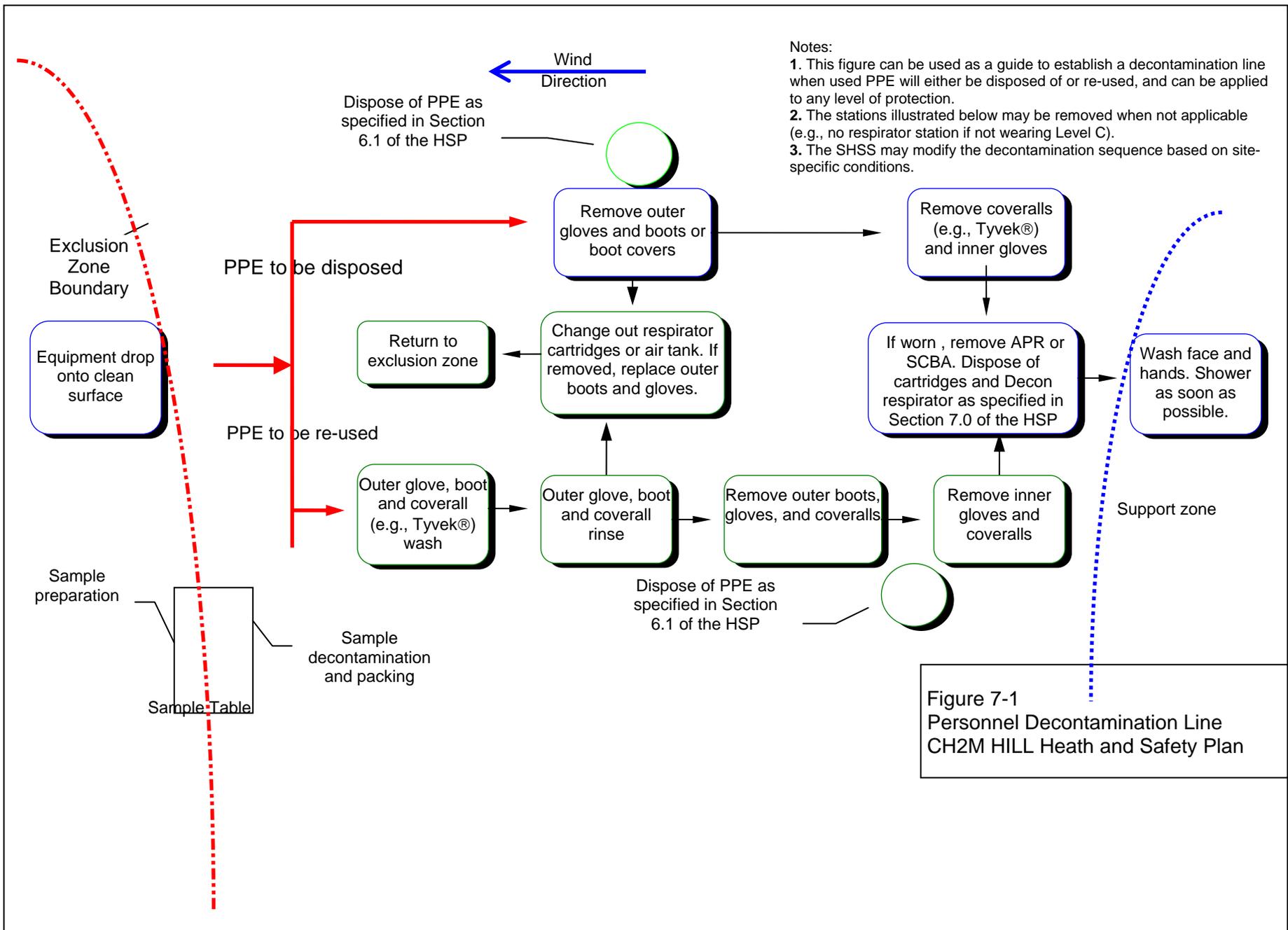
7.1 Decontamination Specifications

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.



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 Southern Division, NAVFAC Contracting Officer and Navy Technical Representative (NTR) shall 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 reportability 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, Program Manager Scott Newman/ATL, or CH2M HILL Corporate HSM Angelo Liberatore/ATL 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, 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

- If you are injured at work, notify your supervisor immediately and contact the Injury Management/Return-to-Work toll free number (for US and Puerto Rico) 1-800-756-1130. All supervisors must contact their Human Resources Representative and complete the employee injury/illness in the Incident Report Form (IRF) in the HITS database within 24 hours of the incident
- Immediately notify the Project Manager (PM), Emergency Response Coordinator (ERC), and/or Responsible Health and Safety Manager (RHSM) for any project incident (fire, spill/release, injury/illness, near miss, property damage, or security-related)
- Report any serious incidents (life-threatening injury/illness, death, kidnap/missing person, terrorism, property damage greater than \$500K, significant environmental release) immediately to your ERC, PM, or RHSM. The Serious Incident Reporting number is 720-286-4911.
- For serious incidents, the Corporate Legal Department will determine who completes the IRF.
- For CH2M HILL subcontractor incidents, immediately notify the SSHS and HSM to complete and submit an IRF.
- The RHSM will inform the Responsible Environmental Manager (REM) of any environmental incidents.
- Incident Investigations must be initiated and completed as soon as possible but no later than 72 hours after the incident.
- 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 that 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 are 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.

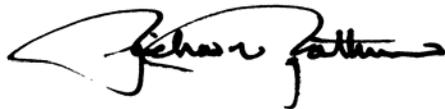
12.1 Original Plan

Written By: David Chung/ATL

Date:11-07

Approved By: Rich Rathnow/KNV

Date:11-16-07



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 #: 911
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 #: 911
Local Fire Dept #:

Local Occupational Physician

Security & Police – 911

Facility Security #: 911
Local Police #:

Navy RAC Program Manager

Name: Sidney Allison/ATL
Phone: 770/604/9182

Utilities Emergency

Water:
Gas:
Electric:

Navy RAC Health and Safety Manager (HSM)

Name: Rich Rathnow/ORO
Phone: 865/483-9005 (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: Casey Hudson/ATL:
Phone: 678/530-4172

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: NA

Evacuation Assembly Area(s):

Facility/Site Evacuation Route(s):

Hospital Name/Address:
Baptist Medical Center

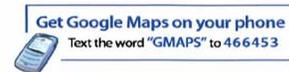
Hospital Phone #: (904) 202-2000

Directions to Hospital

Driving directions from NAS Jacksonville to Baptist Medical Center are as follows:



Start **Jacksonville NAS**
Jacksonville NAS station
End **Baptist Medical Center-ER**
800 Prudential Dr, Jacksonville, FL
32207
Travel **11.3 mi – about 24 mins**



A **Jacksonville NAS**
Jacksonville NAS station

Drive: 11.3 mi – about 24 mins

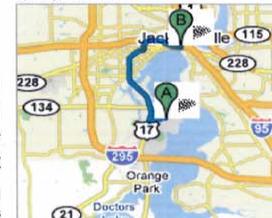
1. Head **northwest**
- ← 2. Turn **left** toward **Albermarle Ave**
- 3. Turn **right** at **Albermarle Ave**
- 4. Turn **right** at **Roosevelt Blvd**
- 5. Turn **right** at **Roosevelt Blvd/US-17 N**
- 6. Slight **right** at **Roosevelt Expy**
7. Take the exit onto **I-10 E**
8. Take the exit onto **I-95 S** toward **Jax Beaches/Daytona Beach**
9. Take exit **350B** toward **San Marco Blvd**
- ← 10. Turn **left** at **Palm Ave**
- ← 11. Turn **left** at **Prudential Dr**

B **Baptist Medical Center-ER**
800 Prudential Dr, Jacksonville, FL 32207

These directions are for planning purposes only. You may find that construction projects, traffic, or other events may cause road conditions to differ from the map results.

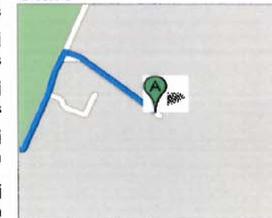
Map data ©2007 NAVTEQ™

Overview



0.2 mi
1.1 mi
3 mins
177 ft
0.6 mi
2 mins

Start



5.7 mi
10 mins
0.9 mi
2 mins
1.2 mi
2 mins
1.0 mi
1 min

End



0.4 mi
1 min
0.2 mi
1 min
0.1 mi
1 min

Map data ©2007 NAVTEQ™

Attachment 5

Project Activity Self-Assessment Checklists/Permits

**Drilling
Hand and Power Tools**

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 potentially exposed to hazards associated with drilling operations (complete Sections 1 and 3), and/or 2) CH2M HILL oversight of a drilling subcontractor is required (complete entire checklist).

SC may consult with drilling subcontractors when completing this checklist, but shall not direct the means and methods of drilling operations nor direct the details of corrective actions. Drilling 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 health and safety manager for review.

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

This specific checklist has been completed to:

Evaluate CH2M HILL employee exposures to drilling hazards
 Evaluate a CH2M HILL subcontractor’s compliance with drilling HS&E 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 drilling 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-35.

<u>SECTION 1</u>	<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>N/O</u>
PERSONNEL SAFE WORK PRACTICES (3.1)				
1. Only authorized personnel operating drill rig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Personnel cleared during rig startup	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Personnel clear of rotating parts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Personnel not positioned under hoisted loads	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Loose clothing and jewelry removed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Personnel instructed not to approach equipment that has become electrically energized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Smoking is prohibited around drilling operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Personnel wearing appropriate PPE, per HSP/FSI	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<u>SECTION 2</u>	<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>N/O</u>
GENERAL (3.2.1)				
9. Aquifer evaluated for contamination, sole source and wellhead protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Daily safety briefing/meeting conducted with crew	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Daily inspection of drill rig and equipment conducted before use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRILL RIG PLACEMENT (3.2.2)				
12. Location of underground utilities identified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Safe clearance distance maintained from overhead powerlines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Drilling pad established, when necessary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Drill rig leveled and stabilized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRILL RIG TRAVEL (3.2.3)				
16. Rig shut down and mast lowered and secured prior to rig movement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Tools and equipment secured prior to rig movement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Only personnel seated in cab are riding on rig during movement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Safe clearance distance maintained while traveling under overhead powerlines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Backup alarm or spotter used when backing rig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRILL RIG OPERATION (3.2.4)				
21. Kill switch clearly identified and operational	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. All machine guards are in place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Rig ropes not wrapped around body parts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Pressurized lines and hoses secured from whipping hazards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Drill operation stopped during inclement weather	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Air monitoring conducted per HSP/FSI for hazardous atmospheres	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Rig placed in neutral when operator not at controls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRILL RIG MAINTENANCE (3.2.5)				
28. Defective components repaired immediately	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Lockout/tagout procedures used prior to maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Cathead in clean, sound condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Drill rig ropes in clean, sound condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Fall protection used for fall exposures of 6 feet or greater	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Rig in neutral and augers stopped rotating before cleaning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. Good housekeeping maintained on and around rig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRILLING WASTE MANAGEMENT (3.2.6)				
35. Drill cuttings and purge water managed and disposed properly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRILLING AT HAZARDOUS WASTE SITES (3.2.7)				
36. Waste disposed of according to HSP and RCRA regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. Appropriate decontamination procedures being followed, per HSP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FORMS/PERMITS (3.3)				
38. Driller license/certification and drill rig permit obtained	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. Well development/abandonment notifications and logs submitted and in project files	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. Water withdrawal permit obtained, where required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. Dig permit obtained, where required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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"/> |

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

FieldNotes: _____

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

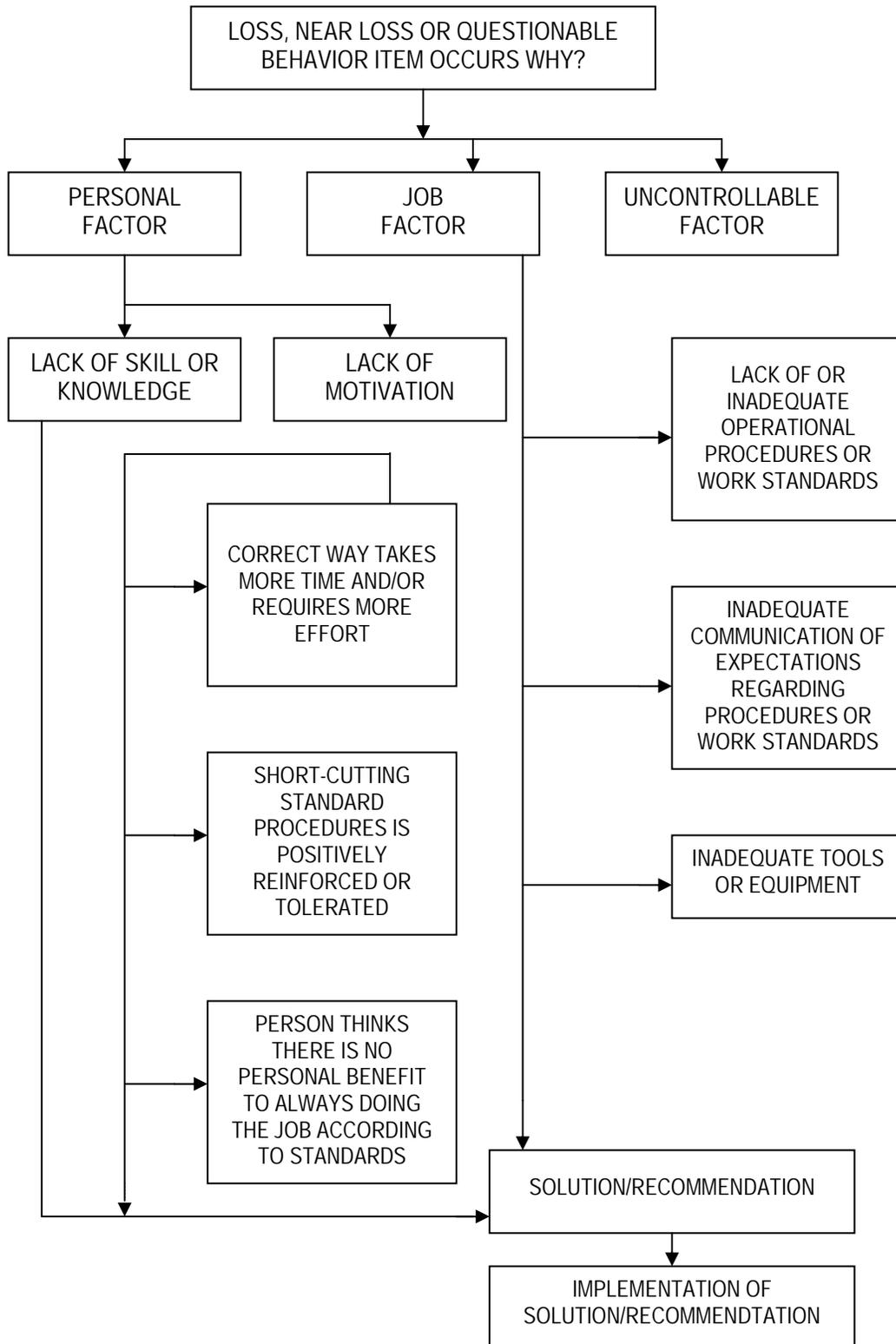
Name	Job Title	Date

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 B

Project Schedule

Activity ID	WBS	% Comp	Activity Description	Orig 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	M	J	J	A	S			

CTO #0072 - NAS JACKSONVILLE, FL

Total		1		451	322	26JUN07A	03APR09																								
-------	--	---	--	-----	-----	----------	---------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

PHASE 3

PROJECT MANAGEMENT

Subtotal	PA.01.01.01	23		415	322	26JUN07A	03APR09																								
----------	-------------	----	--	-----	-----	----------	---------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

PROJECT MANAGEMENT

CIPA010101	PA.01.01.01	23	PMO	415	322	26JUN07A	03APR09																								
------------	-------------	----	-----	-----	-----	----------	---------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

GAS HILL SOURCE REMOVAL

Subtotal		0		273	273	10MAR08	03APR09																								
----------	--	---	--	-----	-----	---------	---------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

PROJECT MANAGEMENT

CI99220101	99.22.01.01	0	CCI Project Mgmnt, Field	123	123	10MAR08	29AUG08																								
CI99220102	99.22.01.02	0	CCI Management Office, On-site	123	123	10MAR08	29AUG08																								
CI99220103	99.22.01.03	0	CCI Management Office, Off-site	273	273	10MAR08*	03APR09																								

MOBILIZATION & PREPARATORY WORK

CI31010390	31.01.03.90	0	SARA	60	60	10MAR08	02JUN08																								
CI31010392	31.01.03.92	0	RAP	60	60	10MAR08	02JUN08																								

SURVEYING

CI31220410	31.22.04.10	0	Surveying	126	126	17MAR08	11SEP08																								
------------	-------------	---	-----------	-----	-----	---------	---------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

SAMPLING & ANALYSIS

CI31020602	31.02.06.02	0	Sub-Surface Soil Sampling	10	10	10MAR08	21MAR08																								
CI31020902	31.02.09.02	0	Soil Investigation Analysis	10	10	10MAR08	21MAR08																								
CI31020502	31.02.05.02	0	Sampling Groundwater	204	204	17MAR08	05JAN09																								
CI31020901	31.02.09.01	0	Groundwater Analysis	225	225	18MAR08	04FEB09																								
CI31020905	31.02.09.05	0	Waste Characterization	225	225	18MAR08	04FEB09																								
CI31021491	31.02.14.91	0	Data Evaluation & Management	225	225	18MAR08	04FEB09																								
CI31020904	31.02.09.04	0	Clean Backfill Analysis	5	5	11AUG08	15AUG08																								
CI31020903	31.02.09.03	0	Confirmatory Analysis	9	9	02SEP08	12SEP08																								

SOLIDS COLLECTION & CONTAINMENT

CI31080102	31.08.01.02	0	Soil Removal	10	10	18AUG08	29AUG08																								
------------	-------------	---	--------------	----	----	---------	---------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TRANSPORTATION AND DISPOSAL

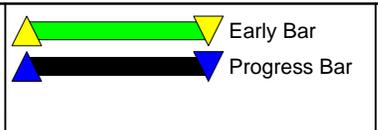
CI31192201	31.19.22.01	0	Disposal of Non-Haz Soil	225	225	17MAR08	03FEB09																								
CI31192202	31.19.22.01	0	T&D Non-Haz Liquids	225	225	17MAR08	03FEB09																								

REPORTING

CI31210606	31.21.06.06	0	Annual GW Monitoring	202	202	17MAR08	31DEC08																								
CI31210605	31.21.06.05	0	Soil Removal Report	45	45	15SEP08	14NOV08																								



Start Date	15JUN07		Early Bar
Finish Date	03APR09		Early Bar
Data Date	29DEC07		Progress Bar
Run Date	28JAN08 15:03		



C072 Sheet 1 of 1

CTO #0072 - NAS JACKSONVILLE, FL
CTO COMPLETION SCHEDULE
NAVY RAC SOUTHERN DIVISION



Appendix C

Project Quality Control Documents



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

January 31, 2008

Mr. Eric Davis
CH2M HILL Constructors, Inc.
Northpark 400
1000 Abernathy Road
Atlanta, Georgia 30328

RE: Contract No. N62467-01-D-0331
Contract Task Order No. 0072
Naval Air Station (NAS) Jacksonville – Jacksonville, Florida
Project Quality Control Manager Letter of Appointment

Dear Mr. Davis:

Herein describes the responsibilities and authority delegated to you in your capacity as the Project QC Manager at NAS Jacksonville, Contract Task Order (CTO) No. 0072 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: Project File No. 361486

Testing Plan and Log

CH2M HILL Constructors, Inc.

Contract Number: N62467-01-D-0331		CTO No.: 0072		CTO Title: Gas Hill Fuel Farm - Site Investigation				Location: Jacksonville, Florida		
A	B	C	D	E	F	G	H	I	J	K
Spec Section and Paragraph	Test Required	Proposed Lab	Sampled By	Tested By	Test Location	Frequency	Date Test Made	Test Results	Date Results Forwarded	Remarks
Groundwater Monitoring Samples	See Table 3-2				At each of the 7 new monitoring well locations and 3 existing monitoring well locations	Quarterly for one year				
Soil Samples	See Table 3-2				10 surface and 10 subsurface soil locations	Once				
Characterization of Soil Wastes	See Table 3-2				Soil from soil sampling and monitoring well installation	One grab for every 20 drums				
Characterization of Liquid Wastes	See Table 3-2				Aqueous material disposal	One grab for every 20 drums				

CH2M HILL SOUTH DIV RAC N62467-01-D-0331	<h2 style="margin: 0;">CONTRACTOR PRODUCTION REPORT</h2>	DATE OF REPORT: REVISION NO: REVISION DATE:			
CTO NO:	PROJECT NAME/LOCATION:	REPORT NO:			
WORK PERFORMED TODAY					
EMPLOYEE	WORK PERFORMED	EMPLOYER	EMPLOYEE NUMBER	TITLE/TRADE	HRS
Total For Today					
<i>INCLUDE ALL PERSONNEL WORK HOURS IN THE TOTAL WORK HOURS ON JOB SITE</i>					
SAFETY REQUIREMENTS HAVE BEEN MET <input checked="" type="checkbox"/>					
_____ SUPERINTENDENT'S SIGNATURE				_____ DATE	

CH2M HILL SOUTH DIV RAC N62467-01-D-0331	CONTRACTOR QUALITY CONTROL REPORT (ATTACH ADDITIONAL SHEETS IF NECESSARY)	DATE OF REPORT: REVISION NO: REVISION DATE:		
CTO NO: 00	PROJECT NAME/LOCATION:	REPORT NO:		
PROJECT NO:	PROJECT QC MANAGER:	SITE H&S SPECIALIST:		
SAFETY MEETINGS AND INSPECTIONS				
WAS A SAFETY MEETING HELD THIS DAY?	<input checked="" 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 checked="" 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 checked="" 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		
1	Initial <input type="checkbox"/> Follow up <input type="checkbox"/>			
2	Initial <input type="checkbox"/> Follow up <input type="checkbox"/>			
3	Initial <input type="checkbox"/> Follow up <input type="checkbox"/>			
4	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"/>			
	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)				DATE OF REPORT: REVISION NO: REVISION DATE:	
CTO NO:		PROJECT NAME/LOCATION:				REPORT NO:	
PROJECT NO:		PROJECT QC MANAGER:			SITE H&S SPECIALIST:		
SAMPLING/TESTING PERFORMED							
SAMPLING/TESTING PERFORMED		SAMPLING/TESTING COMPANY			SAMPLING/TESTING PERSONNEL		
N/A							
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: None.							
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: Not on location to perform inspection of rolloff							
TRANSPORTATION AND DISPOSAL ACTIVITIES/SUMMARY/QUANTITIES: None.							
GENERAL COMMENTS (rework, directives, etc.): Visitors:							
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.): None.							
<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>							
				PROJECT QC MANAGER'S SIGNATURE		DATE	
<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>							
				PROJECT QC MANAGER'S SIGNATURE		DATE	

CH2M HILL SOUTH DIV RAC IV	PREPARATORY PHASE REPORT	REPORT NO:	DATE:	CTO NO:
PROJECT NO:	DEFINABLE FEATURE OF WORK:	SITE/ACTIVITY:		
PERSONNEL PRESENT	GOVERNMENT REP NOTIFIED _____ HOURS IN ADVANCE: YES <input type="checkbox"/> NO <input type="checkbox"/>			
	NAME	POSITION	COMPANY/GOVERNMENT	
SUBMITTALS	REVIEW SUBMITTALS AND/OR SUBMITTAL REGISTER.		HAVE ALL SUBMITTALS BEEN APPROVED? YES <input type="checkbox"/> NO <input type="checkbox"/>	
	IF NO, WHAT ITEMS HAVE NOT BEEN SUBMITTED?			
	ARE ALL MATERIALS ON HAND? YES <input type="checkbox"/> NO <input type="checkbox"/>			
	IF NO, WHAT ITEMS ARE MISSING?			
MATERIAL STORAGE	ARE MATERIALS STORED PROPERLY? YES <input type="checkbox"/> NO <input type="checkbox"/>			
	IF NO, WHAT ACTION IS TAKEN?			
SPECIFICATIONS	REVIEW EACH PARAGRAPH OF SPECIFICATIONS.			
	DISCUSS PROCEDURE FOR ACCOMPLISHING THE WORK.			
	CLARIFY ANY DIFFERENCES.			
PRELIMINARY WORK & PERMITS	ENSURE PRELIMINARY WORK IS CORRECT AND PERMITS ARE ON FILE.			
	IF NO, WHAT ACTION IS TAKEN?			

CH2M HILL SOUTH DIV RAC IV	PREPARATORY PHASE REPORT	REPORT NO:	DATE:	CTO NO:
PROJECT NO:	DEFINABLE FEATURE OF WORK:	SITE/ACTIVITY:		
TESTING	IDENTIFY TEST TO BE PERFORMED, FREQUENCY, AND BY WHOM.			
	TEST	FREQUENCY	PERFORMER	
	WHEN REQUIRED?			
	WHERE REQUIRED?			
	REVIEW TESTING PLAN.			
	HAVE TEST FACILITIES BEEN APPROVED?			
	TEST FACILITY	APPROVED?		
		YES <input type="checkbox"/> NO <input type="checkbox"/>		
		YES <input type="checkbox"/> NO <input type="checkbox"/>		
	SAFETY	ACTIVITY HAZARD ANALYSIS APPROVED? YES <input type="checkbox"/> NO <input type="checkbox"/>		
REVIEW APPLICABLE PORTION OF EM 385-1-1.				
MEETING COMMENTS	NAVY/ROICC COMMENTS DURING MEETING.			
OTHER ITEMS OR REMARKS	OTHER ITEMS OR REMARKS:			
PROJECT QC MANAGER NAME		PROJECT QC MANAGER'S SIGNATURE		DATE

Appendix D
Environmental Conditions Report Photo Log



Gas Hill after tank removal and site restoration facing south



Gas Hill after tank removal and site restoration facing southeast



Gas Hill after tank removal and site restoration facing northwest



Gas Hill after tank removal and site restoration facing northwest



Gas Hill after tank removal and site restoration facing northwest



Gas Hill after tank removal and site restoration facing west