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NSA MID SOUTH
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VOLUNTARY CORRECTIVE ACTION WORK PLAN FOR RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION FOR SOLID WASTE MANAGEMENT UNIT 17 FORMER S-9 UNDERGROUND WASTE TANK CONTAMINATED SOIL REMOVAL MILLINGTON SUPPACT TN

5/11/1999

NAVFAC SOUTHERN

VOLUNTARY CORRECTIVE ACTION WORK PLAN
RCRA FACILITY INVESTIGATION
NAVAL SUPPORT ACTIVITY MID-SOUTH
MILLINGTON, TENNESSEE

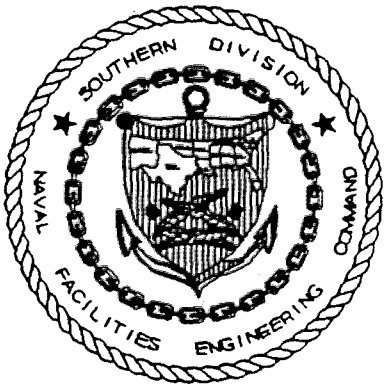
SWMU 17
FORMER S-9 UNDERGROUND WASTE TANK
CONTAMINATED SOIL REMOVAL

Revision: 1

CTO-106
Contract No. N62467-89-D-0318

Prepared for:

Department of the Navy
Southern Division
Naval Facilities Engineering Command
North Charleston, South Carolina



Prepared by:

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Memphis, Tennessee 38134
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The Contractor, EnSafe Inc., hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-89-D-0318 are complete, accurate, and complies with all requirements of the contract.

Date: May 11, 1999
Signature: _____
Name: Robert Smith
Title: Task Order Manager

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Acronyms and Abbreviations

BCT	BRAC Cleanup Team
bls	Below land surface
BRAC	Base Closure and Realignment Act of 1990
CHSP	Comprehensive Health and Safety Plan
cm/sec	Centimeters per second
CSI	Confirmatory Sampling Investigation
DI	Deionized
DOT	Department of Transportation
DPT	Direct push technology
DQO	Data Quality Objectives
DRO	Diesel Range Organics
DSW	Division of Solid Waste
DUST	Division of Underground Storage Tanks
E/A&H	EnSafe/Allen & Hoshall
ED	Environmental Division
GRO	Gasoline Range Organics
IDW	Investigation-derived waste
IR	Infrared
μg/L	Micrograms per liter
mg/kg	Milligrams per kilogram
NAS	Naval Air Station
NAVSUPPACT	Naval Support Activity
NSA	Naval Support Activity
OSWER	Office of Solid Waste and Environmental Restoration
PCB	Polychlorinated biphenyls
POTW	Publicly Owned Treatment Works
PPE	Personal Protective Equipment
PWD	Public Works Department
QA/QC	Quality assurance/quality control
RC	Reference concentration
RCRA	Resource Conservation and Recovery Act

RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
SSHSP	Site-Specific Health and Safety Plan
SSL	Soil Screening Level
SSO	Site Safety Officer
SVOC	Semivolatile Organic Compounds
SWMU	Solid Waste Management Unit
TCLP	Toxicity Characteristic Leaching Procedure
TDEC	Tennessee Department of Environment and Conservation
TPH	Total Petroleum Hydrocarbons
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VCA	Voluntary Corrective Action
VOC	Volatile Organic Compounds
yd^3	Cubic Yards

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1.0 INTRODUCTION

As part of the U.S. Navy Installation Restoration Program, the following Resource Conservation and Recovery Act (RCRA) Voluntary Corrective Action (VCA) Work Plan has been prepared for the removal of contaminated soil at solid waste management unit (SWMU) 17, a former underground tank in the Building S-9 complex, at Naval Support Activity (NAVSUPPACT or NSA) Mid-South, Millington, Tennessee (Figure 1). As a result of the closure of Naval Air Station (NAS) Memphis and its realignment as a Naval Support Activity, there have been several name changes at NSA Mid-South. Before October 1, 1995, the installation operated as NAS Memphis. From October 1, 1995 to October 1, 1998, the installation was known as NSA Memphis. On October 1, 1998, NSA Memphis was renamed to NSA Mid-South or NAVSUPPACT Mid-South. As part of the realignment, alphanumeric street names (e.g., 1st Avenue or E Street) were changed in 1998, and are referenced in parentheses following the first use of current street names. The primary references for this work plan are the *Comprehensive RCRA Facility Investigation [RFI] Work Plan* (E/A&H, 1994), the *RCRA Facility Assessment (RFA)* (ERC/EDGe, August 1990), and the *Assemblies G and H Site Investigation Plan — SWMUs 23, 24, 41, 43, 47, 17/48, and 19/49*, Revision 3 (EnSafe, 1997). All work performed will be in accordance with federal, state, and local regulations, and applicable guidance documents.

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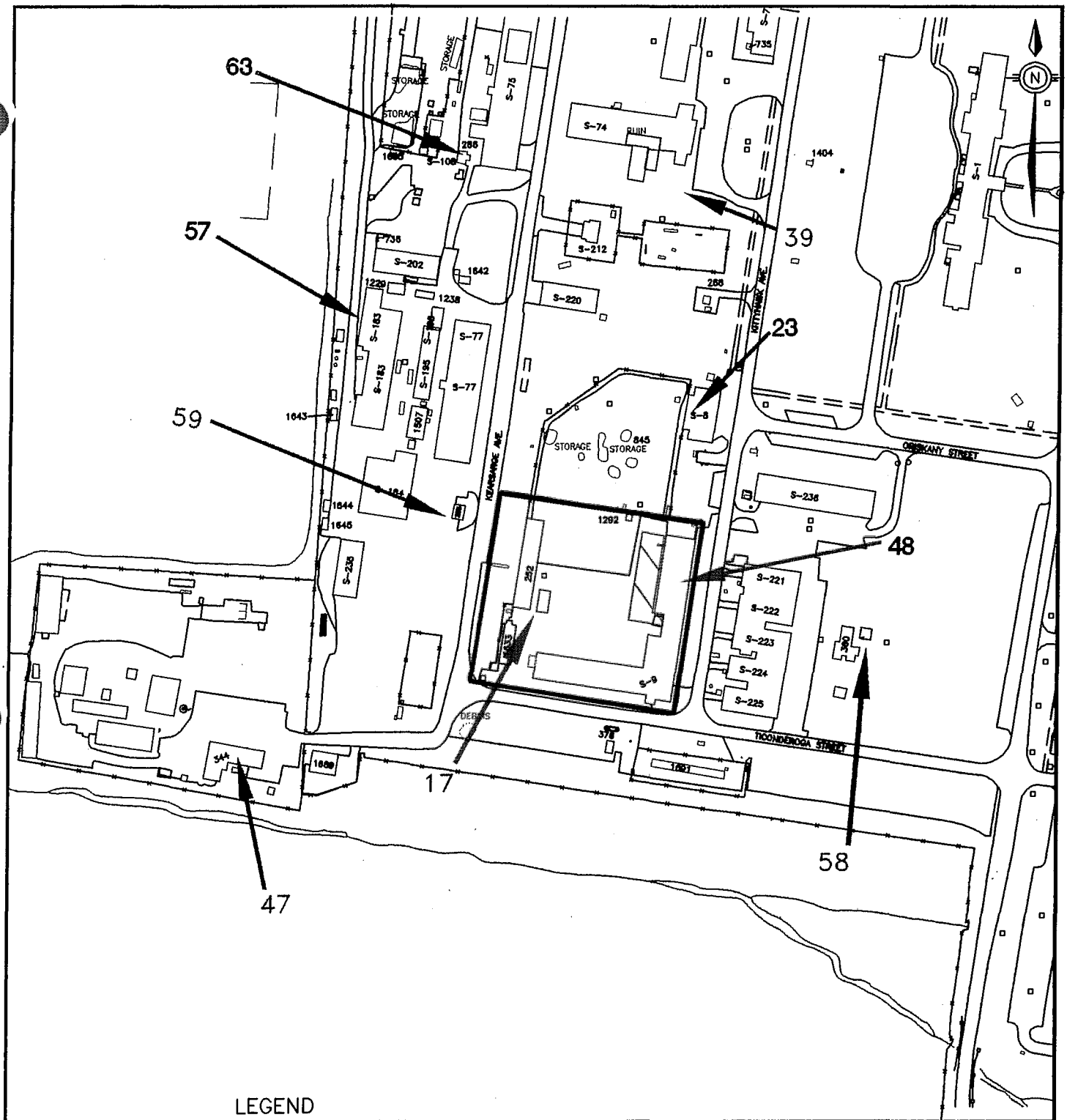

LEGEND

- SWMU 17 COMPOUND
- 23 – SWMU 23

250 0 250

SCALE FEET

SWMU 17
VCA WORK PLAN
NAVAL SUPPORT ACTIVITY
MID-SOUTH
MILLINGTON, TN.

FIGURE 1
VICINITY MAP
SWMU 17 VCA WORK PLAN

DWG DATE: 01/26/99 | DWG NAME: 0106B018

2.0 ENVIRONMENTAL SETTING

SWMU 17, designated as tank S-9, was installed in 1979 and still in use upon its removal in 1996. Tank S-9 was formerly located approximately 100 feet east of Kearsarge Avenue (formerly 1st Avenue) on the Southside of NSA Mid-South in the Building S-9 complex (Figure 1). No evidence of a release was visible at SWMU 17 during the RFA *Visual Site Inspection* (ERC/EDGe, 1990); however, data from the June 1996 VCA removal of the tank, which are presented in Section 4.4 of this work plan, indicate that a release had occurred before the tank was removed. In the RFA, tank S-9 was listed as underground storage tank (UST) 1657, but 1657 is a nearby oil/water separator.

2.1 Topography and Drainage

SWMU 17 and the surrounding area are characterized by relatively level, low-relief topography. The immediate area is covered by gravel or asphalt and slopes slightly south and west toward a north-south drainage ditch (SWMU 38) which flows south into Big Creek Drainage Canal.

2.2 Geologic and Hydrogeologic Information

The regional and local hydrogeology are described in Sections 2.11 and 2.12 of the *Comprehensive RFI Work Plan* (E/A&H, 1994). Updated information is available in *Hydrogeology of Post-Wilcox Group Stratigraphic Units in the Area of the Naval Air Station Memphis, Near Millington, Tennessee* (Kingsbury and Carmichael, 1995) and *Hydrogeology and Groundwater Quality at Naval Support Activity Memphis, Millington, Tennessee* (Carmichael et al., 1997).

2.2.1 Site-Specific Geology

Site-specific geologic data are not currently available for SWMU 17; however, lithologic information was obtained during the installation of background monitoring well cluster BG-04, approximately 750 feet northeast of SWMU 17, and background well 0BG11MA, approximately 900 feet southwest of the SWMU. Based on the lithologies encountered at BG-04, this area

consists of a complex shallow geology of low to very low-permeability silty clays and clays (loess) overlying a sand and gravel horizon (fluvial deposits). SWMU 17 is thought to be in a transitional zone where recent alluvial deposits associated with the Big Creek Drainage Canal area (300 feet to the south) grade laterally into older fluvial deposits. Table 1 lists stratigraphic units encountered in well cluster BG-04 and background well 0BG11MA (BG11).

Table 1
Stratigraphic Data

Stratigraphic Unit	BG-04	BG11
Alluvium	Not present	Loess or upper alluvium interval is 0-36 feet bls (36') and consists of clay, silty clay, clayey silt, and silt.
Loess	Silt and clayey silt, 0 - 38 feet bls (38')	Loess or upper alluvium interval is 0-36 feet bls (36') and consists of clay, silty clay, clayey silt, and silt.
Fluvial Deposits	Sand, gravel, and silt, 38 - 71 feet bls (33')	Sand and gravel, 37-69 feet bls (32').
Cockfield Formation	Sand and clay, 71 feet bls to termination of the boring at 76 feet bls.	Sand, silt, and clay, 67 feet bls to termination of the boring at 76 feet bls.

Notes:
bls = below land surface
(38') = thickness of stratigraphic unit

2.2.2 Site-Specific Hydrogeology

Three wells were installed at location BG-04 on the Southside of NSA Mid-South in January 1995 for the RFIs of Assembly A SWMUs. The wells were completed in the loess (BG04L), upper part of the fluvial deposits (BG04UF), and lower part of the fluvial deposits (BG04LF). Data collected from these wells indicate that groundwater is typically first encountered at the interface between the silt and clayey silt units in the loess. Groundwater measurements made on March 30, 1995, indicate static groundwater levels in the wells are approximately 5 feet bls in the loess, and 10 to 11 feet bls in the upper and lower parts of the fluvial deposits. Based on the topography and

information in Carmichael et al., (1997), groundwater in the fluvial deposits in the SWMU 17 area flows southwesterly towards Big Creek Drainage Canal. In interstream areas within the Southside of NSA Mid-South, groundwater in the loess most likely moves primarily downward to recharge the deeper fluvial deposits, whereas in near-stream areas where alluvium is present, groundwater locally moves downward, then laterally to discharge to the streams. In the immediate vicinity of SWMU 17, water in the loess/upper part of the alluvium likely move laterally to the south and discharge to the SWMU 38 drainage ditch.

2.3 Climatological Data

Regional climatological data are provided in Section 2.8 of the *Comprehensive RFI Work Plan* (E/A&H, 1994).

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3.0 SOURCE CHARACTERIZATION

SWMU 17 is reported to have received used automotive oil and used hydraulic fluid generated during automobile maintenance at Building S-9. Tank S-9 was installed in 1979 and was in use until 1996; however, the date when the tank was initially used for storing used oil is not known. The tank S-9 closure report is included as Appendix B. Tables 2 through 4 present inorganic, organic, and TPH data collected during the tank removal that indicate a release occurred before it was removed. Screening sample locations are shown in Figure 2.

Table 2
Confirmation Soil Sample Detections From Bottom of Tank Pit
Inorganic Analytical Results from Tank S-9 Removal — SWMU 17

Sample ID	Analyte	Result	Units
017S000101	Antimony	9 J	mg/kg
	Arsenic	2.5 J	mg/kg
	Barium	108	mg/kg
	Beryllium	0.45 J	mg/kg
	Cadmium	2.8	mg/kg
	Chromium	10.9 J	mg/kg
	Cobalt	8 J	mg/kg
	Copper	19.5	mg/kg
	Lead	14.4 J	mg/kg
	Nickel	18.8	mg/kg
	Tin	25.4 J	mg/kg
	Vanadium	21.6	mg/kg
	Zinc	55.7	mg/kg

Notes:
J = Compound was detected at a concentration less than the method reporting limit; value was estimated.
mg/kg = Milligrams per kilogram
mg/L = Milligrams per liter

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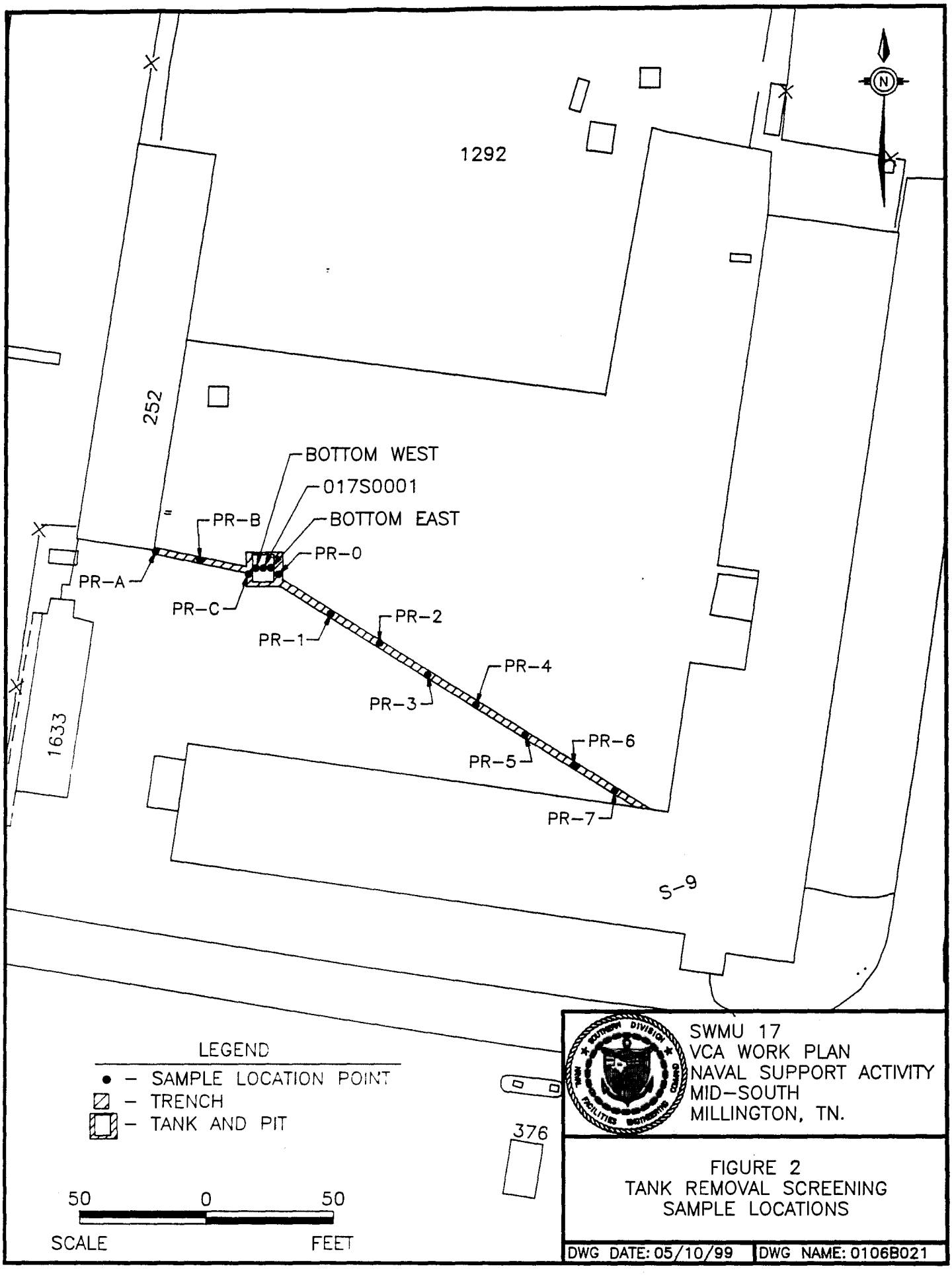

SWMU 17
VCA WORK PLAN
NAVAL SUPPORT ACTIVITY
MID-SOUTH
MILLINGTON, TN.

FIGURE 2
TANK REMOVAL SCREENING
SAMPLE LOCATIONS

DWG DATE: 05/10/99 | DWG NAME: 0106B021

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Table 3
Confirmation Soil Sample Detections From Bottom of Tank Pit
Organic Analytical Results from Tank S-9 Removal — SWMU 17 (μg/kg)

Sample ID	Analyte	Result
017S000101	2 methylnaphthalene	15,000
	4,4'-DDD	3.8 J
	4,4'-DDE	4.8 J
	4,4'-DDT	2.4 J
	Endosulfan II	4.4 J
	Endrin	5.6
	Endrin aldehyde	2.3 J
	Ethylbenzene	370
	Heptachlor epoxide	2.3 J
	Naphthalene	8,700 J
	Phenanthrene	1,100 J
	Styrene	31 J
	Tetrachloroethene	17 J
	Toluene	140
	Xylene	1,400
	alpha-Chlordane	2.6 J

Notes:
J = Compound was detected at a concentration less than the method reporting limit; value was estimated.
μg/kg = Micrograms per kilogram.

Table 4
Confirmation Soil Sample Detections from Bottom of Tank Pit
Total Petroleum Hydrocarbon Analytical Results from Tank S-9 Removal — SWMU 17 (mg/kg)

Sample ID	Result
S-9 Bottom East	2,380
S-9 Bottom West	6,820
Pipe Run (PR)-A	5,140
PR-B	1,010
PR-C	3,390
PR-0	2,240
PR-1	3,620
PR-2	860
PR-3	560
PR-4	1,320
PR-5	1,620
PR-6	92
PR-7	3,000

Notes:
mg/kg = Milligrams per kilogram
PR = Pipe run

TPH concentrations in confirmation soil samples from the tank S-9 removal were compared to the most conservative Tennessee Department of Environment and Conservation (TDEC) cleanup level for TPH in soil of 100 milligrams per kilogram (mg/kg). This comparison indicates that both samples from the tank pit (S-9 Bottom East [2,380 mg/kg], S-9 Bottom West [6,820 mg/kg]) and 10 of the 11 samples from the piping trench (Pipe Run [PR]-A [5,140 mg/kg], PR-B [1,010 mg/kg], PR-C [3,390 mg/kg], PR-0 [2,240 mg/kg], PR-1 [3,620 mg/kg], PR-2 [860 mg/kg], PR-3 [560 mg/kg], PR-4 [1,320 mg/kg], PR-5 [1,620 mg/kg], and PR-7 [3,000 mg/kg]) exceed TDEC's most conservative cleanup level.

Because a release from SWMU 17 had been previously identified (*VCA Report: SWMUs 3, 7, 17, 18, 19, 67 and the Gasoline Pits* [EnSafe, February 20, 1998]), the scope of the investigation was expanded to meet RFI requirements. The entire Confirmatory Sampling Investigation (CSI)/RFI investigation at SWMU 17 will be documented in the Assembly F RFI Report.

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4.0 CHARACTERIZATION OF HAZARDOUS CONSTITUENT RELEASES

4.1 Previous Investigations

The data collected during the tank S-9 removal in June 1996 indicated a release occurred before the tank was removed. Staining was visible around the fill pipe and in subsurface soil above and below the tank. In January 1998, subsurface soil and groundwater at SWMU 17 were sampled as part of the Assemblies G and H CSI, although SWMU 17 is part of Assembly F. A follow-up investigation was conducted at SWMU 17 in June 1998 to examine the extent of TPH contamination. No other investigations or reports concerning SWMU 17 are known to exist or to be available. Table 5 shows the sections of this report in which previous investigations are discussed.

Table 5
SWMU 17 Previous Investigations

Investigation	Date	Section Discussed
Tank Removal	June 1996	3.0
Assembly F RFI	January 1998	4.2
Follow-up Direct Push Technology (DPT) Investigation	June 1998	4.4

4.2 SWMU 17 (Assembly F RFI Data)

Inorganic constituents identified in soil at SWMU 17 during the January 1998 investigation were compared to soil background reference concentrations (RCs) and soil screening levels (SSLs), while organic compounds detected were compared to SSLs. Surface soil and groundwater samples from the background monitoring wells installed throughout NSA Mid-South in two phases (Assembly A - 1995 and Assembly E - 1996) were analyzed for Appendix IX metals. The procedures used to determine the background RCs in soil and groundwater are documented in the Technical Memorandum — *Reference Concentrations* (E/A&H, 1996).

4.2.1 Objective of the Field Investigation

The objective of the January 1998 field investigation was to better define the extent of contamination identified at SWMU 17 during the tank closure. All samples were collected and processed per Section 4 of the *Comprehensive RFI Work Plan* (E/A&H, 1994).

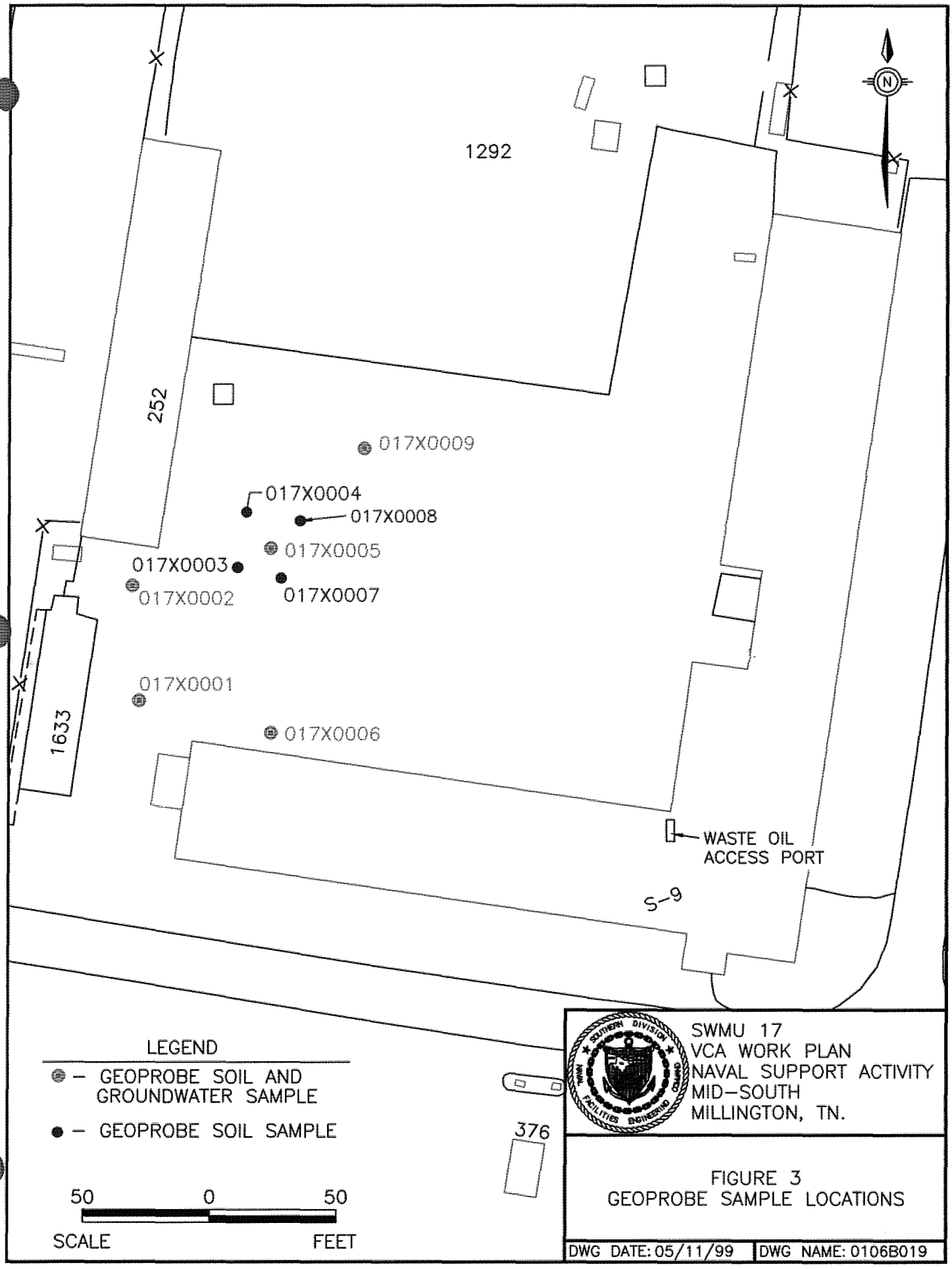
4.2.2 Sampling

Soil

The January 1998 soil investigation consisted of Geoprobe direct push technology (DPT) sampling (as outlined in Section 4.4.4.3 of the *Comprehensive RFI Work Plan* [E/A&H, 1994]) for offsite laboratory analysis. One soil sample each was collected from four locations at SWMU 17 (Figure 3) using a Geoprobe. The samples were collected 5 feet from each corner of the tank pit in the 12 to 15-foot interval (soil-groundwater interface). SWMU 17 soil samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), chlorinated pesticides/polychlorinated biphenyls (PCBs), TPH, and Appendix IX metals.

Groundwater

The January 1998 groundwater investigation focused on the fluvial deposits (or deep alluvium) underlying the loess (or shallow alluvium) at SWMU 17 because it is the preferential zone of groundwater flow and the primary route for contaminant transport, particularly for chlorinated solvents, at NSA Mid-South. The groundwater investigation consisted of Geoprobe sampling and offsite laboratory analysis. Groundwater or soil samples were collected from five Geoprobe locations (Figure 3), as dictated by field conditions, at the 12 to 15-foot interval (saturated soil at the soil-groundwater interface) and at a depth of approximately 50 feet in the fluvial deposits groundwater. All samples were analyzed at an offsite laboratory.


1292
252
1633
017X0009
017X0004
017X0008
017X0005
017X0003
017X0002
017X0007
017X0001
017X0006
WASTE OIL
ACCESS PORT
S-9
376
N
LEGEND
– GEOPROBE SOIL AND GROUNDWATER SAMPLE
– GEOPROBE SOIL SAMPLE
50 0 50
SCALE FEET
SWMU 17
VCA WORK PLAN
NAVAL SUPPORT ACTIVITY
MID-SOUTH
MILLINGTON, TN.
FIGURE 3
GEOPROBE SAMPLE LOCATIONS
DWG DATE: 05/11/99
DWG NAME: 0106B019

4.2.3 Analytical Procedures and Requirements

Soil and groundwater samples were submitted to an offsite laboratory and analyzed using the following methods:

- VOCs, U.S. Environmental Protection Agency (USEPA) Method 8240
- SVOCs, USEPA Method 8270
- TPH, USEPA Method 418.1
- TPH-Gasoline Range Organics (GRO), TN Modified Method 8015/GRO
- TPH-Diesel Range Organics (DRO), TN Modified Method 8015/DRO
- Chlorinated pesticides/PCBs, USEPA Method 8080
- RCRA Part 264, Appendix IX Total Metals, USEPA Method 6010/7000 series

Table 6 lists the number of samples collected and the analyses performed.

Table 6
Sampling and Analytical Requirements — SWMU 17

Method	Sample Matrix/Interval	Number of Samples	Analysis
Geoprobe	Soil (12-15')	4	VOCs, SVOCs, chlorinated pesticides/ PCBs, TPH, and Appendix IX metals
Geoprobe	Groundwater — loess (saturated soil 12-15')	5	VOCs
	Groundwater — fluvial deposits (approximately 50')	5	VOCs

4.2.4 Potential Receptors

Millington Heights was formerly the closest residential area to SWMU 17, but it has since been demolished. Presently the closest residential area to SWMU 17 is military housing within NSA Mid-South, which is approximately 4,500 feet east of SWMU 17. The Building S-9 area is currently occupied by a Navy contractor.

Storm water runoff from SWMU 17 discharges into SWMU 38, then into Big Creek Drainage Canal, which may serve as a food and water source for wildlife. SWMU 38 comprises drainage ways in populated areas of NSA Mid-South; therefore, infrequent contact with surface water and sediment by NSA Mid-South personnel is possible. However, based on the SWMU 38 RFI, no further action has been recommended for SWMU 38 (EnSafe, February 2, 1998). Offsite, contact with surface water and sediment by the general public is possible due to unrestricted access to the drainage way.

Five production wells at NSA Mid-South supply drinking water. The nearest production wells to SWMU 17 are PW-4 and PW-5. PW-4 is approximately 2,800 feet north of SWMU 17 and PW-5 is approximately 1,400 feet north. Both production wells are screened in the Fort Pillow aquifer (PW-4 is screened at 1,450 feet bls and PW-5 is screened at 1,435 feet bls) with the Flour Island confining unit separating the overlying Memphis sand aquifer from the Fort Pillow aquifer.

4.3 SWMU 17 Results

VOCs, SVOCs, and inorganics were identified during the RFI in subsurface soil at SWMU 17. Inorganic constituents identified in soil at SWMU 17 were compared to background soil concentrations to determine whether measured values occur naturally or indicate contamination. The procedures used to determine the background RCs for inorganics are documented in the technical memorandum — *Reference Concentrations* (E/A&H, 1996).

Tables 7 through 9 summarize the analytical data collected during the RFI and present SSL and background RCs for comparison. Table 9 presents TPH data for which there are no SSL values or background RCs. For SWMU 17 data, the tables present concentrations that exceed detection limits only. A complete copy of the laboratory data is in Appendix C.

Table 7
SWMU 17 Detections in Soil by Location (µg/kg)

Location	Contaminant	SSL	Result
017S000215	Acetone	800	15 J
	Benzene	**2**	**3.3 J**
017S000315	Acetone	800	38 J
	Benzene	**2**	**2.3 J**
	Diethylphthalate	23,000	54 J
	Tetrachloroethene	3	1.6 J
	Xylene (Total)	9,000	2 J
	bis(2-Ethylhexyl)phthalate (BEHP)	180,000	100 J
017S000415	Acetone	800	26 J
017S000515	bis(2-Ethylhexyl)phthalate (BEHP)	180,000	160 J
017S000715	Acetone	800	22 J
	Diethylphthalate	23,000	54 J
017S000815	Acetone	800	50 J
	Benzene	**2**	**2.5 J**

Notes:
J = Compound was detected at a concentration less than the method reporting limit; value was estimated.
µg/kg = Micrograms per kilogram
SSL = Soil screening level from the May 1996 Generic Screening Levels (USEPA, May 1996)
Bold indicates contaminants that exceed their SSL.

Table 8
SWMU 17 Inorganic Detections in Subsurface Soil by Location (mg/kg)

Location	Constituent	RC	SSL	Result
017S000115	**Arsenic (As)**	20.3	1	8.1
	Barium (Ba)	265	82	101
	Beryllium (Be)	1.00	3	0.45 J
	Cadmium (Cd)	3.24	0.4	0.09 J
	Chromium (Cr)	28.3	2	13.5 J
	Cobalt (Co)	14.4	DNE	7.1
	Copper (Cu)	32.5	DNE	17.3 J
	Lead (Pb)	19.8	DNE	9.5 J
	Mercury (Hg)	0.18	DNE	0.03
	Nickel (Ni)	DNE	7	17.6
	Vanadium (V)	43.7	300	23.6
	Zinc (Zn)	109	620	51.3 J
017S000215	**Arsenic (As)**	20.3	1	4.7
	Barium (Ba)	265	82	60.5
	Chromium (Cr)	28.3	2	10.9 J
	Cobalt (Co)	14.4	DNE	6
	Copper (Cu)	32.5	DNE	12.9
	Lead (Pb)	19.8	DNE	7.3 J
	Mercury (Hg)	0.18	DNE	0.02 J
	Nickel (Ni)	DNE	7	13.9 J
	Vanadium (V)	43.7	300	15.6
	Zinc (Zn)	109	620	35.6 J
017S000315	**Arsenic (As)**	20.3	1	2.6
	Barium (Ba)	265	82	48.9
	Chromium (Cr)	28.3	2	10.3 J
	Cobalt (Co)	14.4	DNE	6.5
	Copper (Cu)	32.5	DNE	13.8
	Lead (Pb)	19.8	DNE	7.5 J
	Mercury (Hg)	0.18	DNE	0.02 J
	Nickel (Ni)	DNE	7	14.5 J
	Vanadium (V)	43.7	300	17.3
	Zinc (Zn)	109	620	36.4 J

Table 8
SWMU 17 Inorganic Detections in Subsurface Soil by Location (mg/kg)

Location	Constituent	RC	SSL	Result
017S000415	**Arsenic (As)**	20.3	1	7.2
	Barium (Ba)	265	82	60.7
	Chromium (Cr)	28.3	2	**11.3 J**
	Cobalt (Co)	14.4	DNE	5.6
	Copper (Cu)	32.5	DNE	12.5
	Lead (Pb)	19.8	DNE	9 J
	Mercury (Hg)	0.18	DNE	0.02 J
	Nickel (Ni)	DNE	7	**13.2**
	Vanadium (V)	43.7	300	17.9
	Zinc (Zn)	109	620	41.5 J
017S000515	**Arsenic (As)**	20.3	1	**2.4 J**
	Barium (Ba)	265	82	48.5
	Beryllium (Be)	1.00	3	0.39 J
	Cadmium (Cd)	3.24	0.4	0.06 J
	Chromium (Cr)	28.3	2	**11.8 J**
	Cobalt (Co)	14.4	DNE	6.1
	Copper (Cu)	32.5	DNE	14.8 J
	Lead (Pb)	19.8	DNE	7.9 J
	Mercury (Hg)	0.18	DNE	0.02
	Nickel (Ni)	DNE	7	14.7
	Vanadium (V)	43.7	300	18.5
	Zinc (Zn)	109	620	48.3 J
017S000615	**Arsenic (As)**	20.3	1	**9.5**
	Barium (Ba)	265	82	79.4
	Beryllium (Be)	1.00	3	0.4 J
	Chromium (Cr)	28.3	2	**13 J**
	Cobalt (Co)	14.4	DNE	6.9
	Copper (Cu)	32.5	DNE	16.4 J
	Lead (Pb)	19.8	DNE	8.4 J
	Mercury (Hg)	0.18	DNE	0.02
	Nickel (Ni)	DNE	7	**18.6**
	Vanadium (V)	43.7	300	22.1
	Zinc (Zn)	109	620	46.7 J

Table 8
SWMU 17 Inorganic Detections in Subsurface Soil by Location (mg/kg)

Location	Constituent	RC	SSL	Result
017S000715	**Antimony (Sb)**	DNE	0.3	**0.58 J**
	Arsenic (As)	20.3	1	4.2
	Barium (Ba)	265	82	61.9
	Chromium (Cr)	28.3	2	**11.8 J**
	Cobalt (Co)	14.4	DNE	5.5
	Copper (Cu)	32.5	DNE	13.7
	Lead (Pb)	19.8	DNE	8.1 J
	Mercury (Hg)	0.18	DNE	0.01 J
	Nickel (Ni)	DNE	7	**13.9 J**
	Vanadium (V)	43.7	300	17.4
	Zinc (Zn)	109	620	39.9 J
017S000815	**Antimony (Sb)**	DNE	**0.3**	**0.51 J**
	Arsenic (As)	20.3	**1**	**3.3**
	Barium (Ba)	265	82	57.5
	Chromium (Cr)	28.3	**2**	**13 J**
	Cobalt (Co)	14.4	DNE	6.3
	Copper (Cu)	32.5	DNE	16.5
	Lead (Pb)	19.8	DNE	8.8 J
	Mercury (Hg)	0.18	DNE	0.02 J
	Nickel (Ni)	DNE	7	**16.3 J**
	Vanadium (V)	43.7	300	19.9
	Zinc (Zn)	109	620	43.7 J
017S000915	**Arsenic (As)**	20.3	1	**4 J**
	Barium (Ba)	265	82	**92.1**
	Beryllium (Be)	1.00	3	**0.54 J**
	Cadmium (Cd)	3.24	0.4	**0.21 J**
	Chromium (Cr)	28.3	2	**16.3 J**
	Cobalt (Co)	14.4	DNE	3.3
	Copper (Cu)	32.5	DNE	**14.8 J**
	Lead (Pb)	19.8	DNE	**8.1 J**
	Mercury (Hg)	0.18	DNE	**0.04**
	Nickel (Ni)	DNE	7	**16**
	Vanadium (V)	43.7	300	17.9
	Zinc (Zn)	109	620	**64.1 J**

Notes:
DNE = Does not exist
J = Compound was detected at a concentration less than the method reporting limit; value was estimated.
mg/kg = Milligrams per kilogram
RC = Background reference concentration from the August 1996 Technical Memorandum — Reference Concentrations (E/A&H, 1996)
SSL = Soil screening level from the May 1996 Generic Screening Levels (USEPA. May 1996)
Bold indicates constituents that exceed at least one standard reference value.

Table 9
SWMU 17 TPH Detections in Subsurface Soil by Location (mg/kg)

Sample Number	Result
017S000115	160 J
017S000215	120 J
017S000315	130 J
017S000415	66 J
017S000715	320 J
017S000815	160 J

Notes:
J = Compound was detected at a concentration less than the method reporting limit; value was estimated.
mg/kg = Milligrams per kilogram

4.4 Follow-up DPT Investigation

In June 1998, additional sampling was conducted at SWMU 17 to define the extent of TPH contamination. A total of 39 samples from 18 locations (Figure 4) were field screened for TPH with an Infrared (IR) TPH analyzer. Table 10 provides the TPH concentrations from these samples.

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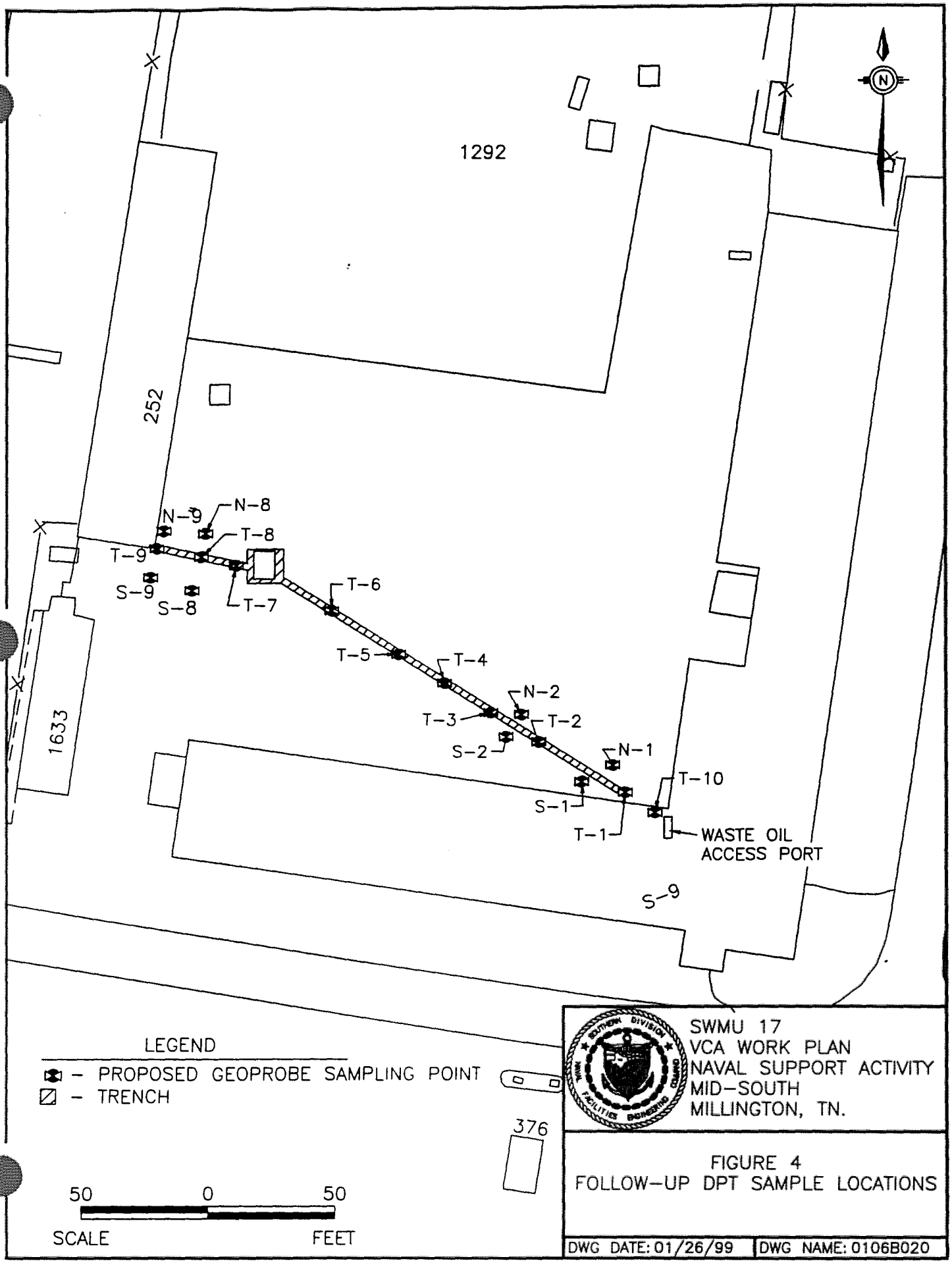
1292
252
1633
376
N-9
N-8
T-8
T-9
S-9
S-8
T-7
T-6
T-5
T-4
N-2
T-3
T-2
S-2
N-1
T-10
S-1
T-1
WASTE OIL
ACCESS PORT
S-9
N
LEGEND
– PROPOSED GEOPROBE SAMPLING POINT
– TRENCH
50 0 50
SCALE FEET
SWMU 17
VCA WORK PLAN
NAVAL SUPPORT ACTIVITY
MID-SOUTH
MILLINGTON, TN.
FIGURE 4
FOLLOW-UP DPT SAMPLE LOCATIONS
DWG DATE: 01/26/99
DWG NAME: 0106B020

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Table 10
SWMU 17 — TPH Concentrations in Soil (mg/kg)

Sample ID	Depth Interval (feet bls)	TPH Concentration
017SN00102	1-2	18
017SN00103	2-3	158
017SN00104	3-4	6
017ST00103	2-3	3
017ST00104	3-4	6
017SS00103	2-3	5
017SS00104	3-4	9
017SN00203	2-3	3
017SN00204	3-4	0
017ST00203	2-3	18
017ST00204	3-4	4
017SS00202	1-2	15
017SS00203	2-3	37
017SS00204	3-4	10
017ST00303	2-3	5
017ST00304	3-4	0
017ST00403	2-3	7
017ST00404	3-4	3
017ST00503	2-3	0
017ST00504	3-4	1
017ST00604	3-4	10
017ST00704	3-4	5
017SN00803	2-3	77
017SN00804	3-4	72
017ST00802	1-2	452
017ST00803	2-3	7
017ST00804	3-4	5
017SS00803	2-3	64
017SS00804	3-4	64

Table 10
SWMU 17 — TPH Concentrations in Soil (mg/kg)

Sample ID	Depth Interval (feet bls)	TPH Concentration
017SN00903	2-3	138
017SN00904	3-4	63
017ST00903	2-3	0
017ST00904	3-4	344
017ST00905	4-5	7
017ST00907	6-7	12
017ST00908	7-8	1
017SS00904	3-4	2
017ST01003	2-3	58
017ST01004	3-4	63

4.5 Regulatory Action Levels

The TDEC, Division of Underground Storage Tanks (DUST) established uniform soil cleanup standards for petroleum releases that *apply to both regulated and non-regulated UST sites, as well as non-tank-related sites* (Tennessee Senate Bill 2720 [Public Chapter 864], May 3, 1996). These regulations, presented in the TDEC, DUST, *Environmental Assessment Guidelines* (TDEC, 1996), establish cleanup levels for TPH in soil based on soil permeability and groundwater classification.

TDEC's criteria for determining a site-specific TPH cleanup level are outlined in Table 11.

Table 11
TDEC, Division of USTs
TPH Cleanup Levels (mg/kg)

Soil Permeability	$>10^{-4}$ cm/sec	10^{-4} to 10^{-6} cm/sec	$<10^{-6}$ cm/sec
Drinking Water	100	250	500
Non-Drinking Water	250	500	1,000

Data collected at SWMU 17 indicate a permeability in the loess soil averaging 3.6 x 10^{-6} cm/sec from the 10- to 12-foot depth. In the event that sand stringers or any significant lithology changes in the loess are identified, the cleanup level will be adjusted accordingly.

Groundwater is classified as a drinking water or a non-drinking water supply based partly on whether it exceeds USEPA drinking water standards. Based on samples collected from the loess at background wells throughout NSA Mid-South, groundwater in this unit exceeds certain national primary and secondary drinking water standards (*Drinking Water Regulations and Health Advisories*, USEPA, October 1996), as indicated in Table 12. Exceedances of either primary or secondary standards for loess groundwater probably result from relatively large amounts of suspended solids in the samples and analyses of total (non-filtered) water samples.

Table 12
Background Loess Groundwater Data vs. USEPA Drinking Water Standards
(μg/L)

Sample ID	Date	Parameter	Result	USEPA Drinking Water Standard	Standard
0BGG01LS01	21-Mar-95	Antimony	20	6	Primary
0BGG01LS02	10-Nov-95	Antimony	25	6	Primary
		Thallium	3	2	Primary
0BGG02LS01	17-Mar-95	Antimony	20	6	Primary
		Chromium	167	100	Primary
		Lead	33.6	15	Primary
		Nickel	143	100	Primary
0BGG02LS02	9-Nov-95	Antimony	25	6	Primary
		Thallium	3	2	Primary
0BGG04LS01	16-Mar-95	Antimony	20	6	Primary
		Chromium	213	100	Primary
		Nickel	165	100	Primary
0BGG04LS02	9-Nov-95	Antimony	25	6	Primary
		Cadmium	5.4	5	Primary
		Chromium	222	100	Primary
		Nickel	157	100	Primary
		Thallium	3	2	Primary

Table 12
Background Loess Groundwater Data vs. USEPA Drinking Water Standards
(μg/L)

Sample ID	Date	Parameter	Result	USEPA Drinking Water Standard	Standard
0BGG05LS01	17-Mar-95	Antimony	40.3	6	Primary
		Chromium	160	100	Primary
		Nickel	114	100	Primary
0BGG05LS02	9-Nov-95	Antimony	25	6	Primary
		Thallium	3	2	Primary

Based on the soil permeability at SWMU 17 and the groundwater being a non-drinking water supply, the site specific TPH cleanup level for SWMU 17 would be 500 mg/kg. However, the NSA Mid-South, PWD - ED wants soil from the surface to a depth of 5 feet to have a TPH cleanup level of 100 mg/kg or below, due to potential utility excavation in the future.

onsite will be required to sign a form acknowledging that they are familiar with the plan and agree to abide by its guidelines. The SSHASP contains a copy of the compliance agreement form.

5.2 Removal Activities

Several activities will be conducted before and during soil removal. Specific tasks include soil excavation and screening. TDEC will be given at least two weeks notice by the NSA Mid-South, PWD — ED before any removal activities start. If previously unknown utilities are encountered or any utility lines broken during the soil removal, the PWD — ED will be notified immediately.

Surface and Subsurface Soil Excavation

Soil excavation will start with removal of asphalt and pea-gravel fill material down to the previous depth of the trench and the tank pit bottom. Pea-gravel in contact with soil will be stockpiled with the soil piles. All pea-gravel that is not in contact with contaminated soil will be stockpiled separately and will either be reused or disposed of as construction debris. The removed asphalt will be disposed of as construction debris. The original tank excavation was 16'x15'x10' and will be excavated to these dimensions before contaminated soil removal begins. Removal of 1-foot thick (maximum) lifts within the former tank pit and along the former trench will continue until field screening indicates that soil remaining on the sides and bottom of the excavation has TPH concentrations that are less than the action level of either 100 mg/kg in the upper 5 feet or 500 mg/kg below 5 feet.

The contractor is expected to excavate with a backhoe or trackhoe. Also, the contractor is expected to assess any nearby storm water inlets and use appropriate measures to control storm water flow, if necessary, during excavation activities. As the pea-gravel and soil are excavated, they will be segregated and stockpiled onsite into a soil-free pea-gravel pile and a potentially contaminated soil and pea-gravel pile. The soil pile will be sampled by EnSafe for confirmation and disposal characterization. The stockpiled soil will be placed on plastic and covered with

plastic to prevent cross-contamination and erosion. The contractor will be responsible for maintaining the plastic cover on the stockpiled soil. Five-day turnaround will be requested for the disposal profile samples. Upon receipt of the results, EnSafe will attach a summary of detections to the data package, and forward two copies to the NSA Mid-South, PWD — ED within five days of receipt of the data. Contaminated soil will be properly disposed of in accordance with current USEPA and TDEC regulations. Any special waste soil will be disposed of by the contractor, while any hazardous waste soil will be disposed of by the NSA Mid-South, PWD — ED.

Soil Screening

EnSafe personnel will collect soil samples from the excavation walls and base as each 1-foot lift is removed from the full length of the trench using disposable spoons or decontaminated stainless-steel spoons. These samples will be collected from the backhoe bucket, if necessary. Soil samples will be collected from the center of the bucket to avoid sample contamination from the bucket wall. Personnel will not enter the excavation if it is deeper than 4 feet. The samples will be collected in accordance with the procedures described in Section 4.4.3 of the *Comprehensive RFI Work Plan* (E/A&H, 1994).

Samples will be screened using an IR TPH Plus Field Analyzer, which performs analyses based on USEPA Method 418.1 (IR method). The excavation will continue until field screening demonstrates that the contaminated soil has been removed to TPH concentrations less than the site specific remediation level of 100 mg/kg in the upper 5 feet or 500 mg/kg below 5 feet.

5.3 Postremoval Activities

Several activities will be conducted after soil is removed, including confirmation soil sampling, backfilling the excavation, and disposing of used personal protective equipment (PPE) and disposable sampling equipment.

Confirmation Soil Sampling

When field screening demonstrates that the contaminated soil has been removed to TPH concentrations less than the site specific remediation level of 100 mg/kg in the upper 5 feet or 500 mg/kg below 5 feet, EnSafe will collect a 5-part composite sample from each of the excavation walls of the former tank pit, four grab samples from the former tank pit floor (one from each corner), and composite samples from every 10 feet of the trench bottom. If the trench is deeper than four feet, composite samples will be taken from every 10 feet of the trench wall in addition to those taken from the trench bottom. These confirmation soil samples will be analyzed onsite using the TPH Plus Field Analyzer for TPH (Method 418.1) and at an offsite laboratory for Appendix IX metals (USEPA Method 6010/7000 series).

In the event that water is encountered in the excavation, the contractor will containerize it in properly labeled U.S. Department of Transportation (DOT)-approved 55-gallon drums. EnSafe will collect water samples for analyses of VOCs, and oil and grease. The drums will be placed in a secured location approved by the NSA Mid-South, PWD — ED and remain at this location. The contractor will discharge the water to the sewer via an oil-water separator designated by the NSA Mid-South, PWD — ED after contacting the PWD for permission and specifications from the City of Millington POTW (publicly owned treatment works). If any water is not approved for discharge to the sewer, the NSA Mid-South, PWD — ED will arrange for its proper disposal. EnSafe will be responsible for collecting any water samples required by the disposal facility and obtaining any additional analyses to determine the appropriate means of disposal. It is not anticipated that groundwater will be intersected.

Backfill of the Excavation

The excavation will remain open until confirmation samples document that TPH concentrations in soil are below the action level of 100 mg/kg in the upper 5 feet or 500 mg/kg below 5 feet and the BRAC Cleanup Team (BCT) has approved backfilling based on a review of the TPH and

metals concentrations. Temporary caution markers will be placed around the excavation. Number 33C limestone will be used by the contractor for backfill. The area will then be re-surfaced with asphalt by the contractor. Care will be taken to repair the concrete island, should it be necessary to remove a section of it during excavation.

Removal of Construction Materials

After stockpiled soil has been removed, any debris or trash associated with field activities will be removed by the contractor. The area will be left as close as possible to its pre-excavation condition.

Disposal of PPE and Disposable Sampling Equipment

Used PPE and disposable sampling equipment such as plastic sheeting will be profiled for disposal, along with the excavated soil. Any used PPE or disposable sampling equipment will be stockpiled, along with the excavated soil for loading and disposal, after the disposal profile is approved. Contractor personnel will be responsible for the proper disposal of all PPE and disposable equipment. Section 5.9, Investigation-Derived Waste, has additional information on waste disposal.

The Voluntary Corrective Action Report

EnSafe will prepare a report after field activities are complete and analytical results have been received to address the following:

- Field activities, including a description of the field screening and sampling activities.
- Analytical test results for confirmation samples collected following the soil removal.

- A diagram showing the features of the site during the removal action. The diagram will show where the excavation is located, soil sample locations, and detected concentrations.

- Disposal manifests (if available at the time of report) and a description of the fate of water generated during the removal action, if any.

The contractor will submit a report describing its activities during the soil removal.

5.4 Analytical Requirements

Analytical requirements for the samples scheduled to be collected at SWMU 17 are summarized in Table 13. Confirmation samples will be analyzed for TPH (418.1; field IR) and Appendix IX metals (USEPA Method 6010/7000 series; offsite laboratory, 48-hour turnaround). One characterization sample for soil disposal, which will be collected using a decontaminated stainless-steel hand auger or spoon and bowl for every 100 yd^3 or less of soil, will be analyzed for toxicity characteristic leaching procedure (TCLP) lead and TCLP benzene. EnSafe will collect any additional samples required by the disposal facility and submit them for the required analyses.

Table 13
Sample Summary and Analytical Requirements

Sample Type	Matrix	Analytical Parameters	Turnaround Time	Laboratory
Extent Verification	Soil	TPH based on USEPA Method 418.1	Field Analysis	Onsite
Confirmation	Soil	TPH Method 418.1 Appendix IX Metals	Field Analysis 48 hours	Onsite Offsite
Soil Disposal	Soil (Excavated Material)	TCLP lead TCLP benzene	5 days	Offsite

Field measurements at SWMU 17 will be collected in accordance with Section 4.10.1 of the *Comprehensive RFI Work Plan* (E/A&H, 1994). IR method screening of soil samples will be performed in accordance with the manufacturer's instructions.

5.5 Sample Management

Samples will be managed in accordance with Sections 4.12 and 5 of the *Comprehensive RFI Work Plan* (E/A&H, 1994).

5.6 Sample Custody

Sample custody will be maintained in accordance with Section 4.12.5 of the *Comprehensive RFI Work Plan* (E/A&H, 1994).

5.7 Quality Assurance/Quality Control

QA/QC procedures to be followed during sampling activities will be in accordance with Section 4.14.2 of the *Comprehensive RFI Work Plan* (E/A&H, 1994).

5.8 Decontamination Procedures

Decontamination will be performed in accordance with Section 4.11 of the *Comprehensive RFI Work Plan* (E/A&H, 1994).

5.9 Investigation-Derived Waste

Investigation-derived waste (IDW) will be handled in accordance with Section 4.13 of the *Comprehensive RFI Work Plan* (E/A&H, 1994) and the *Investigation-Derived Waste Management Plan* (E/A&H, 1995). The contractor and/or the NSA Mid-South, PWD — ED will properly dispose of all IDW.

6.0 QUALITY ASSURANCE PLAN

The quality assurance procedures presented in Section 4.14 of the *Comprehensive RFI Work Plan* (E/A&H, 1994) will be followed for sampling activities at SWMU 17.

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7.0 DATA MANAGEMENT PLAN

The data management procedures presented in Section 5 of the *Comprehensive RFI Work Plan* (E/A&H, 1994) will be followed for sampling activities at SWMU 17.

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8.0 HEALTH AND SAFETY PLAN

Since EnSafe does not have responsibility for the soil removal, the contractor shall provide a written health and safety plan for removal activities for its employees which shall meet, at a minimum, the requirements specified in the EnSafe CHASP and include all site-specific information concerning types of activities, site contaminants, etc. The contractor's health and safety plan will be submitted to TDEC for review prior to its implementation. During confirmation sampling, EnSafe personnel will comply with the CHASP (Appendix D) and the SSHASP (Appendix E).

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9.0 REFERENCES

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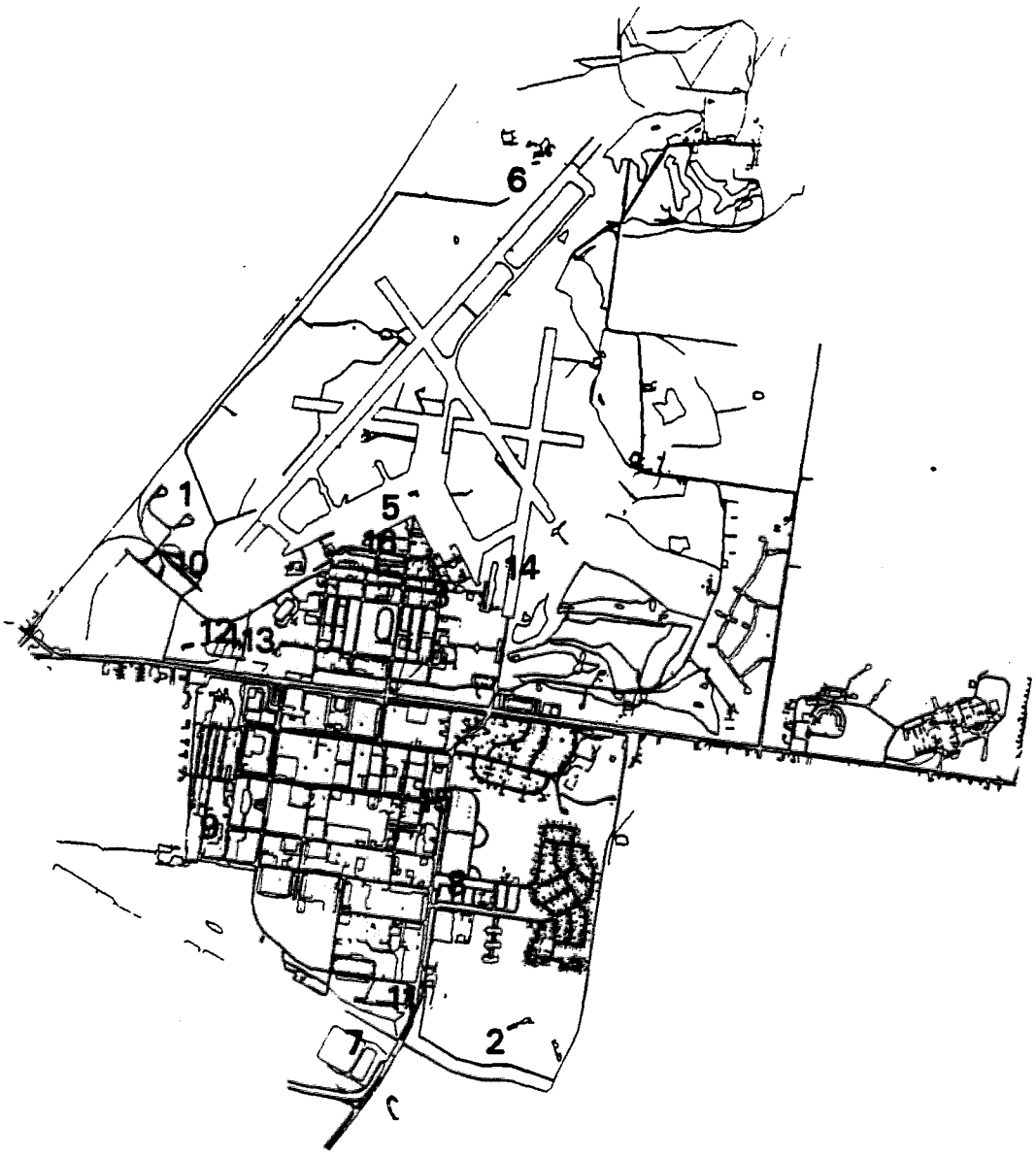
Appendix A

Permeability Data



LEGEND

1 SITE REFERENCE NUMBER

0 feet 6000

RCRA FACILITY INVESTIGATION NSA MEMPHIS MILLINGTON, TENNESSEE

FIGURE 1
SITE LOCATION AND REFERENCE

Table A.1
Loess/Shallow Alluvium Permeability Data Summary
NSA Memphis

Reference No.	Sample ID	Site	Depth	Date	Coefficient of Permeability (cm/sec)
1	NFFS005517	North Fuel Farm		03/17/97	2.20e-06
2	002S003019	002	19	02/26/96	2.30e-06
	002S002919	002	19	02/28/96	6.80e-07
3	003S000420	003	20	02/27/95	1.40e-07
4	005S000620	005	20	02/27/95	1.40e-07
5	007S000922	007	22	03/13/95	9.50e-07
6	008G02FL05	008	05	03/13/95	3.00e-08
7	009S01DA18	009	18	02/29/96	9.60e-07
8	014S01LF10	014	10	02/22/96	4.20e-07
9	059S03UF15	059	15	03/22/96	5.70e-07
10	060S003022	060	22	02/27/95	1.70e-07
11	065S06DA16	065	16	03/01/96	4.80e-06
12	MW-02	UST 1508	7	10/92	8.40e-08
	MW-02	UST 1508	11	10/92	8.60e-07
13	MW-11	UST 1489	7	10/92	6.30e-08
	MW-11	UST 1489	11	10/92	5.50e-08
14	SB-8	Former Flying Club	10	6/93	1.10e-06
15	SB-5	Bldg. S-50	8.5	8/93	3.80e-08
	SB-5	Bldg. S-50	13	8/93	1.30e-05
16		UST 304/1239		2/95	8.30e-06
		Minimum Value			3.00e-08
		Maximum Value			1.30e-05
		Average Value			1.84e-06

Appendix B

Tank Closure Report

KOESTER

ENVIRONMENTAL SERVICES, INC.

"Employee Owned"

Officer in Charge of NAVFAC Contracts
Post Office Box 54306 - NAS Memphis
Millington, Tennessee 38054-0306

UNDERGROUND STORAGE TANK
CLOSURE REPORT
for
UST S-9

Project No. 06-94-5218
Contract No. N62467-94--C-5218

November 25, 1996 / ST#5247A

Environmental Audit Report; Privileged Document

RECEIVED
MAR 17 1997
ROICC MEMPHIS

UNDERGROUND STORAGE TANK CLOSURE REPORT

PROVIDED TO

Officer in Charge of NAVFAC Contracts
P.O. Box 54306 - NAS Memphis
Millington, TN 38054-0306
Project No. 06-94-5218
Contract No. N62467-94--C-5218
Sub-Tech Job No. 5247A

FOR

UST S-9
November 25, 1996

Prepared By

Mr. Daniel D. Brown, Project Scientist

SUB-TECH, INC.®
A Koester Company - Environmental Services Division
7925 Burch Park Drive
Evansville, IN 47711-1787
Phone (812) 867-0100 / Fax (812) 867-4478

TABLE OF CONTENTS

APPENDICES

EXECUTIVE SUMMARY

This underground storage tank (UST) removal project located at the Naval Air Station Memphis, Millington, Tennessee, involved the removal of one 550 gallon waste oil UST.

The UST was removed on June 27, 1996 by Sub-Tech personnel. Approximately 42 gallons of sludge were removed from the UST and placed in a properly labeled 55 gallon drum. This sludge was delivered to building N-1694 for disposal by the Government.

Approximately 140 tons of contaminated soil were removed from the UST excavation. Preliminary determination of soil contamination was achieved through the use of olfactory, visual, and instrument assisted field screening. Final determination of contamination was achieved by laboratory analysis for parameters set forth in applicable sections of NAVFAC Specifications No. 06-95-5218. HydroLogic Laboratories, Inc., a Tennessee Department of Environmental and Conservation (TDEC) Certified laboratory, provided analytical services throughout this project.

Removal of this UST, associated piping, and residual waste is complete. The following UST closure report describes preparations, methods, procedures, and details associated with the project.

1.0 INTRODUCTION

1.1 Responsible Party Information

This report was prepared for the following Responsible Party:

Contracting Officer
P.O. Box 54306 - Naval Air Station, Memphis
Millington, TN 38054-0306

The following individuals served as representatives of the Contracting Officer throughout this project:

Ms. Linda Boyd
Assistant Resident Engineer in Charge of Construction

Mr. Randy Wilson
Environmental Protection Specialist

Mr. Mike Jones
Navy Construction Representative

1.2 Underground Storage Tank Contractor

The UST closure contractor's company name, address, Site representatives, and phone numbers are as follows:

Company:	Sub-Tech, Inc.
Address:	7925 Burch Park Drive
	Evansville, IN 47711-1787
License #:	00030817
Telephone:	(812) 867-0100
Fax:	(812) 867-4478

Site Representatives:
Mr. Jett Thomas - Project Manager
Mr. Dennis Jochem - Site Supervisor
Mr. Kelly Spahn - Site Safety Officer
Mr. Daniel Brown - Project Environmental Scientist

2.0 SITE DESCRIPTION

2.1 Site Location

The 550 gallon UST removed was located on the north side of Building S-9 (hereinafter referred to as the Site). The Site lies on the Naval Air Support Station - Memphis, at Millington, TN. A map showing the location of this Site is attached to the State of Tennessee Permanent Closure Report included with this closure report.

2.2 Site Surroundings

The UST Site is located in an asphalt parking lot immediately north of Building S-9. Building S-252 is located approximately 10 yards east of the Site. The Site is located in a portion of the naval station used for vehicle and general facility maintenance.

3.0 UST REMOVAL ACTIVITIES

3.1 UST Removal Preparations

Prior to UST removal, an Application for Permanent Closure of Underground Storage Tank Systems was submitted to Navy for review. The State Fire Marshall's office was informed of removal time and place. All known underground utilities were marked by Sub-Tech Personnel.

Safe work zones were identified by the Sub-Tech Safety Officer prior to UST removal, and clearly marked with yellow caution tape. Access to these zones was strictly controlled by the Sub-Tech Site Safety Officer. Seven roll-off boxes were delivered on Site by the Government for temporary containment of excavated soils. A staging area was prepared for cleaning and temporary storage of the excavated UST. Preparation of this area consisted of placing a minimum of 30 ml of polyethylene sheeting over soils present in the area. A map showing the location of these areas is attached to the State of Tennessee Permanent Closure Report included with this closure report.

Per NAVFAC Specifications No. 06-95-5218, Section 02082, page 9, 3.16.2 Fuel Removal, the Government removed fuel remaining in the UST prior to tank removal.

Underground piping associated with the UST was detached at its entry point into Buildings S-9 & S-252. The piping was drained with a pneumatic drum vac to ensure that no product remaining in the piping network would be released during UST removal. The piping entry point into Building S-9 & S-252 was sealed with concrete after piping was detached. Prior to UST removal, piping was uncovered with a concrete saw and backhoe, broken into sections, and removed.

3.2 UST Removal and Cleaning Procedures

Sub-Tech personnel removed UST S-9 on June 27, 1996. Personnel remained a safe distance from heavy equipment during this operation, and used pre-determined hand signals to maintain clear communications between workers and equipment operator. Upon removal from the excavation, the UST was visually inspected by Sub-Tech personnel. The fiberglass UST did not appear to have significant damage, however, some free product was observed to have leaked into the excavation. Approximately 350 gallons of trap water were removed from the excavation after UST removal.

The UST was staged on Site in a prearranged cleaning and storage area. Air inside the tank was monitored for hazardous conditions with an MSA Passport™ meter. After monitoring had ensured safe work conditions, the UST was cut open using pneumatic tools.

Tank cleaning was accomplished using several methods. First, a pneumatic drum vacuum was utilized to remove as much loose liquid sludge as possible. Second, Sub-Tech personnel entered the tank and used hand tools to remove sludge caked on interior walls. Finally, Sub-Tech personnel used absorbent pads to remove any remaining sludge and residue and power-washed the tank interior. Personnel performing cleaning operations were provided with chemical resistant coveralls, booties, and gloves, as well as full-face respirators with appropriate filter cartridges. A confined space entry permit was prepared by the Site Safety Officer prior to tank entry by Sub-Tech personnel.

Approximately 42 gallons of sludge were removed from the UST and placed in a 55 gallon drums The drum was labeled in accordance with all applicable State and Federal regulations. See Section 6.0 of this report, subpart 6.3 Disposal of Sludge for additional information concerning sludge disposal. Approximately 80 gallons of wash water were generated during tank cleaning and placed into 55 gallons drums. The drums were labeled in accordance with all applicable State and Federal regulations. See Section 6.0 of this report, subpart 6.5 Disposal of Trap Water and Rinsate for additional information concerning wash water disposal.

After cleaning, the UST was clearly marked in accordance with NAVFAC Specifications No. 06-95-5218, Section 02082, page 16, 3.22.4, Tank Removal.

3.3 Excavation and Backfilling of Soil and Other Materials

After removal of UST S-9, a 12" thick associated concrete slab, and two feet of surrounding backfill/soil, final excavation dimensions were 16' x 15' x 10'. Approximately 350 gallons of trap water were removed from the excavation after UST removal. See Section 6.0 of this report, subpart 6.5 Disposal of Trap Water and Rinsate for additional information concerning trap water disposal.

Excavated soils were stockpiled in roll-off boxes supplied by the Government. Soil which appeared to be contaminated due to visual, olfactory and photoionization detector (PID) screening was segregated from non-contaminated soils.

Approximately 95 cubic yards of soil were removed from the excavation. Based on visual examination, areas of contamination were prevalent on all sides and the bottom of the excavation. This contamination appeared to result from UST overfill. Laboratory analytical reports later confirmed that all soils which had appeared to be contaminated were contaminated with petroleum hydrocarbons.

3.4 Field Screening Procedures, Requirements, Results

As noted previously, field screening of excavated soils for petroleum contamination was conducted using visual and olfactory observations and PID instrumentation. Additionally, a Hanby ™ testing kit was used to provide more precise field screening results for certain screened samples. According to TDEC Technical Guidance Document 005, a minimum of 10 screen samples were required for an excavation of this size. Results of field screening are shown in Appendix A of this report.

4.0 SAMPLING ACTIVITIES

4.1 Soil Sample Procurement

A total of fourteen soil samples were taken and submitted for laboratory analysis during the removal of UST S-9. Two soil samples were taken from the bottom of the completed excavation, ten soil samples were taken along product piping lines, and a total of two composite soil sample were taken from roll-off boxes containing excavated soils. This sampling schematic was performed in accordance with specifications set forth in NAVFAC Specifications No. 06-95-5218, Section 02082, subsection 3.19 Soils Testing.

Location of sampling areas were determined using information provided in Figure I of TDEC UST System Closure Assessment Guidelines, as well as requirements set forth in NAVFAC Specifications No. 06-95-5218, Section 02082, subsection 3.19 Soils Testing.

4.2 Soil Sample Collection Procedures

Soil samples were obtained using disposable latex gloves. The gloves were discarded and replaced with new ones between each soil sample.

Soil samples collected were placed into clean glass jars provided by HydroLogic, Inc. The soil sample jars were packed full, leaving no headspace, and capped with a Teflon™ lined lid. No liquid preservatives were administered to the soil samples.

Each laboratory soil sample container was clearly labeled with non-smearing ink, to include at a minimum: job title, sample location, date, and required analysis. The label was covered with transparent tape to prevent deterioration of the label or writing. Soil sample containers were placed in sealable coolers and stored on ice for overnight delivery to HydroLogic, Inc.

4.3 Required Soil Sample Analysis

Soil samples were analyzed for the presence of contaminants in accordance with specifications set forth in NAVFAC Specifications No. 06-95-5218, Section 02082, subsection 3.19 Soils Testing.

Soil samples collected from the floor of the excavation were obtained from freshly exposed, undisturbed sections of soil. These samples were analyzed for the presence of benzene, toluene, ethylbenzene, and xylene (BTEX) utilizing EPA Method 8020,

total petroleum hydrocarbons (TPH) utilizing EPA Method 418.1, and Toxicity Characteristic Leaching Procedure (TCLP) for eight RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver).

Soil samples collected from stockpiles were also analyzed for the presence of BTEX and TPH, utilizing the same EPA methodology which was used for excavation samples. Stockpile soil samples with which were found to contain TPH 418.1 levels greater than or equal to 100 ppm, or benzene levels greater than or equal to 10 ppm, were further analyzed for TCLP benzene, TCLP lead, and TCLP TPH (utilizing EPA Methods 1311/8240, 1311/7420 and 1311/418.1, respectively).

Soil samples collected from product delivery piping trenches were analyzed for the presence of BTEX and TPH, utilizing the same EPA methodology which was used for excavation samples.

4.4 Liquid Waste (Sludge) Sample Collection

Petroleum sludge samples were collected using disposable latex gloves. The gloves were discarded and replaced with new ones between each sample. The sample was collected using a glass coliwasa sampling tube.

Sludge samples collected were placed into clean glass jars provided by HydroLogic, Inc., and capped with a Teflon™ lined lid. No liquid preservatives were administered to sludge samples.

Each laboratory sample container was clearly labeled with non-smearing ink, to include at a minimum: job title, sample location, date, and required analysis. The label was covered with transparent tape to prevent deterioration of the label or writing. Sludge sample containers were placed in sealable coolers and stored on ice for overnight delivery to HydroLogic, Inc.

4.5 Required Waste Analysis (Sludge)

Sludge samples were analyzed for the presence of hazardous characteristics in accordance with specifications set forth in NAVFAC Specifications No. 06-95-5218, Section 02082, subsection 3.16.4 Water, Waste Fuels, Sediment, and Sludge Analysis. Analyses were performed for the following: flash point utilizing EPA Method 1020, TCLP benzene utilizing EPA Method 1311/8240, and TCLP for eight RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver).

4.6 Liquid Waste (Trap Water, Rinsate) Sample Collection

Trap water and rinsate samples were collected using disposable latex gloves. The gloves were discarded and replaced with new ones between each sample. The sample was collected using a glass coliwasa sampling tube.

Trap water and rinsate samples collected were placed into clean glass jars provided by HydroLogic, Inc., and capped with a Teflon™ lined lid. No liquid preservatives were administered to the samples.

Each laboratory sample container was clearly labeled with non-smearing ink, to include at a minimum: job title, sample location, date, and required analysis. The label was covered with transparent tape to prevent deterioration of the label or writing. Sludge sample containers were placed in sealable coolers and stored on ice for overnight delivery to HydroLogic, Inc.

4.7 Required Waste Analysis (Trap Water, Rinsate)

Trap water and rinsate samples were analyzed for the presence of contaminants and other characteristics in accordance with specifications set forth in NAVFAC Specifications No. 06-95-5218, Section 02082, subsection 3.16.7 Wash Water, Detergent Solution, and Sediment Removal, and subsection 3.18.2 Excavation Methods.

Analyses were performed for the following: BTEX, TPH, pH, surfactant (MBAS), and total lead, utilizing EPA methods 8020, 418.1, 150.1, 425.1, and 239.2, respectively.

4.8 Decontamination Procedures

Soil samples were taken by hand, using new disposable latex gloves for each sample. Sludge, trap water, and rinsate samples were taken using new disposable glass coliwasa tubes. For these reasons, decontamination procedures for sampling were not necessary during this UST removal.

4.9 Sample Custody

Laboratory samples were shipped overnight to HydroLogic, Inc. in Murfreesboro, TN via Federal Express. When necessary, samples were transported from the Murfreesboro office to the HydroLogic office located in Frankfort, KY to test certain analytical parameters (Flash Pt., TCLP Benzene). Proper chain of custody procedures were utilized while obtaining and transporting samples. The date and time of the transfer as well as required analysis were included on the chain of custody. A copy of the chain of custody may be found in Appendix B of this closure report.

5.0 LABORATORY ANALYSIS

5.1 Laboratory Analytical Results

Tables containing analytical results from soil samples collected at the Site may be found in Appendix A of this closure report.

6.0 WASTE DISPOSAL DATA

6.1 Disposal of Contaminated Soil

Per specifications set forth in NAVFAC Specifications No. 06-95-5218, Section 02082, subsection 3.18.1 Excavation Procedures, contaminated soil removed during excavation was disposed of by the Government.

6.2 Disposal of Residual Product

All residual product was removed by the Government prior to Sub-Tech UST removal activities.

6.3 Disposal of Sludge

Approximately 42 gallons of sludge were removed during UST cleaning. This sludge was delivered to Building N-1694 for disposal by the Government, per specifications set forth in NAVFAC Specifications No. 06-95-5218, Section 02082, subsection 3.16.6.2 Delivery of Sludge to the Government.

6.4 Disposal of UST

The cleaned UST was crushed and disposed of by the Government as construction debris.

6.5 Disposal of Trap Water and Rinsate

Approximately 350 gallons of trap water were removed from the excavation prior to backfilling, and approximately 42 gallons of rinsate were generated during power washing of the fiberglass UST. These wastes were placed into properly labeled 55 gallons drums and stored on Site pending laboratory analysis. At the date this report was completed, these wastes were still present on Site awaiting disposal.

August 1996

STATE OF TENNESSEE
DIVISION OF UNDERGROUND STORAGE TANKS

PERMANENT CLOSURE REPORT

The Responsible Party (RP) of the underground storage tank (UST) system shall complete and submit the **original** of this report within 45 days of collecting samples during the UST system closure assessment. Tennessee Code Annotated (T.C.A.) §68-215-103(16) defines Responsible Party as the owner and/or operator of a petroleum site or any person who at the time of the release which caused the contamination was an owner and/or operator of a petroleum underground storage tank.

Include the following appendices in the report. Attach extra sheets if necessary.

Appendix A: A table containing the field screening and analytical results. All results shall be reported in parts per million (ppm). The results shall be properly identified and correlated with the sampling locations on the site map. If water was encountered during closure-in-place, include the monitoring well information required in the Environmental Assessment Guidelines.

Appendix B: The original or carbon copy of the laboratory analysis sheets. Photocopies are not acceptable. All laboratory analysis sheets shall include the information specified in the *UST System Closure Assessment Guidelines*.

Appendix C: Documentation for treatment and/or disposal of soil, sludge, liquid, tanks and piping (i.e. Application to Treat Petroleum Contaminated Soil, Solid Waste Permits, Landfill Disposal Manifests, etc.).

Appendix D: **A copy of the Amended Notification form shall be submitted with this report. Send the original Amended Notification form to the UST Nashville Central Office.**

1. UST Facility ID 0 - 791713

2. Facility Name Naval Air Station - Memphis

3. Division personnel with the appropriate field office were notified at least one working day before collecting soil samples for the UST system closure assessment. Yes___ No___ If yes:
   Person contacted_____
   Field office_____
   Date_____
   Reported by_____

4. The tank atmosphere and work zone were regularly tested with a combustible gas indicator in accordance with UST regulations Appendix 6(2) and (3). Yes X No___

5. Method of purging tank atmosphere:
Carbon dioxide gas___ Nitrogen___ Eductor-type air movers___
Diffused air blower___ Dry ice (1.5 lb/100 gal.) ___
Other N/A - Tank atmosphere was tested with an MSA Passport, and found to be below the LEL.

6. Product piping was drained into the tank. Yes___ No X

7. Product piping was: Capped___ Removed X

8. All liquid/sludge was removed from the UST system. Yes X No___
Not encountered___

9. Method of liquid/sludge storage: 55 gal. drum

Sludge was taken to Building N1694 by the Dept. of

10. Method of liquid/sludge disposal: Navy. Liquid to be delivered to Excel TSD, Inc.

Manifests included in Appendix C. Yes___ No___
Not applicable X

11. Tank was labeled in accordance with the UST Regulations Appendix 6(4)(f).
Yes X No___ Not applicable___

12. Method of UST system storage/disposal:
Cut up for disposal___ Stored on site___ Stored off site___
Other Crushed and Disposed of as construction debris

UST systems stored on site or off site are subject to Rules 1200-1-15-.07(2)(e), (f) and (g) and Appendix 7.

13. Location of UST system storage/disposal N/A

Certificate of disposal included in Appendix C. Yes___ No X

17. If no, explain Disposed of as construction debris

14. Amount of material excavated during UST system closure: 95 cubic yards.

15.

19

15. Total amount of contaminated material overexcavated after removal of the UST system:
0 cubic yards.
If more than 100 cubic yards of material was overexcavated, Division personnel in the appropriate field office should have been contacted.
Division personnel in the appropriate field office were contacted. Yes___ No___
Not applicable X
If yes:
Person contacted_____
Field Office_____
Date_____
Reported by_____

All excavated material remaining on the site of generation or on a site owned by the responsible party or subsidiary of the responsible party shall be placed on and covered with plastic and bermed. Sampling the excavated material in accordance with Technical Guidance Document - 005, must be completed prior to proper disposal.

If petroleum contaminated material is managed in accordance with Technical Guidance Document-009, the appropriate *Application to Treat Petroleum Contaminated Soil* shall be completed and submitted to the local field office for approval. If the contaminated material is to be treated on a site owned by a Third Party, contact the Tennessee Division of Solid Waste Management.

All excavations shall be backfilled with material containing levels at or below 5 ppm benzene and/or 100 ppm TPH.

16. Mark all that apply regarding the management of the excavated material:
Stockpiled on site___ Thermal treatment on site___ Thermal treatment off site___
Landfilled X Other_____

Documentation is included in Appendix C. Yes___ No X If no, explain why_____
_____

17. Explain why the method in #16 was chosen for management of the excavated material___
_____

18. All samples were placed directly into the appropriate containers, immediately after collection. Yes X No___

19. Immediately after collection all samples were placed on ice and maintained at 4°C until delivered to a Division approved laboratory. Yes X No___

Facility ID Number 0-791713

20. Laboratory confirmation of petroleum contamination or discovery of free product was reported to the Division within 72 hours. Yes___ No___ Not applicable X
If yes:
Person contacted_____
Field office_____
Date_____
Reported by_____

21. Water was encountered in the soil borings during closure-in-place.
Yes___ No___ Not applicable X
If encountered, was water sampled. Yes___ No___
Monitoring well information is in Appendix A. Yes___ No___
Analytical results are in Appendix B. Yes___ No___

22. Water was encountered during excavation of the UST system. Yes X No___
Amount of water removed: 400 gals.
Water recharged within 24 hours. Yes___ No X
Recharge water was sampled. Yes___ No X
Analytical results are in Appendix B. Yes___ No X
Method of water disposal:_____
Manifests included in Appendix C. Yes___ No X

23. If more than 500 gallons of water were removed, Division personnel in the appropriate field office should have been contacted.
Division personnel in the appropriate field office were contacted. Yes___ No___
Not applicable X
If yes:
Person contacted_____
Field Office_____
Date_____
Reported by_____

24. Bedrock was encountered during UST system removal/closure-in-place.
Yes___ No X
All contaminated material above the applicable cleanup level was excavated.
Yes___ No X Not applicable___
Soil was sampled from floor of excavation. Yes X No___
Analytical results are in Appendix B. Yes X No___

25. The original Notification Form reporting the closure of the tank system was submitted to the Nashville Central Office. Yes X No___

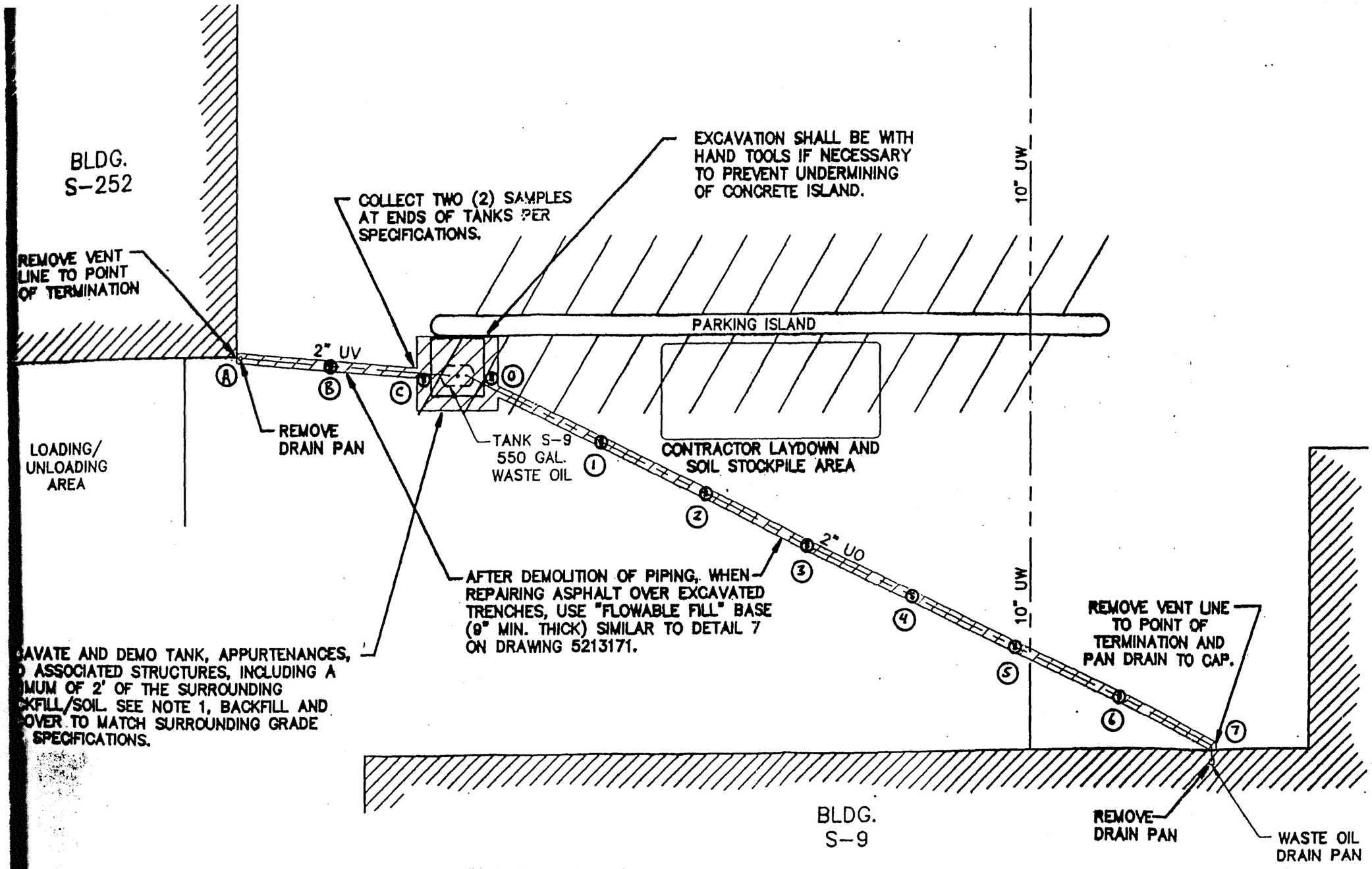
Facility ID Number 0-791713

26. **Failure to submit a Notification Form may result in the assessment of additional tank fees.**

THIS PERMANENT CLOSURE REPORT WILL NOT BE PROCESSED WITHOUT THE COMPLETION AND SUBMITTAL OF THE APPROPRIATE APPENDICES IN THEIR ENTIRETY.

27. An updated site map shall be provided in this space showing buildings, utilities, areas of overexcavation, borings, and sample points. The map shall also include soil stockpiles, their dimensions in feet, and properly labeled screening and sampling points. A measurement shall be included from one corner of the tank excavation to a permanent structure (i.e. building, power pole, fire hydrant, etc.). The site map shall include a north arrow.

See Attached Map.



PLAN VIEW

REF. THIS DRAWING

SCALE: 1" = 20'

MARK C. CHRISTIANSEN
REGISTERED
AGRICULTURE

Facility ID Number 0-791713

This signature page shall be signed by the RP (or authorized representative within the organization). If more than 100 cubic yards of material was overexcavated, the signature page shall also be signed by a registered professional geologist under the Tennessee Geologist Act (T.C.A. § 62-36-101 et seq.), a registered professional engineer under the Tennessee Architects, Engineers, and Landscape Architects, and Interior Designers Law and Rule (T.C.A. § 62-2-101 et seq.), or an Approved Corrective Action Contractor (Rule 1200-1-15-.09(15)).

I certify under penalty of law, including but not limited to penalties for perjury, that the information contained in this form and on any attachments is true, accurate and complete to the best of my knowledge, information and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for intentional violations.

UST system RP or RP's authorinzed representative (Print name)	Signature	Date
Title (Print)		
P.E., P.G., or CAC (Print name)	Signature	Date
TN Registration #	CAC Company (Print)	

Note: Each of the above signatures shall be notarized separately with the following statement.

STATE OF _____ COUNTY OF _____

Sworn to and subscribed before me by _____ on this date

_____. My commission expires _____.

Notary Public (Print name)	Signature	Date

Stamp/Seal

APPENDIX A - TABLE I
FIELD SCREENING* RESULTS
OF MATERIAL EXCAVATED FROM UST S-9

Screening Number	Method Used	Reading (ppm)	Notes
01	PID	3581	Pea gravel backfill - top 1' of excavation
02	PID	4411	Pea gravel backfill - top 2' of excavation
03	PID	3160	Pea gravel backfill - top 2' of excavation
04	PID	416	Pea gravel backfill - top 3' of excavation
05	PID	11.7	Pea gravel backfill - top 3' of excavation
06	PID	18.7	Gray clay backfill - top 5' of excavation
07	PID	47.8	Pea gravel backfill - top 5' of excavation
08	PID	72.9	Pea gravel backfill - top 6' of excavation
09	PID	90.2	Pea gravel backfill - top 6' of excavation
10	PID	43.2	Pea gravel backfill - top 7' of excavation
11	PID	19.4	Brownish clay from bottom side of excavation
12	PID	23.8	Brownish clay from bottom side of excavation
13	PID	50	Pea gravel backfill
14	PID	16.7	Pea gravel backfill
15	PID	79.6	Pea gravel backfill
16	PID	21.1	Trenching overburden
17	PID	39.4	Pea gravel backfill
18	PID	116.0	Pea gravel backfill
19	PID	82.2	Pea gravel backfill

* It should be noted that only field screening conducted with instrumentation are represented in this chart. A large number of field screenings using visual and olfactory determinations are also typically utilized by Sub-Tech personnel during tank removal activities.

APPENEDIX A - TABLE II LABORATORY ANALYTICAL RESULTS FROM MATERIAL EXCAVATED DURING REMOVAL OF UST S-9			
Sample ID	**Analyte**	**Results**	**Detection Limit**
Stockpile Cont.	Benzene (S)	<1.0 mg/kg	1.0 mg/kg
	Toluene (S)	<1.0 mg/kg	1.0 mg/kg
	Ethylbenzene (S)	<1.0 mg/kg	1.0 mg/kg
	Xylene (S)	<1.0 mg/kg	1.0 mg/kg
	TPH 418.1	2,080 mg/kg	10 mg/kg
	TCLP Lead	<0.1 mg/L	0.1 mg/L
	TCLP TPH 418.1	<1.0 mg/L	1.0 mg/L
	TCLP Benzene	BDL[a]	0.001 mg/L
Stockpile Clean	Benzene (S)	<1.0 mg/kg	1.0 mg/kg
	Toluene (S)	<1.0 mg/kg	1.0 mg/kg
	Ethylbenzene (S)	<1.0 mg/kg	1.0 mg/kg
	Xylene (S)	<1.0 mg/kg	1.0 mg/kg
	TPH 418.1	1,000 mg/kg	10 mg/kg
	TCLP Lead	<0.1 mg/L	0.1 mg/L
	TCLP TPH 418.1	<1.0 mg/L	1.0 mg/L
	TCLP Benzene	BDL	0.001 mg/L
[a] BDL - Below Detection Limit			

APPENDIX A - TABLE III LABORATORY ANALYTICAL RESULTS FROM SLUDGE COLLECTED DURING CLEANING OF UST S-9			
Sample ID	**Analyte**	**Results**	**Detection Limit**
S-9 UST (sludge)	TCLP RCRA metals		
	• arsenic	0.007 mg/L	0.001 mg/L
	• barium	0.5 mg/L	0.01 mg/L
	• cadmium	0.088mg/L	0.005 mg/L
	• chromium	0.29 mg/L	0.05 mg/L
	• lead	<0.1mg/L	0.1 mg/L
	• mercury	<0.0020 mg/L	0.0020 mg/L
	• selenium	<0.002 mg/L	0.002 mg/L
	• silver	<0.010mg/L	0.010 mg/L
	TCLP Benzene	0.0376 mg/L	0.001 mg/L
	Flash Point	>200 °F	N/A

APPENDIX A - TABLE IV LABORATORY ANALYTICAL RESULTS FOR TRAP WATER AND TANK RINSATE AT UST S-9			
Sample ID	**Analyte**	**Results**	**Detection Limit**
S-9 Trap Water	Benzene (S)	<0.001	0.001 mg/L
	Toluene (S)	<0.001 mg/L	0.001 mg/L
	Ethylbenzene (S)	<0.001 mg/L	0.001 mg/L
	Xylene (S)	0.010 mg/L	0.005 mg/L
	TPH 418.1	3,414 mg/L	10.0 mg/L
	pH	6.0	N/A
	Surfactant (MBAS)	4.8 mg/L	0.25 mg/L
	Total Lead	mg/L	mg/L
S-9 Rinsate	Benzene (S)	BDL	0.001 mg/L
	Toluene (S)	8.30 mg/L	0.200 mg/L
	Ethylbenzene (S)	15.0 mg/L	0.200 mg/L
	Xylene (S)	10.4 mg/L	0.200 mg/L
	TPH 418.1	7,578 mg/L	25.0 mg/L
	pH	7.4	N/A
	Surfactant (MBAS)	5.0 mg/L	0.25 mg/L
	Total Lead	2.25 mg/L	0.001 mg/L

APPENDIX A - TABLE V
LABORATORY ANALYTICAL RESULTS
FROM EXCAVATED PIT AND PIPE TRENCHING
AT UST S-9

Sample ID	Analyte	Results	Detection Limit
S-9 Bottom East	TCLP RCRA metals		
	• arsenic	0.003 mg/L	0.001 mg/L
	• barium	0.9 mg/L	0.1 mg/L
	• cadmium	0.006 mg/L	0.005 mg/L
	• chromium	<0.05 mg/L	0.05 mg/L
	• lead	<0.1 mg/L	0.1 mg/L
	• mercury	<0.0002 mg/L	0.0002 mg/L
	• selenium	<0.002 mg/L	0.002 mg/L
	• silver	<0.010 mg/L	0.010 mg/L
	Benzene (S)	<1.0 mg/kg	1.0 mg/kg
	Toluene (S)	<1.0 mg/kg	1.0 mg/kg
	Ethylbenzene (S)	<1.0 mg/kg	1.0 mg/kg
	Xylene (S)	<1.0 mg/kg	1.0 mg/kg
	TPH 418.1	2,380 mg/kg	10 mg/kg
S-9 Bottom West	TCLP RCRA metals		
	• arsenic	<0.001 mg/L	0.001 mg/L
	• barium	0.3 mg/L	0.1 mg/L
	• cadmium	<0.005 mg/L	0.005 mg/L
	• chromium	<0.05 mg/L	0.05 mg/L
	• lead	<0.1 mg/L	0.1 mg/L
	• mercury	<0.0002 mg/L	0.0002 mg/L
	• selenium	<0.002 mg/L	0.002 mg/L
	• silver	0.012 mg/L	0.010 mg/L
	Benzene (S)	<1.0 mg/kg	1.0 mg/kg
	Toluene (S)	<1.0 mg/kg	1.0 mg/kg
	Ethylbenzene (S)	<1.0 mg/kg	1.0 mg/kg
	Xylene (S)	<1.0 mg/kg	1.0 mg/kg
	TPH 418.1	6,820 mg/kg	10 mg/kg
Piping Run A	Benzene (S)	<1.0 mg/kg	1.0 mg/kg
	Toluene (S)	<1.0 mg/kg	1.0 mg/kg
	Ethylbenzene (S)	<1.0 mg/kg	1.0 mg/kg
	Xylene (S)	<1.0 mg/kg	1.0 mg/kg
	TPH 418.1	5,140 mg/kg	10.0 mg/kg

APPENDIX A - TABLE V (CONTINUED) LABORATORY ANALYTICAL RESULTS FROM EXCAVATED PIT AND PIPE TRENCHING AT UST S-9			
Piping Run B	Benzene (S) Toluene (S) Ethylbenzene (S) Xylene (S) TPH 418.1	<1.0 mg/kg <1.0 mg/kg <1.0 mg/kg <1.0 mg/kg 1,010 mg/kg	1.0 mg/kg 1.0 mg/kg 1.0 mg/kg 1.0 mg/kg 10.0 mg/kg
Piping Run C	Benzene (S) Toluene (S) Ethylbenzene (S) Xylene (S) TPH 418.1	<1.0 mg/kg <1.0 mg/kg <1.0 mg/kg <1.0 mg/kg 3,390 mg/kg	1.0 mg/kg 1.0 mg/kg 1.0 mg/kg 1.0 mg/kg 10.0 mg/kg
Piping Run 0	Benzene (S) Toluene (S) Ethylbenzene (S) Xylene (S) TPH 418.1	<1.0 mg/kg <1.0 mg/kg <1.0 mg/kg <1.0 mg/kg 2,240 mg/kg	1.0 mg/kg 1.0 mg/kg 1.0 mg/kg 1.0 mg/kg 10.0 mg/kg
Piping Run 1	Benzene (S) Toluene (S) Ethylbenzene (S) Xylene (S) TPH 418.1	<1.0 mg/kg <1.0 mg/kg <1.0 mg/kg <1.0 mg/kg 3,620 mg/kg	1.0 mg/kg 1.0 mg/kg 1.0 mg/kg 1.0 mg/kg 10.0 mg/kg
Piping Run 2	Benzene (S) Toluene (S) Ethylbenzene (S) Xylene (S) TPH 418.1	<1.0 mg/kg <1.0 mg/kg <1.0 mg/kg <1.0 mg/kg 860 mg/kg	1.0 mg/kg 1.0 mg/kg 1.0 mg/kg 1.0 mg/kg 10.0 mg/kg
Piping Run 3	Benzene (S) Toluene (S) Ethylbenzene (S) Xylene (S) TPH 418.1	<1.0 mg/kg <1.0 mg/kg <1.0 mg/kg <1.0 mg/kg 560 mg/kg	1.0 mg/kg 1.0 mg/kg 1.0 mg/kg 1.0 mg/kg 10.0 mg/kg
Piping Run 4	Benzene (S) Toluene (S) Ethylbenzene (S) Xylene (S) TPH 418.1	<1.0 mg/kg <1.0 mg/kg <1.0 mg/kg <1.0 mg/kg 1,320 mg/kg	1.0 mg/kg 1.0 mg/kg 1.0 mg/kg 1.0 mg/kg 10.0 mg/kg

APPENDIX A - TABLE V (CONTINUED) LABORATORY ANALYTICAL RESULTS FROM EXCAVATED PIT AND PIPE TRENCHING AT UST S-9			
Sample ID	**Analyte**	**Results**	**Detection Limit**
Piping Run 5	Benzene (S)	<1.0 mg/kg	1.0 mg/kg
	Toluene (S)	<1.0 mg/kg	1.0 mg/kg
	Ethylbenzene (S)	<1.0 mg/kg	1.0 mg/kg
	Xylene (S)	<1.0 mg/kg	1.0 mg/kg
	TPH 418.1	1,620 mg/kg	10.0 mg/kg
Piping Run 6	Benzene (S)	<1.0 mg/kg	1.0 mg/kg
	Toluene (S)	<1.0 mg/kg	1.0 mg/kg
	Ethylbenzene (S)	<1.0 mg/kg	1.0 mg/kg
	Xylene (S)	3.3 mg/kg	1.0 mg/kg
	TPH 418.1	92 mg/kg	10.0 mg/kg
Piping Run 7	Benzene (S)	<1.0 mg/kg	1.0 mg/kg
	Toluene (S)	<1.0 mg/kg	1.0 mg/kg
	Ethylbenzene (S)	<1.0 mg/kg	1.0 mg/kg
	Xylene (S)	<1.0 mg/kg	1.0 mg/kg
	TPH 418.1	3,000 mg/kg	10.0 mg/kg

FINAL REPORT OF ANALYSES

Sub-Tech, Inc
7925 Burch Park Dr.
Evansville, IN

REPORT DATE: 07/04/96

SAMPLE NUMBER- 16825 SAMPLE ID- Stockpile Cont SAMPLE MATRIX- SO
DATE SAMPLED- 06/28/96
DATE RECEIVED- 06/29/96 SAMPLER- D. Brown RECEIVED BY- KDS
TIME RECEIVED- 1030 DELIVERED BY- Fed X

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	DET. LIMIT
IRFRARED TPH SOLID	418.1	07/02/96	KDS	2,080	mg/kg	10
Benzene, Solid	8020	07/02/96	MMS	< 1.0	mg/kg	1.0
Toluene, Solid	8020	07/03/96	MMS	< 1.0	mg/kg	1.0
Ethylbenzene (S)	8020	07/03/96	MMS	< 1.0	mg/kg	1.
Xylene, Solid	8020	07/03/96	MMS	< 1.0	mg/kg	1.0

LABORATORY DIRECTOR Teresa W McClanahan

FINAL REPORT OF ANALYSES

)-Tech, Inc
)5 Burch Park Dr.
)nsville, IN

REPORT DATE: 07/17/96

PLE NUMBER- 16825 SAMPLE ID- Stockpile Cont SAMPLE MATRIX- SO
E SAMPLED- 06/28/96
E RECEIVED- 06/29/96 SAMPLER- D. Brown RECEIVED BY- KDS
E RECEIVED- 1030 DELIVERED BY- Fed X

e 1 of 1

LYSIS	METHOD	SAMPLE PREP DATE	BY	ANALYSIS DATE	BY	RESULT	UNITS	DET. LIMIT
RARED TPH SOLID	418.1			07/02/96	KDS	2,080	mg/kg	10
zene, Solid	8020			07/02/96	MMS	< 1.0	mg/kg	1.0
Solid	8020			07/03/96	MMS	< 1.0	mg/kg	1.0
zene (S)	8020			07/03/96	MMS	< 1.0	mg/kg	1.
, Solid	8020			07/03/96	MMS	< 1.0	mg/kg	1.0
P Lead	1311/7420	07/09/96	AKW	07/10/96	AKW	< 0.1	mg/L	0.1
P 418.1	1311/418.1			07/10/96	KDS	< 1.	mg/L	1.0

LABORATORY DIRECTOR Margaret Barlow

FINAL REPORT OF ANALYSES

Sub-Tech, Inc
7925 Burch Park Dr.
Evansville, IN

REPORT DATE: 07/04/96

SAMPLE NUMBER- 16824 SAMPLE ID- Stockpile Clena SAMPLE MATRIX- SO
DATE SAMPLED- 06/28/96
DATE RECEIVED- 06/29/96 SAMPLER- D. Brown RECEIVED BY- KDS
TIME RECEIVED- 1030 DELIVERED BY- Fed X

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	DET. LIMIT
IRFRARED TPH SOLID	418.1	07/02/96	KDS	1,000	mg/kg	10
Benzene, Solid	8020	07/02/96	MMS	< 1.0	mg/kg	1.0
[illegible]ene, Solid	8020	07/02/96	MMS	< 1.0	mg/kg	1.0
[illegible]lbenzene (S)	8020	07/02/96	MMS	< 1.0	mg/kg	1.0
Xylene, Solid	8020	07/02/96	MMS	< 1.0	mg/kg	1.0

LABORATORY DIRECTOR Gerald W. McClanahan

H Y D R O L O G I C , I N C .

FINAL REPORT OF ANALYSES

Tech, Inc
Burch Park Dr.
sville, IN

REPORT DATE: 07/17/96

LE NUMBER- 16824 SAMPLE ID- Stockpile Clena SAMPLE MATRIX- SO
SAMPLED- 06/28/96
RECEIVED- 06/29/96 SAMPLER- D. Brown RECEIVED BY- KDS
RECEIVED- 1030 DELIVERED BY- Fed X

1 of 1

SIS	METHOD	SAMPLE PREP DATE	BY	ANALYSIS DATE	BY	RESULT	UNITS	DET. LIMIT
RED TPH SOLID	418.1			07/02/96	KDS	1,000	mg/kg	10
ne, Solid	8020			07/02/96	MMS	< 1.0	mg/kg	1.0
ne, Solid	8020			07/02/96	MMS	< 1.0	mg/kg	1.0
be ne (S)	8020			07/02/96	MMS	< 1.0	mg/kg	1.0
, Solid	8020			07/02/96	MMS	< 1.0	mg/kg	1.0
ead	1311/7420	07/09/96	AKW	07/10/96	AKW	< 0.1	mg/L	0.1
418.1	1311/418.1			07/10/96	KDS	< 1.	mg/L	1.0

LABORATORY DIRECTOR Margaret Bullard

HYDROLOGIC, INC.

July 16, 1996

REPORTING:

HydroLogic, Inc.
410 New Salem Highway
Suite 106
Murfreesboro, TN 37129

Attention: Teresa McClanahan

INVOICING:

HydroLogic, Inc.
410 New Salem Highway
Suite 106
Murfreesboro, TN 37129

PROJECT NUMBER: FL9611258

DATE COMPLETED: July 16, 1996
DATE RECEIVED: July 9, 1996

PROJECT DESCRIPTION:

Sub: Tech. Inc./5247A-- 2 soil samples analyzed for TCLP Benzene.

Enclosed is the laboratory report for the project described above. If you have any questions or if we can be of further assistance, please feel free to contact Jamie Fore at 1-800-728-2251. We appreciate your business and look forward to serving you again soon.

Respectfully,

Walter Hogg
QA/QC Officer

1491 TWILIGHT TRAIL FRANKFORT, KY 40601
502-223-0251 FAX: 502-875-8016 / TOLL FREE 800-728-2251

HYDROLOGIC, INC.

COMPANY NAME: HydroLogic, Inc.
COMPANY PROJECT NUMBER: Sub. Tech. Inc./5247A

HYDROLOGIC PROJECT NUMBER: FL9611258
HYDROLOGIC SAMPLE NUMBER: 9611258
HYDROLOGIC LAB I.D.#: N/A
SAMPLE IDENTIFICATION: stockpile clean
DATE SAMPLED: 6/28/96

ANALYSIS	DATE/TIME EXTRACTED	DATE/TIME ANALYZED	METHOD	UNITS	SDL	RESULT
TCLP Benzene	7/14/96	7/15/96	1311/8240	mg/l	0.001	BDL

DL = Below Sample Detection Limit
DL = Sample Detection Limit

NOTES: _____

1491 TWILIGHT TRAIL FRANKFORT, KY 40601
502-223-0251 FAX: 502-875-8016 / TOLL FREE 800-728-2251

HYDROLOGIC, INC.

COMPANY NAME: HydroLogic, Inc.
COMPANY PROJECT NUMBER: Sub. Tech. Inc./5247A

HYDROLOGIC PROJECT NUMBER: FL9611258
HYDROLOGIC SAMPLE NUMBER: 9611259
HYDROLOGIC LAB I.D.#: N/A
SAMPLE IDENTIFICATION: stockpile cont
DATE SAMPLED: 6/28/96

ANALYSIS	DATE/TIME EXTRACTED	DATE/TIME ANALYZED	METHOD	UNITS	SDL	RESULT
TCLP Benzene	7/14/96	7/15/96	1311/8240	mg/l	0.001	BDL

BDL = Below Sample Detection Limit
SDL = Sample Detection Limit

COMMENTS: _____

1491 TWILIGHT TRAIL FRANKFORT, KY 40601
502-223-0251 FAX: 502-875-8016 / TOLL FREE 800-728-2251

FINAL REPORT OF ANALYSES

REPORT DATE: 07/11/96

SAMPLE ID- S-9 SLUDGE

SAMPLE MATRIX- SO
TIME SAMPLED- 1200
RECEIVED BY- KAB

SAMPLER- CLIENT
DELIVERED BY- FedEx

	METHOD	SAMPLE PREP DATE	BY	ANALYSIS DATE	BY	RESULT	UNITS	DET. LIMIT
Arsenic	1311/7061	07/09/96	AKW	07/10/96	ATR	0.007	mg/L	0.001
Barium	1311/7080	07/09/96	AKW	07/11/96	ATR	0.5	mg/L	0.1
Cadmium	1311/7130	07/09/96	AKW	07/11/96	AKW	0.088	mg/L	0.005
Chromium	1311/7190	07/09/96	AKW	07/10/96	AKW	0.29	mg/L	0.05
Lead	1311/7420	07/09/96	AKW	07/10/96	AKW	< 0.1	mg/L	0.1
Mercury	1311/7470	07/09/96	AKW	07/08/96	AKW	< 0.0020	mg/L	0.0020
Selenium	1311/7740	07/09/96	AKW	07/10/96	ATR	< 0.002	mg/L	0.002
Silver	1311/7760	07/09/96	AKW	07/10/96	AKW	< 0.010	mg/L	0.010

LABORATORY DIRECTOR Margaret Barlow

HYDROLOGIC, INC.

July 9, 1996

REPORTING:

HydroLogic, Inc.
410 New Salem Highway
Suite 106
Murfreesboro, TN 37129

Attention: Teresa McClanahan

INVOICING:

HydroLogic, Inc.
410 New Salem Highway
Suite 106
Murfreesboro, TN 37129

PROJECT NUMBER: FL9611070

DATE COMPLETED: July 9, 1996
DATE RECEIVED: July 3, 1996

PROJECT DESCRIPTION:

Sub-Tech, Inc./5247A—1 soil sample analyzed for TCLP(Benzene/Metals)/Flashpoint.

Enclosed is the laboratory report for the project described above. If you have any questions or if we can be of further assistance, please feel free to contact Jamie Fore at 1-800-728-2251. We appreciate your business and look forward to serving you again soon.

Respectfully,

Walter Hogg
QA/QC Officer

1491 TWILIGHT TRAIL FRANKFORT, KY 40601
502-223-0251 FAX: 502-875-8016 / TOLL FREE 800-728-2251

HYDROLOGIC, INC.

COMPANY NAME: HydroLogic, Inc.
COMPANY PROJECT NUMBER: Sub-Tech, Inc./5247A

HYDROLOGIC PROJECT NUMBER: FL9611070
HYDROLOGIC SAMPLE NUMBER: 9611070
HYDROLOGIC LAB I.D.#: N/A
SAMPLE IDENTIFICATION: S-9 SLUDGE
DATE SAMPLED: 7/1/96

ANALYSIS	DATE/TIME ANALYZED	METHOD	UNITS	SDL	RESULT
Benzene	7/08/96	Tclp Benzene	mg/L	0.001	0.0376
Flashpoint	7/05/96	1020	Deg F		>200

BDL = Below Sample Detection Limit
SDL = Sample Detection Limit

COMMENTS: _____

1491 TWILIGHT TRAIL FRANKFORT, KY 40601
502-223-0251 FAX: 502-875-8016 / TOLL FREE 800-728-2251

Y D R O L O G I C , I N C

FINAL REPORT OF ANALYSES

Tech, Inc
Burch Park Dr.
sville, IN

REPORT DATE: 07/04/96

.E NUMBER- 16819 SAMPLE ID- S-9 Trap Water SAMPLE MATRIX- WA
SAMPLED- 06/28/96 TIME SAMPLED- 830
RECEIVED- 06/29/96 SAMPLER- D. Brown RECEIVED BY- KDS
RECEIVED- 1030 DELIVERED BY- Fed X

1 of 1

'SIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	DET. LIMIT
AB	EPA 150.1	07/03/96	KAB	6.0	std units	
	EPA 425.1	07/03/96	JTA	4.8	mg/l	0.25
RED TPH LIQUID	418.1	07/03/96	KDS	3,414	mg/L	10
d 8020 (L)	8020	07/02/96	MMS			
ne	8020			< 0.001	mg/L	0.001
ne	8020			< 0.001	mg/L	0.001
benzene	8020			< 0.001	mg/L	0.001
e	8020			0.010	mg/L	0.005

LABORATORY DIRECTOR Teresa W McClanahan

FINAL REPORT OF ANALYSES

·Tech, Inc
; Burch Park Dr.
ısville, IN

REPORT DATE: 07/11/96

LE NUMBER- 16875 SAMPLE ID- S-9 Rinsate SAMPLE MATRIX- WA
SAMPLED- 07/01/96 TIME SAMPLED- 1200
RECEIVED- 07/02/96 SAMPLER- Client RECEIVED BY- KAB
RECEIVED- 900 DELIVERED BY- Fed X

1 of 1

YSIS	METHOD	SAMPLE PREP DATE	BY	ANALYSIS DATE	BY	RESULT	UNITS	DET. LIMIT
LAB	EPA 150.1			07/03/96	KAB	7.4	std units	
	EPA 425.1			07/03/96	JTA	5.0	mg/l	0.25
ARE TPH LIQUID	418.1			07/03/96	KDS	7,578	mg/L	25
L	239.2	07/05/96	ATR	07/11/96	ATR	2.25	mg/l	0.001
od 8020 (L)	8020			07/09/96	MMS			
ne	8020					BDL	mg/L	0.001
ne	8020					8.30	mg/L	0.200
benzene	8020					15.0	mg/L	0.200
e	8020					10.4	mg/L	0.200

LABORATORY DIRECTOR Margaret Barlow

H Y D R O L O G I C , I N C

FINAL REPORT OF ANALYSES

)-Tech, Inc
25 Burch Park Dr.
ansville, IN

REPORT DATE: 07/04/96

MPLE NUMBER- 16821 SAMPLE ID- S-9 Bottom East SAMPLE MATRIX- SO
TE SAMPLED- 06/28/96 TIME SAMPLED- 940
TE RECEIVED- 06/29/96 SAMPLER- D. Brown RECEIVED BY- KDS
ME RECEIVED- 1030 DELIVERED BY- Fed X

ge 1 of 1

ALYSIS	METHOD	SAMPLE PREP DATE	BY	ANALYSIS DATE	BY	RESULT	UNITS	DET. LIMIT
FRARED TPH SOLID	418.1			07/02/96	KDS	2,380	mg/kg	10
nzene, Solid	8020			07/02/96	MMS	< 1.0	mg/kg	1.0
Solid	8020			07/02/96	MMS	< 1.0	mg/kg	1.0
nzene (S)	8020			07/02/96	MMS	< 1.0	mg/kg	1.0
Solid	8020			07/02/96	MMS	< 1.0	mg/kg	1.0
P Arsenic	1311/7061	07/01/96	ATR	07/02/96	ATR	0.003	mg/L	0.001
P Barium	1311/7080	07/01/96	ATR	07/03/96	ATR	0.9	mg/L	0.1
P Cadmium	1311/7130	07/01/96	ATR	07/03/96	ATR	0.006	mg/L	0.005
P Chromium	1311/7190	07/01/96	ATR	07/03/96	ATR	< 0.05	mg/L	0.05
P Lead	1311/7420	07/01/96	ATR	07/03/96	ATR	< 0.1	mg/L	0.1
P Mercury	1311/7470	07/01/96	ATR	07/03/96	ATR	< 0.0002	mg/L	0.0002
P Selenium	1311/7740	07/01/96	ATR	07/03/96	ATR	< 0.002	mg/L	0.002
P Silver	1311/7760	07/01/96	ATR	07/03/96	ATR	< 0.010	mg/L	0.010

LABORATORY DIRECTOR Teresa W McClanahan

410 New Salem Hwy. • Suite 106 • Murfreesboro, TN 37129 • (615) 848-6810 • FAX (615) 848-6805

FINAL REPORT OF ANALYSES

Tech, Inc
Burch Park Dr.
sville, IN

REPORT DATE: 07/04/96

LE NUMBER- 16820 SAMPLE ID- S-9 Bottom West
SAMPLED- 06/28/96
RECEIVED- 06/29/96 SAMPLER- D. Brown
RECEIVED- 1030 DELIVERED BY- Fed X

SAMPLE MATRIX- SO
TIME SAMPLED- 945
RECEIVED BY- KDS

1 of 1

YSIS	METHOD	SAMPLE PREP DATE	BY	ANALYSIS DATE	BY	RESULT	UNITS	DET. LIMIT
ARED TPH SOLID	418.1			07/02/96	KDS	6,820	mg/kg	10
enz Solid	8020			07/02/96	MMS	< 1.0	mg/kg	1.0
e Solid	8020			07/03/96	MMS	< 1.0	mg/kg	1.0
henzene (S)	8020			07/03/96	MMS	< 1.0	mg/kg	1.0
Solid	8020			07/03/96	MMS	5.6	mg/kg	1.0
Arsenic	1311/7061	07/01/96	ATR	07/02/96	ATR	< 0.001	mg/L	0.001
Barium	1311/7080	07/01/96	ATR	07/03/96	ATR	0.3	mg/L	0.1
Cadmium	1311/7130	07/01/96	ATR	07/03/96	ATR	< 0.005	mg/L	0.005
Chromium	1311/7190	07/01/96	ATR	07/03/96	ATR	< 0.05	mg/L	0.05
Lead	1311/7420	07/01/96	ATR	07/03/96	ATR	< 0.1	mg/L	0.1
Mercury	1311/7470	07/01/96	ATR	07/03/96	ATR	< 0.0002	mg/L	0.0002
Selenium	1311/7740	07/01/96	ATR	07/03/96	ATR	< 0.002	mg/L	0.002
Silver	1311/7760	07/01/96	ATR	07/03/96	ATR	0.012	mg/L	0.010

LABORATORY DIRECTOR Margaret Bailey

FINAL REPORT OF ANALYSES

Sub-Tech, Inc
7925 Burch Park Dr.
Evansville, IN

REPORT DATE: 07/04/96

SAMPLE NUMBER- 16823 SAMPLE ID- Piping Run A SAMPLE MATRIX- SO
DATE SAMPLED- 06/28/96
DATE RECEIVED- 06/29/96 SAMPLER- D. Brown RECEIVED BY- KDS
TIME RECEIVED- 1030 DELIVERED BY- Fed X

Page 1 of 1

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	DET. LIMIT
IRFRARED TPH SOLID	418.1	07/02/96	KDS	5,140	mg/kg	10
Benzene, Solid	8020	07/02/96	MMS	< 1.0	mg/kg	1.0
T[illegible]ne, Solid	8020	07/02/96	MMS	< 1.0	mg/kg	1.0
F[illegible]benzene (S)	8020	07/02/96	MMS	< 1.0	mg/kg	1.0
[illegible]ene, Solid	8020	07/02/96	MMS	< 1.0	mg/kg	1.0

LABORATORY DIRECTOR Teresa W McClanahan

FINAL REPORT OF ANALYSES

Sub-Tech, Inc
7925 Burch Park Dr.
Evansville, IN

REPORT DATE: 07/04/96

SAMPLE NUMBER- 16862 SAMPLE ID- Piping Run B SAMPLE MATRIX- SO
DATE SAMPLED- 06/28/96
DATE RECEIVED- 06/29/96 SAMPLER- D. Brown RECEIVED BY- KDS
TIME RECEIVED- 1030 DELIVERED BY- Fed X

Page 1 of 1

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	DET. LIMIT
IRFRARED TPH SOLID	418.1	07/02/96	KDS	1,010	mg/kg	10
Benzene, Solid	8020	07/03/96	MMS	< 1.0	mg/kg	1.0
To[illegible]e, Solid	8020	07/03/96	MMS	< 1.0	mg/kg	1.0
[illegible]benzene (S)	8020	07/03/96	MMS	< 1.0	mg/kg	1.0
[illegible]ene, Solid	8020	07/03/96	MMS	< 1.0	mg/kg	1.0

LABORATORY DIRECTOR Teresa W McClanahan

FINAL REPORT OF ANALYSES

ub-Tech, Inc
925 Burch Park Dr.
vansville, IN

REPORT DATE: 07/04/96

AMPLE NUMBER- 16863 SAMPLE ID- Piping Run C SAMPLE MATRIX- SO
ATE SAMPLED- 06/28/96
ATE RECEIVED- 06/29/96 SAMPLER- D. Brown RECEIVED BY- KDS
IME RECEIVED- 1030 DELIVERED BY- Fed X

age 1 of 1

NALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	DET. LIMIT
RFRARED TPH SOLID	418.1	07/02/96	KDS	3,390	mg/kg	10
en e, Solid	8020	07/03/96	MMS	< 1.0	mg/kg	1.0
ol e, Solid	8020	07/03/96	MMS	< 1.0	mg/kg	1.0
yl benzene (S)	8020	07/03/96	MMS	< 1.0	mg/kg	1.0
ene, Solid	8020	07/03/96	MMS	< 1.0	mg/kg	1.0

LABORATORY DIRECTOR Teresa W McClanahan

FINAL REPORT OF ANALYSES

Sub-Tech, Inc
7925 Burch Park Dr.
Evansville, IN

REPORT DATE: 07/04/96

SAMPLE NUMBER- 16822 SAMPLE ID- Piping Run 0 SAMPLE MATRIX- SO
DATE SAMPLED- 06/28/96
DATE RECEIVED- 06/29/96 SAMPLER- D. Brown RECEIVED BY- KDS
TIME RECEIVED- 1030 DELIVERED BY- Fed X

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	DET. LIMIT
IRFRARED TPH SOLID	418.1	07/02/96	KDS	2,240	mg/kg	10
Benzene, Solid	8020	07/02/96	MMS	< 1.0	mg/kg	1.0
[illegible]ne, Solid	8020	07/02/96	MMS	< 1.0	mg/kg	1.0
[illegible]benzene (S)	8020	07/02/96	MMS	< 1.0	mg/kg	1.0
[illegible]ene, Solid	8020	07/02/96	MMS	< 1.0	mg/kg	1.0

LABORATORY DIRECTOR Teresa (W) McClanahan

FINAL REPORT OF ANALYSES

ub-Tech, Inc
925 Burch Park Dr.
vansville, IN

REPORT DATE: 07/04/96

AMPLE NUMBER- 16855 SAMPLE ID- Piping Run 1 SAMPLE MATRIX- SO
ATE SAMPLED- 06/28/96
ATE RECEIVED- 06/29/96 SAMPLER- D. Brown RECEIVED BY- KDS
IME RECEIVED- 1030 DELIVERED BY- Fed X

age 1 of 1

NALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	DET. LIMIT
RFRARED TPH SOLID	418.1	07/02/96	KDS	3,620	mg/kg	10
enzene, Solid	8020	07/02/96	MMS	< 1.0	mg/kg	1.0
ene, Solid	8020	07/02/96	MMS	< 1.0	mg/kg	1.0
ylbenzene (S)	8020	07/02/96	MMS	< 1.0	mg/kg	1.0
ene, Solid	8020	07/02/96	MMS	< 1.0	mg/kg	1.0

LABORATORY DIRECTOR Teresa (R) McClanahan

H Y D R O L O G I C , I N C

FINAL REPORT OF ANALYSES

Sub-Tech, Inc
7925 Burch Park Dr.
Evansville, IN

REPORT DATE: 07/04/96

SAMPLE NUMBER- 16856 SAMPLE ID- Piping Run 2 SAMPLE MATRIX- SO
DATE SAMPLED- 06/28/96
DATE RECEIVED- 06/29/96 SAMPLER- D. Brown RECEIVED BY- KDS
TIME RECEIVED- 1030 DELIVERED BY- Fed X

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	DET. LIMIT
IRFRARED TPH SOLID	418.1	07/02/96	KDS	860	mg/kg	10
Benzene, Solid	8020	07/03/96	MMS	< 1.0	mg/kg	1.0
To[illegible]e, Solid	8020	07/03/96	MMS	< 1.0	mg/kg	1.0
Ethylbenzene (S)	8020	07/03/96	MMS	< 1.0	mg/kg	1.0
[illegible]ene, Solid	8020	07/03/96	MMS	< 1.0	mg/kg	1.0

LABORATORY DIRECTOR Theresa W McClanahan

FINAL REPORT OF ANALYSES

Sub-Tech, Inc
7925 Burch Park Dr.
Evansville, IN

REPORT DATE: 07/04/96

SAMPLE NUMBER- 16857 SAMPLE ID- Piping Run 3 SAMPLE MATRIX- SO
DATE SAMPLED- 06/28/96
DATE RECEIVED- 06/29/96 SAMPLER- D. Brown RECEIVED BY- KDS
TIME RECEIVED- 1030 DELIVERED BY- Fed X

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	DET. LIMIT
IRFRARED TPH SOLID	418.1	07/02/96	KDS	560	mg/kg	10
Benzene, Solid	8020	07/02/96	MMS	< 1.0	mg/kg	1.0
[illegible]ne, Solid	8020	07/02/96	MMS	< 1.0	mg/kg	1.0
[illegible]benzene (S)	8020	07/02/96	MMS	< 1.0	mg/kg	1.0
ene, Solid	8020	07/02/96	MMS	< 1.0	mg/kg	1.0

LABORATORY DIRECTOR Margaret Barlow

FINAL REPORT OF ANALYSES

ub-Tech, Inc
925 Burch Park Dr.
vansville, IN

REPORT DATE: 07/04/96

AMPLE NUMBER- 16858 SAMPLE ID- Piping Run 4 SAMPLE MATRIX- SO
ATE SAMPLED- 06/28/96
ATE RECEIVED- 06/29/96 SAMPLER- D. Brown RECEIVED BY- KDS
IME RECEIVED- 1030 DELIVERED BY- Fed X

age 1 of 1

NALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	DET. LIMIT
RFRARED TPH SOLID	418.1	07/02/96	KDS	1,320	mg/kg	10
enzene, Solid	8020	07/03/96	MMS	< 1.0	mg/kg	1.0
ıe, Solid	8020	07/03/96	MMS	< 1.0	mg/kg	1.0
benzene (S)	8020	07/03/96	MMS	< 1.0	mg/kg	1.0
ne, Solid	8020	07/03/96	MMS	< 1.0	mg/kg	1.0

LABORATORY DIRECTOR Teresa W McClanahan

FINAL REPORT OF ANALYSES

ub-Tech, Inc
925 Burch Park Dr.
vansville, IN

REPORT DATE: 07/04/96

AMPLE NUMBER- 16859 SAMPLE ID- Piping Run 5 SAMPLE MATRIX- SO
ATE SAMPLED- 06/28/96
ATE RECEIVED- 06/29/96 SAMPLER- D. Brown RECEIVED BY- KDS
IME RECEIVED- 1030 DELIVERED BY- Fed X

age 1 of 1

NALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	DET. LIMIT
RFRARED TPH SOLID	418.1	07/02/96	KDS	1,620	mg/kg	10
zene, Solid	8020	07/03/96	MMS	< 1.0	mg/kg	1.0
ene, Solid	8020	07/03/96	MMS	< 1.0	mg/kg	1.0
ylbenzene (S)	8020	07/03/96	MMS	< 1.0	mg/kg	1.0
ene, Solid	8020	07/03/96	MMS	< 1.0	mg/kg	1.0

LABORATORY DIRECTOR Teresa W McClanahan

FINAL REPORT OF ANALYSES

ub-Tech, Inc
925 Burch Park Dr.
vansville, IN

REPORT DATE: 07/04/96

AMPLE NUMBER- 16860 SAMPLE ID- Piping Run 6 SAMPLE MATRIX- SO
ATE SAMPLED- 06/28/96
ATE RECEIVED- 06/29/96 SAMPLER- D. Brown RECEIVED BY- KDS
IME RECEIVED- 1030 DELIVERED BY- Fed X

age 1 of 1

NALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	DET. LIMIT
RFRARED TPH SOLID	418.1	07/02/96	KDS	92	mg/kg	10
enzene, Solid	8020	07/03/96	MMS	< 1.0	mg/kg	1.0
ol , Solid	8020	07/03/96	MMS	< 1.0	mg/kg	1.0
hy enzene (S)	8020	07/03/96	MMS	< 1.0	mg/kg	1.0
ene, Solid	8020	07/03/96	MMS	3.3	mg/kg	1.0

LABORATORY DIRECTOR Teresa D McClanahan

FINAL REPORT OF ANALYSES

ıb-Tech, Inc
)25 Burch Park Dr.
ransville, IN

REPORT DATE: 07/04/96

MPLE NUMBER- 16861 SAMPLE ID- Piping Run 7 SAMPLE MATRIX- SO
TE SAMPLED- 06/28/96
TE RECEIVED- 06/29/96 SAMPLER- D. Brown RECEIVED BY- KDS
ME RECEIVED- 1030 DELIVERED BY- Fed X

ge 1 of 1

ALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	DET. LIMIT
FRARED TPH SOLID	418.1	07/02/96	KDS	3,000	mg/kg	10
nz[illegible], Solid	8020	07/03/96	MMS	< 1.0	mg/kg	1.0
l[illegible], Solid	8020	07/03/96	MMS	< 1.0	mg/kg	1.0
[illegible]benzene (S)	8020	07/03/96	MMS	< 1.0	mg/kg	1.0
.ne, Solid	8020	07/03/96	MMS	< 1.0	mg/kg	1.0

LABORATORY DIRECTOR Teresa W McClanahan

(704)254-3169 FAX (704) 253-[illegible] | (615) 848-6810 FAX (615) 848-6805 | (502) 223-0251 FAX (502) 875-8016 | (910) 738-6190 FAX (910) 671-8837 | (704) 786-3322 FAX (704) 786-2999 | (919) 380-9699 FAX (919) 380-9717 | (912) 757-0811 FAX (912) 757-0149 | (813) 597-6059 FAX (813) 597-7056

Client: Su[illegible]Tech. Inc.	Project No.: 5247 A
Report Address: 7925 Birch PK.	Invoice Address: Same
Evansville, IN 47711	
Attn: Robert Fisher	Attn: Same
Phone No.: 812/867-0100	Sampled By: D. Brown
Fax No.: 812/867-4478	P.O. No: 5247 A

TURNAROUND TIME

☐ 24 Hours ☒ 48 Hours Date Needed: _____

☐ 5 Days ☐ 10 Days ☐ Other _____

REQUESTED PARAMETERS

LAB CODE I.D.
A = Asheville, NC
C = Concord, NC
D = Denver, CO
G = Macon, GA
K = Frankfort, KY
L = Lumberton, NC
M = Morrisville, NC
N = Naples, FL
S = Subcontracted
T = Murfreesboro, T

Sample ID	Date	Time	Comp/ Grab	Matrix	Preserv.	Containers	BTEX 8020	TPH 418.1	PH	Surfactant (MBAS)	Lead	TCLP RCRA Metals (*)					REMARKS
S-4 Trip Water	6/28	830	Grab	H2O	None	2	X	X	X	X	X						16819
S-4 Bottom West	"	945	"	Soil	"	1	X	X				X					16820
S-4 Bottom East	"	940	"	"	"	1	X	X				X					16821
9 Piping Run 0-7	"	See Jars	"	"	"	8	X	X									16822 ?
9 Piping Run A-C	"	"	"	"	"	3	X	X									16823 ?
9 Stockpile Clean	"	"	"	"	"	1	X	X									16824
9 Stockpile Cont.	"	"	"	"	"	2	X	X									16825
Piping Run 1-7																	16355 - 16861
Piping Run B-C																	16862 - 16863

Lab Use Only | Custody Seal: ☐ Yes ☐ No ☐ N/A | Init Lab Temp. | Rec. Lab Temp

COMMENTS: * Arsenic, barium, cadmium, chromium, Lead, mercury, selenium, Silver

Relinquished By:	Date	Time	Received By:	Date	Time	State Samples Collected:
			K. Smith	6/29	10:32	
Relinquished By:	Date	Time	Received By:	Date	Time	Lab Use Only
Relinquished By:	Date	Time	Received By:	Date	Time	
Relinquished By:	Date	Time	Received By:	Date	Time	

Asheville, [illegible] (704) 254-5[illegible] FAX (704) 25[illegible]

2960 New Salem Highway #108, Murfreesboro, TN 37129 (615) 848-6810 FAX (615) 848-6805

1491 Twilight Trail, Frankfort, KY 40601 (502) 223-1251 FAX (502) 875-8016

2003 North Pine, Lumberton, NC 28358 (910) 738-6190 FAX (910) 671-8837

263 Branchview Drive SE, Concord, NC 28025 (704) 786-3322 FAX (704) 786-2999

2500 Gateway Centre, Morrisville, NC 27560 (919) 380-9699 FAX (919) 380-9717

4875 Riverside Drive, Macon, GA 31210 (912) 757-0811 FAX (912) 757-0149

2082 Trade Ctr Way #1, Naples, FL 33942 (813) 597-6059 FAX (813) 597-7056

Client: Sub-Tech, Inc.	Project No.: 5247.A
Report Address: 7925 Burch PK.	Invoice Address: Same
Evansville, IN 47711	
Attn: Robert Fisher	Attn: Same
Phone No.: 812/867-0100	Sampled By:
Fax No.: 812/867-4478	P.O. No: 5247 A

TURNAROUND TIME

☐ 24 Hours ☒ 48 Hours Date Needed: due 7/9

☐ 5 Days ☐ 10 Days ☐ Other

REQUESTED PARAMETERS

LAB CODE I.D.
A = Asheville, NC
C = Concord, NC
D = Denver, CO
G = Macon, GA
K = Frankfort, KY
L = Lumberton, NC
M = Morrisville, NC
N = Naples, FL
S = Subcontracted
T = Murfreesboro, TN

Sample ID	Date	Time	Comp/Grab	Matrix	Preserv.	Containers	BTEX 8020	TPH 418.1	PH	Surfactant (MBAS)	Lead	Flash Pt.	TCLP Benzene	TCLP RCRA Metals ⊛	REMARKS
S-9 Sludge	7-1-96	12:00PM	"	Sludge	N/A	2						X	X	X	
S-9 Rinsate	7-1-96	12:00PM	"	H_2O	"	"	X	X	X	X	X				16875
												K	K	T	

Lab Use Only — Custody Seal: ☐ Yes ☐ No ☐ N/A — Init Lab Temp. — Rec. Lab Temp.

COMMENTS: ⊛ Arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver

Relinquished By:	Date	Time	Received By:	Date	Time	State Samples Collected:
[signature]	7-1-96	6:00PM	Fed Ex			
Relinquished By:	Date	Time	Received By: Jim Bearden	7/2/96	9:00	
Relinquished By:	Date	Time	Received By:	Date	Time	
Relinquished By:	Date	Time	Received By:	Date	Time	

122 I... Asheville, N... (704)254-516... FAX (704) 252-97...

410 New Salem Highway #106 ... (615) ... FAX (615) ...

1491 Twilight Trail Frankfort, KY 40601 ... FAX (502) ...

2003 North Pine Lumberton, NC 28358 (910) 738-6190 FAX (910) 671-8837

263 Branchview Drive SE ... Concord, NC 28025 (704) 786-3322 FAX (704) 786-2999

2500 Gateway Centre Morrisville, NC 27560 (919) 380-9699 FAX (919) 380-9717

4875 Riverside Drive Macon, GA 31210 (912) 757-0811 FAX (912) 757-0149

2082 Trade Ctr Way # Naples, FL 33942 (813) 597-6059 FAX (813) 597-7056

FT96110?0

Client: Sub-Tech, Inc.	Project No.: 5247.A
Report Address: 7925 Burch Pk. Evansville, IN 47711	Invoice Address: Same
Attn: Robert Fisher	Attn: Same
Phone No.: 812/867-0100	Sampled By:
Fax No.: 812/867-4478	P.O. No: 5247 A

TURNAROUND TIME

☐ 24 Hours ☒ 48 Hours Date Needed: due 7/9

☐ 5 Days ☐ 10 Days ☐ Other

REQUESTED PARAMETERS

LAB CODE I.D.
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S = Subcontracted
T = Murfreesboro, TN

Sample ID	Date	Time	Comp/Grab	Matrix	Preserv.	Containers	BTEX 8020	TPH 418.1	PH	Surfactant (MBAS)	Lead	Flash Pt.	TCLP Benzene	TCLP RCRA Metals ⊛	REMARKS
S-9 Sludge	7-1-96	12:00PM	"	Sludge	N/A	2						X	X	X	Broken, only 1 forwarded
S-9 Rinsate	7-1-96	12:00PM	~	H_2O	"	"	X	X	X	X	X				
												K	K	T	

Lab Use Only Custody Seal: ☐ Yes ☐ No ☐ N/A Init Lab Temp: Rec. Lab Temp

COMMENTS: ⊛ Arsenic, barium, cadmium, chromium, Lead, mercury, Selenium, silver,

Relinquished By:	Date	Time	Received By: Fed Ex	Date	Time	State Samples Collected:	
Relinquished By:	Date	Time	Received By: Kenn Bearden	7/2/96	Time	Lab Use Only	
Relinquished By: Kenn Bearden	7/2/96	Time	Received By: C J Ramey	7-3-96	11:00 Time		
Relinquished By:	Date	Time	Received By:	Date	Time		

Documentation for treatment and/or disposal of tanks and piping is not applicable.

These materials were cleaned, crushed and disposed of as construction debris.

Notification for Underground Storage Tanks

State Agency Name and Address

STATE USE ONLY
ID NUMBER
DATE RECEIVED
A. Date Entered Into Computer
B. Data Entry Clerk Initials
C. Owner Was Contacted to Clarify Responses, Comments

TYPE OF NOTIFICATION

☐ A. NEW FACILITY ☐ B. AMENDED ☒ C. CLOSURE

____ No. of tanks at facility ____ No. of continuation sheets attached

INSTRUCTIONS

Please type or print in ink all items except "signature" in section V. This form must be completed for each location containing underground storage tanks. If more than five (5) tanks are owned at this location, photocopy the following sheets, and staple continuation sheets to the form.

GENERAL INFORMATION

Notification is required by Federal law for all underground tanks that have been used to store regulated substances since January 1, 1974, that are in the ground as of May 8, 1986, or that are brought into use after May 8, 1986. The information requested is required by Section 9002 of the Resource Conservation and Recovery Act, (RCRA), as amended.

The primary purpose of this notification program is to locate and evaluate underground tanks that store or have stored petroleum or hazardous substances. It is expected that the information you provide will be based on reasonably available records, or in the absence of such records, your knowledge, belief, or recollection.

Who Must Notify? Section 9002 of RCRA, as amended, requires that, unless exempted, owners of underground tanks that store regulated substances must notify designated State or local agencies of the existence of their tanks. Owner means—

a) In the case of an underground storage tank in use on November 8, 1984, or brought into use after that date, any person who owns an underground storage tank used for the storage, use, or dispensing of regulated substances, and

b) In the case of any underground storage tank in use before November 8, 1984, but no longer in use on that date, any person who owned such tank immediately before the discontinuation of its use.

c) If the State agency so requires, any facility that has undergone any changes to facility information or tank system status (only amended tank information needs to be included).

What Tanks Are Included? Underground storage tank is defined as any one or combination of tanks that (1) is used to contain an accumulation of "regulated substances," and (2) whose volume (including connected underground piping) is 10% or more beneath the ground. Some examples are underground tanks storing: 1. Gasoline, used oil, or diesel fuel, and 2. industrial solvents, pesticides, herbicides or fumigants.

What Tanks Are Excluded? Tanks removed from the ground are not subject to notification. Other tanks excluded from notification are:

1. farm or residential tanks of 1,100 gallons or less capacity used for storing motor fuel for noncommercial purposes;
2. tanks used for storing heating oil for consumptive use on the premises where stored;
3. septic tanks;
4. pipeline facilities (including gathering lines) regulated under the Natural Gas Pipeline Safety Act of 1968, or the Hazardous Liquid Pipeline Safety Act of 1979, which is an interstate pipeline facility regulated under State laws;
5. surface impoundments, pits, ponds, or lagoons;
6. storm water or waste water collection systems;
7. flow-through process tanks;
8. liquid traps or associated gathering lines directly related to oil or gas production and gathering operations;
9. storage tanks situated in an underground area (such as a basement, cellar, mineworking, drift, shaft, or tunnel) if the storage tank is situated upon or above the surface of the floor.

What Substances Are Covered? The notification requirements apply to underground storage tanks that contain regulated substances. This includes any substance defined as hazardous in section 101 (14) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), with the exception of those substances regulated as hazardous waste under Subtitle C RCRA. It also includes petroleum, e.g., crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute).

Where To Notify? Send completed forms to:

Underground Storage Tank Division
200 Doctor's Building
706 Church Street
Tennessee Department of Health and Environment
Nashville, TN 37247-4101

When To Notify? 1. Owners of underground storage tanks in use or that have been taken out of operation after January 1, 1974, but still in the ground, must notify by May 8, 1986. 2. Owners who bring underground storage tanks into use after May 8, 1986, must notify within 30 days of bringing the tanks into use. 3. If the State requires notification of any amendments to facility, send information to State agency immediately.

Penalties: Any owner who knowingly fails to notify or submits false information shall be subject to a civil penalty not to exceed $10,000 for each tank for which notification is not given or for which false information is submitted.

I. OWNERSHIP OF TANK(S)

Owner Name (Corporation, Individual, Public Agency, or Other Entity)

Street Address

NAVSUPPACT Memphis (Formerly NAS Memphis)

7800 Third Avenue Code 0101

City: Millington State: Tennessee Zip Code: 38054-0007

County: Shelby

Phone Number (Include Area Code): 901/873-5461

II. LOCATION OF TANK(S)

If required by State, give the geographic location of tanks by degrees, minutes, and seconds. Examples: Lat. 42, 34, 12 N Long. 85, 24, 17W

Latitude 35°20'04" Longitude 89°52'44"

(If same as Section I, mark box here ☐)

Facility Name or Company Site Identifier, as applicable

Same

Street Address (P.O. Box not acceptable)

Same

City State Zip code

County Municipality

PA 3197

Page

IV. INDIAN LANDS

☒ Federal Government ☐ Commercial ☐ State Government ☐ Private ☐ Local Government	Tanks are located on land within an Indian Reservation or on other trust lands. ☐ Tanks are owned by native American nation, tribe, or individual. ☐	Tribe or Nation:

V. TYPE OF FACILITY

Select the Appropriate Facility Description

____ Gas Station	____ Railroad	____ Trucking/Transport
____ Petroleum Distributor	____ Federal - Non-Military	____ Utilities
____ Air Taxi (Airline)	X Federal - Military	____ Residential
____ Aircraft Owner	____ Industrial	____ Farm
____ Auto Dealership	____ Contractor	____ Other (Explain) ____

VI. CONTACT PERSON IN CHARGE OF TANKS

Name	Job Title	Address	Phone Number (Include Area Code)
Randy Wilson	Env. Protection Specialist.	NAVSUPPACT Memphis 7800 3rd Ave., Code 0101 Millington, TN 38054-0007	901/873-5461

VII. FINANCIAL RESPONSIBILITY

I have met the financial responsibility requirements in accordance with 40 CFR Subpart H ☐

Check All that Apply

☐ Self Insurance	☐ Guarantee	☐ State Funds
☐ Commercial Insurance	☐ Surety Bond	☐ Trust Fund
☐ Risk Retention Group	☐ Letter of Credit	☐ Other Method Allowed Specify ____

VIII. CERTIFICATION (Read and sign after completing all sections)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete.

Name and official title of owner or owner's authorized representative (Print)	Signature	Date Signed

PA estimates public reporting burden for this form to average 30 minutes per response including time for reviewing instructions, athering and maintaining the data needed and completing and reviewing the form. Send comments regarding this burden estimate to hief, Information Policy Branch PM-223, U.S. Environmental Protection Agency, 401 M Street, Washington D.C. 20460, marked ttention Desk Officer for EPA." This form amends the previous notification form as printed in 40 CFR Part 280, Appendix I. Previous itions of this notification form may be used while supplies last.

UNDERGROUND STORAGE TANKS (Complete for each tank at this location.)

Tank Identification Number	Tank No. S-9	Tank No. ____	Tank No. ____	Tank No. ____	Tank No. ____
1. Status of Tank (mark only one) — Currently in Use					
Temporarily Out of Use					
Permanently Out of Use	YES				
Amendment of Information					
2. Date of Installation (mo./year)					
3. Estimated Total Capacity (gallons)	550				
4. Material of Construction (Mark all that apply)					
Asphalt Coated or Bare Steel					
Cathodically Protected Steel					
Epoxy Coated Steel					
Composite (Steel with Fiberglass)					
Fiberglass Reinforced Plastic	YES				
Lined Interior					
Double Walled					
Polyethylene Tank Jacket					
Concrete					
Excavation Liner					
Unknown					
Other, Please specify					
Has tank been repaired?	N/A				
5. Piping (Material) (Mark all that apply) — Bare Steel	YES				
Galvanized Steel					
Fiberglass Reinforced Plastic					
Copper					
Cathodically Protected					
Double Walled					
Secondary Containment					
Unknown					
Other, Please specify					
6. Piping (Type) (Mark all that apply)					
Suction: no valve at tank					
Suction: valve at tank					
Pressure					
Gravity Feed					
Has piping been repaired?	NO				

Tank Identification Number	Tank No. 5-Y	Tank No. ____	Tank No. ____	Tank No. ____	Tank No. ____
7. Substance Currently or Last Stored in Greatest Quantity by Volume					
Gasoline					
Diesel					
Gasohol					
Kerosene					
Heating Oil					
Used Oil	YES				
Other. Please specify					
Hazardous Substance CERCLA name and/or. CAS number	N/A				
Mixture of Substances Please specify					

X. TANKS OUT OF USE, OR CHANGE IN SERVICE

1. Closing of Tank					
A. Estimated date last used (mo./day/year)	05/01/96				
B. Estimate date tank closed (mo./day/year)	06/27/96				
C. Tank was removed from ground	YES				
D. Tank was closed in ground					
E. Tank filled with inert material Describe					
F. Change in service					
2. Site Assessment Completed	YES				
Evidence of a leak detected	YES				

Tank Identification Number	Tank No.____		Tank No.____		Tank No.____		Tank No.____		Tank No.____	
1. Installation										
A. Installer certified by tank and piping manufacturers	☐		☐		☐		☐		☐	
B. Installer certified or licensed by the implementing agency	☐		☐		☐		☐		☐	
C. Installation inspected by a registered engineer	☐		☐		☐		☐		☐	
D. Installation inspected and approved by implementing agency	☐		☐		☐		☐		☐	
E. Manufacturer's installation check-lists have been completed	☐		☐		☐		☐		☐	
F. Another method allowed by State agency. Please specify.	☐		☐		☐		☐		☐	
2. Release Detection (Mark all that apply)	TANK	PIPING	TANK	PIPING	TANK	PIPING	TANK	PIPING	TANK	PIPING
A. Manual tank gauging	☐		☐		☐		☐		☐	
B. Tank tightness testing	☐		☐		☐		☐		☐	
C. Inventory controls	☐		☐		☐		☐		☐	
D. Automatic tank gauging	☐		☐		☐		☐		☐	
E. Vapor monitoring	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
F. Groundwater monitoring	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
G. Interstitial monitoring double walled tank/piping	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
H. Interstitial monitoring/secondary containment	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
I. Automatic line leak detectors	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
J. Line tightness testing		☐		☐		☐		☐		☐
K. Other method allowed by Implementing Agency. Please specify.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	_____		_____		_____		_____		_____	
3. Spill and Overfill Protection										
A. Overfill device installed	☐		☐		☐		☐		☐	
B. Spill device installed	☐		☐		☐		☐		☐	

OATH: I certify the information concerning installation that is provided in section X is true to the best of my belief and knowledge.

Installer:

_____ Name

_____ Signature

_____ Date

_____ Position

_____ Company

Appendix C

Laboratory Results

NSA MID-SOUTH
CSI, ASSEMBLY F
SWMU 17

APX9-METAL							
	SAMPLE ID ------->	017-S-0001-01					
	ORIGINAL ID ----->	017S000101					
	LAB SAMPLE ID --->	150964S					
	ID FROM REPORT -->	017S000101					
	SAMPLE DATE ----->	06/28/96					
	MATRIX ---------->	Soil					
	UNITS ----------->	NG/KG					
CAS #	Parameter	1918	VAL				
7440-36-0	Antimony	9.	J				
7440-38-2	Arsenic	2.5	J				
7440-39-3	Barium	108.					
7440-41-7	Beryllium	0.45	J				
7440-43-9	Cadmium	2.8					
7440-47-3	Chromium	10.9	J				
7440-48-4	Cobalt	8.	J				
7440-50-8	Copper	19.5					
7439-92-1	Lead	14.4	J				
7439-97-6	Mercury	0.13	U				
7440-02-0	Nickel	18.8					
7782-49-2	Selenium	0.26	U				
7440-22-4	Silver	0.78	UJ				
7440-28-0	Thallium	0.52	U				
7440-62-2	Vanadium	21.6					
7440-66-6	Zinc	55.7					
7440-31-5	Tin	25.4	J				

*** Validation Complete ***

NSA MID-SOUTH
CSI, ASSEMBLY F
SWMU 17

SOLVT SCAN							
	SAMPLE ID ------->	017-V-0001-01	017-V-0002-01				
	ORIGINAL ID ----->	017V000101	017V000201				
	LAB SAMPLE ID --->	151041	151042				
	ID FROM REPORT -->	017V000101	017V000201				
	SAMPLE DATE ----->	07/01/96	07/01/96				
	DATE ANALYZED --->	07/15/96	07/15/96				
	MATRIX ---------->	Water	Water				
	UNITS ----------->	UG/G	UG/G				
CAS #	Parameter	1919	1919				
64-17-5	Ethanol	5. U	5. U				
67-56-1	Methanol	1. U	1. U				
71-36-3	n-Butyl alcohol	1. U	1. U				
71-23-8	n-Propyl Alcohol	1. U	1. U				

NSA MID-SOUTH
CSI, ASSEMBLY F
SWMU 17

SW846-PCB								
	SAMPLE ID ------->	017-V-0001-01		017-V-0002-01				
	ORIGINAL ID ----->	017V000101		017V000201				
	LAB SAMPLE ID --->	151041		151042				
	ID FROM REPORT -->	017V000101		017V000201				
	SAMPLE DATE ----->	07/01/96		07/01/96				
	DATE EXTRACTED -->	07/08/96		07/08/96				
	DATE ANALYZED --->	07/26/96		07/26/96				
	MATRIX ---------->	Soil		Soil				
	UNITS ---------->	ug/Kg		ug/Kg				
CAS #	Parameter	1919		1919				
12674-11-2	Aroclor-1016	38.	U	43.	U			
11104-28-2	Aroclor-1221	38.	U	43.	U			
11141-16-5	Aroclor-1232	38.	U	43.	U			
53469-21-9	Aroclor-1242	38.	U	43.	U			
12672-29-6	Aroclor-1248	38.	U	43.	U			
11097-69-1	Aroclor-1254	38.	U	43.	U			
11096-82-5	Aroclor-1260	38.	U	43.	U			

NSA MID-SOUTH
CSI, ASSEMBLY F
SWMU 17

SW846-PEST

SAMPLE ID ------->	017-S-0001-01
ORIGINAL ID ----->	017S000101
LAB SAMPLE ID --->	150964RE
ID FROM REPORT -->	017S000101
SAMPLE DATE ----->	06/28/96
DATE EXTRACTED -->	07/08/96
DATE ANALYZED --->	07/27/96
MATRIX ---------->	Soil
UNITS ----------->	ug/Kg

CAS #	Parameter	1918	VAL
319-84-6	alpha-BHC	2.1	U
319-85-7	beta-BHC	2.1	U
319-86-8	delta-BHC	2.1	U
58-89-9	gamma-BHC (Lindane)	2.1	U
76-44-8	Heptachlor	2.1	U
309-00-2	Aldrin	2.1	U
1024-57-3	Heptachlor epoxide	2.3	J
959-98-8	Endosulfan I	2.1	U
60-57-1	Dieldrin	4.3	U
72-55-9	4,4'-DDE	4.8	J
72-20-8	Endrin	5.6	
33213-65-9	Endosulfan II	4.4	J
72-54-8	4,4'-DDD	3.8	J
1031-07-8	Endosulfan sulfate	4.3	U
50-29-3	4,4'-DDT	2.4	J
72-43-5	Methoxychlor	21.	U
53494-70-5	Endrin ketone	4.3	U
7421-93-4	Endrin aldehyde	2.3	J
5103-71-9	alpha-Chlordane	2.6	J
5103-74-2	gamma-Chlordane	2.1	U
8001-35-2	Toxaphene	43.	U
12674-11-2	Aroclor-1016	43.	U
11104-28-2	Aroclor-1221	43.	U
11141-16-5	Aroclor-1232	43.	U
53469-21-9	Aroclor-1242	43.	U
12672-29-6	Aroclor-1248	43.	U
11097-69-1	Aroclor-1254	43.	U
11096-82-5	Aroclor-1260	43.	U
12789-03-6	Technical Chlordane	43.	U

*** Validation Complete ***

NSA MID-SOUTH
CSI, ASSEMBLY F
SWMU 17

SW846-SVOA

SAMPLE ID ------->	017-S-0001-01
ORIGINAL ID ----->	017S000101
LAB SAMPLE ID --->	150964
ID FROM REPORT -->	017s000101
SAMPLE DATE ----->	06/28/96
DATE EXTRACTED -->	07/05/96
DATE ANALYZED --->	07/08/96
MATRIX ---------->	Soil
UNITS ----------->	ug/Kg

CAS #	Parameter	1918	VAL
108-95-2	Phenol	8800.	U
111-44-4	bis(2-Chloroethyl)ether	8800.	U
95-57-8	2-Chlorophenol	8800.	U
541-73-1	1,3-Dichlorobenzene	8800.	U
106-46-7	1,4-Dichlorobenzene	8800.	U
95-50-1	1,2-Dichlorobenzene	8800.	U
95-48-7	2-Methylphenol (o-Cresol)	8800.	U
108-60-1	2,2'-oxybis(1-Chloropropane)	8800.	U
106-44-5	4-Methylphenol (p-Cresol)	8800.	U
621-64-7	N-Nitroso-di-n-propylamine	8800.	U
67-72-1	Hexachloroethane	8800.	U
98-95-3	Nitrobenzene	8800.	U
78-59-1	Isophorone	8800.	U
88-75-5	2-Nitrophenol	8800.	U
105-67-9	2,4-Dimethylphenol	8800.	U
120-83-2	2,4-Dichlorophenol	8800.	U
120-82-1	1,2,4-Trichlorobenzene	8800.	U
91-20-3	Naphthalene	8700.	J
106-47-8	4-Chloroaniline	8800.	U
87-68-3	Hexachlorobutadiene	8800.	U
111-91-1	bis(2-Chloroethoxy)methane	8800.	U
59-50-7	4-Chloro-3-methylphenol	8800.	U
91-57-6	2-Methylnaphthalene	15000.	
77-47-4	Hexachlorocyclopentadiene	8800.	UJ
88-06-2	2,4,6-Trichlorophenol	8800.	U
95-95-4	2,4,5-Trichlorophenol	22000.	U
91-58-7	2-Chloronaphthalene	8800.	U
88-74-4	2-Nitroaniline	22000.	U
131-11-3	Dimethylphthalate	8800.	U
208-96-8	Acenaphthylene	8800.	U
606-20-2	2,6-Dinitrotoluene	8800.	U
99-09-2	3-Nitroaniline	22000.	U
83-32-9	Acenaphthene	8800.	U
51-28-5	2,4-Dinitrophenol	22000.	U
100-02-7	4-Nitrophenol	22000.	U
132-64-9	Dibenzofuran	8800.	U

*** Validation Complete ***

NSA MID-SOUTH
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SWMU 17

SW846-SVOA

SAMPLE ID ------->	017-S-0001-01
ORIGINAL ID ----->	017S000101
LAB SAMPLE ID --->	150964
ID FROM REPORT -->	017s000101
SAMPLE DATE ----->	06/28/96
DATE EXTRACTED -->	07/05/96
DATE ANALYZED --->	07/08/96
MATRIX ---------->	Soil
UNITS ----------->	ug/Kg

CAS #	Parameter	1918	VAL
121-14-2	2,4-Dinitrotoluene	8800.	U
84-66-2	Diethylphthalate	8800.	U
7005-72-3	4-Chlorophenylphenyl ether	8800.	U
86-73-7	Fluorene	8800.	U
100-01-6	4-Nitroaniline	22000.	U
534-52-1	2-Methyl-4,6-Dinitrophenol	22000.	U
86-30-6	N-Nitrosodiphenylamine	8800.	U
101-55-3	4-Bromophenyl-phenylether	8800.	U
118-74-1	Hexachlorobenzene	8800.	U
87-86-5	Pentachlorophenol	22000.	U
85-01-8	Phenanthrene	1100.	J
120-12-7	Anthracene	8800.	U
86-74-8	Carbazole	8800.	U
84-74-2	Di-n-butylphthalate	8800.	U
206-44-0	Fluoranthene	8800.	U
129-00-0	Pyrene	8800.	U
85-68-7	Butylbenzylphthalate	8800.	U
91-94-1	3,3'-Dichlorobenzidine	8800.	U
56-55-3	Benzo(a)anthracene	8800.	U
218-01-9	Chrysene	8800.	U
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)	8800.	U
117-84-0	Di-n-octylphthalate	8800.	U
205-99-2	Benzo(b)fluoranthene	8800.	U
207-08-9	Benzo(k)fluoranthene	8800.	U
50-32-8	Benzo(a)pyrene	8800.	U
193-39-5	Indeno(1,2,3-cd)pyrene	8800.	U
53-70-3	Dibenz(a,h)anthracene	8800.	U
191-24-2	Benzo(g,h,i)perylene	8800.	U

*** Validation Complete ***

NSA MID-SOUTH
CSI, ASSEMBLY F
SWMU 17

SW846-VOA

SAMPLE ID ------->	017-S-0001-01
ORIGINAL ID ----->	017S000101
LAB SAMPLE ID --->	150964
ID FROM REPORT -->	017S000101
SAMPLE DATE ----->	06/28/96
DATE ANALYZED --->	07/02/96
MATRIX ---------->	Soil
UNITS ----------->	ug/Kg

CAS #	Parameter	1918	VAL
74-87-3	Chloromethane	130.	U
74-83-9	Bromomethane	130.	U
75-01-4	Vinyl chloride	130.	U
75-00-3	Chloroethane	130.	U
75-09-2	Methylene chloride	130.	U
67-64-1	Acetone	130.	UJ
75-15-0	Carbon disulfide	130.	U
75-35-4	1,1-Dichloroethene	130.	U
75-34-3	1,1-Dichloroethane	130.	U
540-59-0	1,2-Dichloroethene (total)	130.	U
67-66-3	Chloroform	130.	U
107-06-2	1,2-Dichloroethane	130.	U
78-93-3	2-Butanone (MEK)	130.	U
71-55-6	1,1,1-Trichloroethane	130.	U
56-23-5	Carbon tetrachloride	130.	U
75-27-4	Bromodichloromethane	130.	U
78-87-5	1,2-Dichloropropane	130.	U
10061-01-5	cis-1,3-Dichloropropene	130.	U
79-01-6	Trichloroethene	130.	U
124-48-1	Dibromochloromethane	130.	U
79-00-5	1,1,2-Trichloroethane	130.	U
71-43-2	Benzene	130.	U
10061-02-6	trans-1,3-Dichloropropene	130.	U
75-25-2	Bromoform	130.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	130.	U
591-78-6	2-Hexanone	130.	U
127-18-4	Tetrachloroethene	17.	J
79-34-5	1,1,2,2-Tetrachloroethane	130.	U
108-88-3	Toluene	140.	
108-90-7	Chlorobenzene	130.	U
100-41-4	Ethylbenzene	370.	
100-42-5	Styrene	31.	J
1330-20-7	Xylene (Total)	1400.	

*** Validation Complete ***

NSA MID-SOUTH
CSI, ASSEMBLY F
SWMU 17

TCLP-METAL								
	SAMPLE ID ------->	017-V-0001-01		017-V-0002-01				
	ORIGINAL ID ----->	017V000101		017V000201				
	LAB SAMPLE ID --->	151041S		151042S				
	ID FROM REPORT -->	017V000101		017V000201				
	SAMPLE DATE ----->	07/01/96		07/01/96				
	MATRIX ---------->	Water		Water				
	UNITS ----------->	UG/L		UG/L				
CAS #	Parameter	1919		1919				
7440-38-2	Arsenic	500.	U	500.	U			
7440-39-3	Barium	1880.		1380.				
7440-43-9	Cadmium	50.	U	50.	U			
7440-47-3	Chromium	25.	U	25.	U			
7439-92-1	Lead	300.	U	300.	U			
7439-97-6	Mercury	2.	U	2.	U			
7782-49-2	Selenium	200.	U	200.	U			
7440-22-4	Silver	50.	U	50.	U			

NSA MID-SOUTH
CSI, ASSEMBLY F
SWMU 17

TCLP-SVOA							
	SAMPLE ID ------->	017-V-0001-01		017-V-0002-01			
	ORIGINAL ID ----->	017V000101		017V000201			
	LAB SAMPLE ID --->	151041		151042			
	ID FROM REPORT -->	017V000101		017V000201			
	SAMPLE DATE ----->	07/01/96		07/01/96			
	DATE EXTRACTED -->	07/16/96		07/16/96			
	DATE ANALYZED --->	07/22/96		07/22/96			
	MATRIX ---------->	Water		Water			
	UNITS ----------->	ug/L		ug/L			
CAS #	Parameter	1919		1919			
106-46-7	1,4-Dichlorobenzene	200.	U	200.	U		
67-72-1	Hexachloroethane	200.	U	200.	U		
98-95-3	Nitrobenzene	200.	U	200.	U		
87-68-3	Hexachlorobutadiene	200.	U	200.	U		
88-06-2	2,4,6-Trichlorophenol	200.	U	200.	U		
95-95-4	2,4,5-Trichlorophenol	500.	U	500.	U		
121-14-2	2,4-Dinitrotoluene	200.	U	200.	U		
118-74-1	Hexachlorobenzene	200.	U	200.	U		
87-86-5	Pentachlorophenol	500.	U	500.	U		
110-86-1	Pyridine	200.	U	200.	U		
9999900-00-1	Methylphenol (Total Cresol)	200.	U	200.	U		

NSA MID-SOUTH
CSI, ASSEMBLY F
SWMU 17

TCLP-VOA							
	SAMPLE ID ------->	017-V-0001-01		017-V-0002-01			
	ORIGINAL ID ----->	017V000101		017V000201			
	LAB SAMPLE ID --->	151041		151042			
	ID FROM REPORT -->	017v000101		017v000201			
	SAMPLE DATE ----->	07/01/96		07/01/96			
	DATE ANALYZED --->	07/16/96		07/16/96			
	MATRIX ---------->	Water		Water			
	UNITS ----------->	ug/L		ug/L			
CAS #	Parameter	1919		1919			
75-01-4	Vinyl chloride	50.	U	50.	U		
75-35-4	1,1-Dichloroethene	50.	U	50.	U		
67-66-3	Chloroform	50.	U	50.	U		
107-06-2	1,2-Dichloroethane	50.	U	50.	U		
78-93-3	2-Butanone (MEK)	50.	U	50.	U		
56-23-5	Carbon tetrachloride	50.	U	50.	U		
79-01-6	Trichloroethene	50.	U	50.	U		
71-43-2	Benzene	50.	U	50.	U		
127-18-4	Tetrachloroethene	50.	U	50.	U		
108-90-7	Chlorobenzene	50.	U	50.	U		

NSA MID-SOUTH
CSI, ASSEMBLY F
SWMU 17

TPH							
	SAMPLE ID ------->	017-V-0001-01	017-V-0002-01				
	ORIGINAL ID ----->	017V000101	017V000201				
	LAB SAMPLE ID --->	151041	151042				
	ID FROM REPORT -->	017V000101	017V000201				
	SAMPLE DATE ----->	07/01/96	07/01/96				
	DATE EXTRACTED -->	07/09/96	07/09/96				
	DATE ANALYZED --->	07/16/96	07/16/96				
	MATRIX ---------->	Soil	Soil				
	UNITS ----------->	MG/KG	MG/KG				
CAS #	Parameter	1919	1919				
9999900-02-4	Petroleum Hydrocarbons, TPH	2. U	2. U				

NSA MID-SOUTH
ASSEMBLY G & H CSI
SWMU 17

APX9-METAL	SAMPLE ID ------->	017-S-0001-15		017-S-0002-15		017-S-0003-15		017-C-0003-15		017-S-0004-15		017-S-0005-15	
	ORIGINAL ID ----->	017S000115		017S000215		017S000315		017C000315		017S000415		017S000515	
	LAB SAMPLE ID --->	S880103*5		S880069*9		S880049*9		S880049A*1		S880069*7		S880103*6	
	ID FROM REPORT -->	017S000115		017S000215		017S000315		017C000315		017S000415		017S000515	
	SAMPLE DATE ----->	01/07/98		01/06/98		01/05/98		01/05/98		01/06/98		01/07/98	
	DATE EXTRACTED -->	01/21/98		01/09/98		01/09/98		01/21/98		01/09/98		01/21/98	
	DATE ANALYZED --->	01/22/98		01/13/98		01/13/98		01/22/98		01/13/98		01/22/98	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ----------->	MG/KG		MG/KG		MG/KG		MG/KG		MG/KG		MG/KG	
CAS #	Parameter	EM1H06	VAL	EM1H03	VAL	EM1H03	VAL	EM1H04	VAL	EM1H03	VAL	EM1H06	VAL
7439-97-6	Mercury	0.03		0.02	J	0.02	J	0.02	J	0.02	J	0.02	
7440-36-0	Antimony	0.68	UR	0.42	UR	0.43	UR	0.78	UR	0.42	UR	1.3	UR
7440-38-2	Arsenic	8.1		4.7		2.6		1.8	J	7.2		2.4	J
7440-39-3	Barium	101.		60.5		48.9		45.6		60.7		48.5	
7440-41-7	Beryllium	0.45	J	0.29	U	0.31	U	0.32	U	0.34	U	0.39	J
7440-43-9	Cadmium	0.09	J	0.11	U	0.05	U	0.04	U	0.07	U	0.06	J
7440-47-3	Chromium	13.5	J	10.9	J	10.3	J	9.2		11.3	J	11.8	J
7440-48-4	Cobalt	7.1		6.		6.5		6.		5.6		6.1	
7440-50-8	Copper	17.3	J	12.9		13.8		13.7		12.5		14.8	J
7439-92-1	Lead	9.5	J	7.3	J	7.5	J	7.3	J	9.	J	7.9	J
7440-02-0	Nickel	17.6		13.9	J	14.5	J	14.1	J	13.2	J	14.7	
7782-49-2	Selenium	0.41	U	0.41	UJ	0.42	UJ	0.62	J	0.41	UJ	0.42	U
7440-22-4	Silver	0.12	U	0.12	U	0.12	U	0.12	U	0.12	U	0.12	U
7440-28-0	Thallium	0.76	UJ	0.75	UJ	0.77	UJ	0.77	U	0.75	UJ	0.77	UJ
7440-62-2	Vanadium	23.6		15.6		17.3		15.6		17.9		18.5	
7440-66-6	Zinc	51.3	J	35.6	J	36.4	J	37.2	J	41.5	J	48.3	J
7440-31-5	Tin	1.4	U	1.1	U	1.1	U	1.2	U	1.6	U	2.	U

*** Validation Complete ***

NSA MID-SOUTH
ASSEMBLY G & H CSI
SWMU 17

APX9-METAL

SAMPLE ID ------->	017-S-0006-15	017-S-0007-15	017-S-0008-15	017-S-0009-15
ORIGINAL ID ----->	017S000615	017S000715	017S000815	017S000915
LAB SAMPLE ID --->	S880103*8	S880049*10	S880069*8	S880103*7
ID FROM REPORT -->	017S000615	017S000715	017S000815	017S000915
SAMPLE DATE ----->	01/07/98	01/05/98	01/06/98	01/07/98
DATE EXTRACTED -->	01/21/98	01/09/98	01/09/98	01/21/98
DATE ANALYZED --->	01/22/98	01/13/98	01/13/98	01/22/98
MATRIX ---------->	Soil	Soil	Soil	Soil
UNITS ---------->	MG/KG	MG/KG	MG/KG	MG/KG

CAS #	Parameter	EM1H06	VAL	EM1H03	VAL	EM1H03	VAL	EM1H06	VAL
7439-97-6	Mercury	0.02		0.01	J	0.02	J	0.04	
7440-36-0	Antimony	0.42	UR	0.58	J	0.51	J	0.63	UR
7440-38-2	Arsenic	9.5		4.2		3.3		4.	J
7440-39-3	Barium	79.4		61.9		57.5		92.1	
7440-41-7	Beryllium	0.4	J	0.31	U	0.34	U	0.54	J
7440-43-9	Cadmium	0.04	UJ	0.04	U	0.21	U	0.21	J
7440-47-3	Chromium	13.	J	11.8	J	13.	J	16.3	J
7440-48-4	Cobalt	6.9		5.5		6.3		3.3	
7440-50-8	Copper	16.4	J	13.7		16.5		14.8	J
7439-92-1	Lead	8.4	J	8.1	J	8.8	J	8.1	J
7440-02-0	Nickel	18.6		13.9	J	16.3	J	16.	
7782-49-2	Selenium	0.41	U	0.41	UJ	0.43	UJ	0.4	U
7440-22-4	Silver	0.12	U	0.12	U	0.13	U	0.12	U
7440-28-0	Thallium	0.76	UJ	0.76	UJ	0.78	UJ	0.74	UJ
7440-62-2	Vanadium	22.1		17.4		19.9		17.9	
7440-66-6	Zinc	46.7	J	39.9	J	43.7	J	64.1	J
7440-31-5	Tin	0.7	U	1.4	U	1.1	U	0.55	U

*** Validation Complete ***

NSA MID-SOUTH
ASSEMBLY G & H CSI
SWMU 17

SW846-PEST													
	SAMPLE ID ------->	017-S-0001-15		017-S-0002-15		017-S-0003-15		017-C-0003-15		017-S-0004-15		017-S-0005-15	
	ORIGINAL ID ----->	017S000115		017S000215		017S000315		017C000315		017S000415		017S000515	
	LAB SAMPLE ID --->	S880103*5		S880069*9		S880049*9		S880049A*1		S880069*7		S880103*6	
	ID FROM REPORT -->	017S000115		017S000215		017S000315		017C000315		017S000415		017S000515	
	SAMPLE DATE ----->	01/07/98		01/06/98		01/05/98		01/05/98		01/06/98		01/07/98	
	DATE EXTRACTED -->	01/13/98		01/12/98		01/12/98		01/13/98		01/12/98		01/13/98	
	DATE ANALYZED --->	01/23/98		01/19/98		01/19/98		01/22/98		01/19/98		01/23/98	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	EM1H06	VAL	EM1H03	VAL	EM1H03	VAL	EM1H04	VAL	EM1H03	VAL	EM1H06	VAL
319-84-6	alpha-BHC	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U
319-85-7	beta-BHC	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U
319-86-8	delta-BHC	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U
58-89-9	gamma-BHC (Lindane)	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U
76-44-8	Heptachlor	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U
309-00-2	Aldrin	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U
1024-57-3	Heptachlor epoxide	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U
959-98-8	Endosulfan I	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U
60-57-1	Dieldrin	4.3	U	4.2	U	4.3	U	4.3	U	4.2	U	4.3	U
72-55-9	4,4'-DDE	4.3	U	4.2	U	4.3	U	4.3	U	4.2	U	4.3	U
72-20-8	Endrin	4.3	U	4.2	U	4.3	U	4.3	U	4.2	U	4.3	U
33213-65-9	Endosulfan II	4.3	U	4.2	U	4.3	U	4.3	U	4.2	U	4.3	U
72-54-8	4,4'-DDD	4.3	U	4.2	U	4.3	U	4.3	U	4.2	U	4.3	U
1031-07-8	Endosulfan sulfate	4.3	U	4.2	U	4.3	U	4.3	U	4.2	U	4.3	U
50-29-3	4,4'-DDT	4.3	U	4.2	U	4.3	U	4.3	U	4.2	U	4.3	U
72-43-5	Methoxychlor	22.	U	22.	U	22.	U	22.	U	22.	U	22.	U
7421-93-4	Endrin aldehyde	4.3	U	4.2	U	4.3	U	4.3	U	4.2	U	4.3	U
8001-35-2	Toxaphene	220.	U	220.	U	220.	U	220.	U	220.	U	220.	U
12674-11-2	Aroclor-1016	43.	U	42.	U	43.	U	43.	U	42.	U	43.	U
11104-28-2	Aroclor-1221	87.	U	86.	U	88.	U	88.	U	86.	U	88.	U
11141-16-5	Aroclor-1232	43.	U	42.	U	43.	U	43.	U	42.	U	43.	U
53469-21-9	Aroclor-1242	43.	U	42.	U	43.	U	43.	U	42.	U	43.	U
12672-29-6	Aroclor-1248	43.	U	42.	U	43.	U	43.	U	42.	U	43.	U
11097-69-1	Aroclor-1254	43.	U	42.	U	43.	U	43.	U	42.	U	43.	U
11096-82-5	Aroclor-1260	43.	U	42.	U	43.	U	43.	U	42.	U	43.	U
57-74-9	Chlordane	22.	U	22.	U	22.	U	22.	U	22.	U	22.	U

*** Validation Complete ***

NSA MID-SOUTH
ASSEMBLY G & H CSI
SWMU 17

SW846-PEST									
	SAMPLE ID ------->	017-S-0006-15		017-S-0007-15		017-S-0008-15		017-S-0009-15	
	ORIGINAL ID ----->	017S000615		017S000715		017S000815		017S000915	
	LAB SAMPLE ID --->	S880103*8		S880049*10		S880069*8		S880103*7	
	ID FROM REPORT -->	017S000615		017S000715		017S000815		017S000915	
	SAMPLE DATE ----->	01/07/98		01/05/98		01/06/98		01/07/98	
	DATE EXTRACTED -->	01/13/98		01/12/98		01/12/98		01/13/98	
	DATE ANALYZED --->	01/23/98		01/19/98		01/19/98		01/23/98	
	MATRIX ---------->	Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	EM1H06	VAL	EM1H03	VAL	EM1H03	VAL	EM1H06	VAL
319-84-6	alpha-BHC	2.2	U	0.75	U	2.3	U	2.2	U
319-85-7	beta-BHC	2.2	U	2.2	U	2.3	U	2.2	U
319-86-8	delta-BHC	2.2	U	2.2	U	2.3	U	2.2	U
58-89-9	gamma-BHC (Lindane)	2.2	U	2.2	U	2.3	U	2.2	U
76-44-8	Heptachlor	2.2	U	2.2	U	2.3	U	2.2	U
309-00-2	Aldrin	2.2	U	2.2	U	2.3	U	2.2	U
1024-57-3	Heptachlor epoxide	2.2	U	2.2	U	2.3	U	2.2	U
959-98-8	Endosulfan I	2.2	U	2.2	U	2.3	U	2.2	U
60-57-1	Dieldrin	4.3	U	4.3	U	4.4	U	4.2	U
72-55-9	4,4'-DDE	4.3	U	4.3	U	4.4	U	4.2	U
72-20-8	Endrin	4.3	U	4.3	U	4.4	U	4.2	U
33213-65-9	Endosulfan II	4.3	U	4.3	U	4.4	U	4.2	U
72-54-8	4,4'-DDD	4.3	U	4.3	U	4.4	U	4.2	U
1031-07-8	Endosulfan sulfate	4.3	U	4.3	U	4.4	U	4.2	U
50-29-3	4,4'-DDT	4.3	U	4.3	U	4.4	U	4.2	U
72-43-5	Methoxychlor	22.	U	22.	U	23.	U	22.	U
7421-93-4	Endrin aldehyde	4.3	U	4.3	U	4.4	U	4.2	U
8001-35-2	Toxaphene	220.	U	220.	U	230.	U	220.	U
12674-11-2	Aroclor-1016	43.	U	43.	U	44.	U	42.	U
11104-28-2	Aroclor-1221	87.	U	87.	U	89.	U	85.	U
11141-16-5	Aroclor-1232	43.	U	43.	U	44.	U	42.	U
53469-21-9	Aroclor-1242	43.	U	43.	U	44.	U	42.	U
12672-29-6	Aroclor-1248	43.	U	43.	U	44.	U	42.	U
11097-69-1	Aroclor-1254	43.	U	43.	U	44.	U	42.	U
11096-82-5	Aroclor-1260	43.	U	43.	U	44.	U	42.	U
57-74-9	Chlordane	22.	U	22.	U	23.	U	22.	U

*** Validation Complete ***

NSA MID-SOUTH
ASSEMBLY G & H CSI
SWMU 17

SW846-SVOA								
SAMPLE ID ------->	017-S-0001-15 RE	017-S-0002-15	017-S-0003-15	017-C-0003-15	017-S-0004-15	017-S-0005-15
ORIGINAL ID ----->	017S000115	017S000215	017S000315	017C000315	017S000415	017S000515
LAB SAMPLE ID --->	S880103*5*RE	S880069*9	S880049*9	S880049A*1	S880069*7	S880103*6
ID FROM REPORT -->	017S000115	017S000215	017S000315	017C000315	017S000415	017S000515
SAMPLE DATE ----->	01/07/98	01/06/98	01/05/98	01/05/98	01/06/98	01/07/98
DATE EXTRACTED -->	02/05/98	01/12/98	01/12/98	01/13/98	01/12/98	01/13/98
DATE ANALYZED --->	02/07/98	01/28/98	01/27/98	02/03/98	01/27/98	02/03/98
MATRIX ---------->	Soil	Soil	Soil	Soil	Soil	Soil
UNITS ---------->	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG

CAS #	Parameter	EM1H06	VAL	EM1H03	VAL	EM1H03	VAL	EM1H04	VAL	EM1H03	VAL	EM1H06	VAL
108-95-2	Phenol	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	U
111-44-4	bis(2-Chloroethyl)ether	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
95-57-8	2-Chlorophenol	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	U
541-73-1	1,3-Dichlorobenzene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
106-46-7	1,4-Dichlorobenzene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
95-50-1	1,2-Dichlorobenzene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
95-48-7	2-Methylphenol (o-Cresol)	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	U
108-60-1	2,2'-oxybis(1-Chloropropane)	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
9999900-32-2	3-Methylphenol/4-Methylphenol	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	U
621-64-7	N-Nitroso-di-n-propylamine	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
67-72-1	Hexachloroethane	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
98-95-3	Nitrobenzene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
78-59-1	Isophorone	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
88-75-5	2-Nitrophenol	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	U
105-67-9	2,4-Dimethylphenol	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	U
120-83-2	2,4-Dichlorophenol	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	U
120-82-1	1,2,4-Trichlorobenzene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
91-20-3	Naphthalene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
106-47-8	4-Chloroaniline	860.	UJ	850.	U	870.	U	870.	U	850.	U	870.	UJ
87-68-3	Hexachlorobutadiene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
111-91-1	bis(2-Chloroethoxy)methane	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
59-50-7	4-Chloro-3-methylphenol	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	U
91-57-6	2-Methylnaphthalene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
77-47-4	Hexachlorocyclopentadiene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
88-06-2	2,4,6-Trichlorophenol	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	U
95-95-4	2,4,5-Trichlorophenol	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	U
91-58-7	2-Chloronaphthalene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
88-74-4	2-Nitroaniline	2200.	UJ	2200.	U	2200.	U	2200.	U	2200.	U	2200.	UJ
131-11-3	Dimethylphthalate	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
208-96-8	Acenaphthylene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
606-20-2	2,6-Dinitrotoluene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
99-09-2	3-Nitroaniline	2200.	UJ	2200.	U	2200.	U	2200.	U	2200.	U	2200.	UJ
83-32-9	Acenaphthene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
51-28-5	2,4-Dinitrophenol	2200.	UJ	2200.	U	2200.	U	2200.	U	2200.	U	2200.	U
100-02-7	4-Nitrophenol	2200.	UJ	2200.	U	2200.	U	2200.	U	2200.	U	2200.	U
132-64-9	Dibenzofuran	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ

*** Validation Complete ***

NSA MID-SOUTH
ASSEMBLY G & H CSI
SWMU 17

SW846-SVOA													
	SAMPLE ID ------->	017-S-0001-15 RE		017-S-0002-15		017-S-0003-15		017-C-0003-15		017-S-0004-15		017-S-0005-15	
	ORIGINAL ID ----->	017S000115		017S000215		017S000315		017C000315		017S000415		017S000515	
	LAB SAMPLE ID --->	S880103*5*RE		S880069*9		S880049*9		S880049A*1		S880069*7		S880103*6	
	ID FROM REPORT -->	017S000115		017S000215		017S000315		017C000315		017S000415		017S000515	
	SAMPLE DATE ----->	01/07/98		01/06/98		01/05/98		01/05/98		01/06/98		01/07/98	
	DATE EXTRACTED -->	02/05/98		01/12/98		01/12/98		01/13/98		01/12/98		01/13/98	
	DATE ANALYZED --->	02/07/98		01/28/98		01/27/98		02/03/98		01/27/98		02/03/98	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	EM1H06	VAL	EM1H03	VAL	EM1H03	VAL	EM1H04	VAL	EM1H03	VAL	EM1H06	VAL
121-14-2	2,4-Dinitrotoluene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
84-66-2	Diethylphthalate	430.	UJ	420.	U	54.	J	430.	U	420.	U	430.	UJ
7005-72-3	4-Chlorophenylphenyl ether	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
86-73-7	Fluorene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
100-01-6	4-Nitroaniline	2200.	UJ	2200.	U	2200.	U	2200.	U	2200.	U	2200.	UJ
534-52-1	2-Methyl-4,6-Dinitrophenol	2200.	UJ	2200.	U	2200.	U	2200.	U	2200.	U	2200.	U
86-30-6	N-Nitrosodiphenylamine	NR		NR		NR		NR		NR		NR	
101-55-3	4-Bromophenyl-phenylether	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
118-74-1	Hexachlorobenzene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
87-86-5	Pentachlorophenol	2200.	UJ	2200.	U	2200.	U	2200.	U	2200.	U	2200.	U
85-01-8	Phenanthrene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
120-12-7	Anthracene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
86-74-8	Carbazole	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
84-74-2	Di-n-butylphthalate	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
206-44-0	Fluoranthene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
129-00-0	Pyrene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
85-68-7	Butylbenzylphthalate	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
91-94-1	3,3'-Dichlorobenzidine	860.	UJ	850.	U	870.	U	870.	U	850.	U	870.	UJ
56-55-3	Benzo(a)anthracene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
218-01-9	Chrysene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)	430.	UJ	420.	U	100.	J	81.	J	420.	U	160.	J
117-84-0	Di-n-octylphthalate	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
205-99-2	Benzo(b)fluoranthene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
207-08-9	Benzo(k)fluoranthene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
50-32-8	Benzo(a)pyrene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
193-39-5	Indeno(1,2,3-cd)pyrene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
53-70-3	Dibenz(a,h)anthracene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
191-24-2	Benzo(g,h,i)perylene	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ
122-39-4	Diphenylamine	430.	UJ	420.	U	430.	U	430.	U	420.	U	430.	UJ

*** Validation Complete ***

NSA MID-SOUTH
ASSEMBLY G & H CSI
SWMU 17

SW846-SVOA					
SAMPLE ID ------->	017-S-0006-15	017-S-0007-15	017-S-0008-15	017-S-0009-15 RE	
ORIGINAL ID ----->	017S000615	017S000715	017S000815	017S000915	
LAB SAMPLE ID --->	S880103*8	S880049*10	S880069*8	S880103*7*RE	
ID FROM REPORT -->	017S000615	017S000715	017S000815	017S000915	
SAMPLE DATE ----->	01/07/98	01/05/98	01/06/98	01/07/98	
DATE EXTRACTED -->	01/13/98	01/12/98	01/12/98	02/05/98	
DATE ANALYZED --->	02/03/98	01/27/98	01/28/98	02/07/98	
MATRIX ---------->	Soil	Soil	Soil	Soil	
UNITS ---------->	UG/KG	UG/KG	UG/KG	UG/KG	

CAS #	Parameter	EM1H06	VAL	EM1H03	VAL	EM1H03	VAL	EM1H06	VAL		
108-95-2	Phenol	430.	U	430.	U	440.	U	420.	UJ		
111-44-4	bis(2-Chloroethyl)ether	430.	U	430.	U	440.	U	420.	UJ		
95-57-8	2-Chlorophenol	430.	U	430.	U	440.	U	420.	UJ		
541-73-1	1,3-Dichlorobenzene	430.	U	430.	U	440.	U	420.	UJ		
106-46-7	1,4-Dichlorobenzene	430.	U	430.	U	440.	U	420.	UJ		
95-50-1	1,2-Dichlorobenzene	430.	U	430.	U	440.	U	420.	UJ		
95-48-7	2-Methylphenol (o-Cresol)	430.	U	430.	U	440.	U	420.	UJ		
108-60-1	2,2'-oxybis(1-Chloropropane)	430.	U	430.	U	440.	U	420.	UJ		
9999900-32-2	3-Methylphenol/4-Methylphenol	430.	U	430.	U	440.	U	420.	UJ		
621-64-7	N-Nitroso-di-n-propylamine	430.	U	430.	U	440.	U	420.	UJ		
67-72-1	Hexachloroethane	430.	U	430.	U	440.	U	420.	UJ		
98-95-3	Nitrobenzene	430.	U	430.	U	440.	U	420.	UJ		
78-59-1	Isophorone	430.	U	430.	U	440.	U	420.	UJ		
88-75-5	2-Nitrophenol	430.	U	430.	U	440.	U	420.	UJ		
105-67-9	2,4-Dimethylphenol	430.	U	430.	U	440.	U	420.	UJ		
120-83-2	2,4-Dichlorophenol	430.	U	430.	U	440.	U	420.	UJ		
120-82-1	1,2,4-Trichlorobenzene	430.	U	430.	U	440.	U	420.	UJ		
91-20-3	Naphthalene	430.	U	430.	U	440.	U	420.	UJ		
106-47-8	4-Chloroaniline	860.	U	860.	U	880.	U	840.	UJ		
87-68-3	Hexachlorobutadiene	430.	U	430.	U	440.	U	420.	UJ		
111-91-1	bis(2-Chloroethoxy)methane	430.	U	430.	U	440.	U	420.	UJ		
59-50-7	4-Chloro-3-methylphenol	430.	U	430.	U	440.	U	420.	UJ		
91-57-6	2-Methylnaphthalene	430.	U	430.	U	440.	U	420.	UJ		
77-47-4	Hexachlorocyclopentadiene	430.	U	430.	U	440.	U	420.	UJ		
88-06-2	2,4,6-Trichlorophenol	430.	U	430.	U	440.	U	420.	UJ		
95-95-4	2,4,5-Trichlorophenol	430.	U	430.	U	440.	U	420.	UJ		
91-58-7	2-Chloronaphthalene	430.	U	430.	U	440.	U	420.	UJ		
88-74-4	2-Nitroaniline	2200.	U	2200.	U	2300.	U	2200.	UJ		
131-11-3	Dimethylphthalate	430.	U	430.	U	440.	U	420.	UJ		
208-96-8	Acenaphthylene	430.	U	430.	U	440.	U	420.	UJ		
606-20-2	2,6-Dinitrotoluene	430.	U	430.	U	440.	U	420.	UJ		
99-09-2	3-Nitroaniline	2200.	U	2200.	U	2300.	U	2200.	UJ		
83-32-9	Acenaphthene	430.	U	430.	U	440.	U	420.	UJ		
51-28-5	2,4-Dinitrophenol	2200.	U	2200.	U	2300.	U	2200.	UJ		
100-02-7	4-Nitrophenol	2200.	U	2200.	U	2300.	U	2200.	UJ		
132-64-9	Dibenzofuran	430.	U	430.	U	440.	U	420.	UJ		

*** Validation Complete ***

NSA MID-SOUTH
ASSEMBLY G & H CSI
SWMU 17

SW846-SVOA					
SAMPLE ID ------->	017-S-0006-15	017-S-0007-15	017-S-0008-15	017-S-0009-15 RE	
ORIGINAL ID ----->	017S000615	017S000715	017S000815	017S000915	
LAB SAMPLE ID --->	S880103*8	S880049*10	S880069*8	S880103*7*RE	
ID FROM REPORT -->	017S000615	017S000715	017S000815	017S000915	
SAMPLE DATE ----->	01/07/98	01/05/98	01/06/98	01/07/98	
DATE EXTRACTED -->	01/13/98	01/12/98	01/12/98	02/05/98	
DATE ANALYZED --->	02/03/98	01/27/98	01/28/98	02/07/98	
MATRIX ---------->	Soil	Soil	Soil	Soil	
UNITS ---------->	UG/KG	UG/KG	UG/KG	UG/KG	

CAS #	Parameter	EM1H06	VAL	EM1H03	VAL	EM1H03	VAL	EM1H06	VAL
121-14-2	2,4-Dinitrotoluene	430.	U	430.	U	440.	U	420.	UJ
84-66-2	Diethylphthalate	430.	U	54.	J	440.	U	420.	UJ
7005-72-3	4-Chlorophenylphenyl ether	430.	U	430.	U	440.	U	420.	UJ
86-73-7	Fluorene	430.	U	430.	U	440.	U	420.	UJ
100-01-6	4-Nitroaniline	2200.	U	2200.	U	2300.	U	2200.	UJ
534-52-1	2-Methyl-4,6-Dinitrophenol	2200.	U	2200.	U	2300.	U	2200.	UJ
86-30-6	N-Nitrosodiphenylamine	NR		NR		NR		NR	
101-55-3	4-Bromophenyl-phenylether	430.	U	430.	U	440.	U	420.	UJ
118-74-1	Hexachlorobenzene	430.	U	430.	U	440.	U	420.	UJ
87-86-5	Pentachlorophenol	2200.	U	2200.	U	2300.	U	2200.	UJ
85-01-8	Phenanthrene	430.	U	430.	U	440.	U	420.	UJ
120-12-7	Anthracene	430.	U	430.	U	440.	U	420.	UJ
86-74-8	Carbazole	430.	U	430.	U	440.	U	420.	UJ
84-74-2	Di-n-butylphthalate	430.	U	430.	U	440.	U	420.	UJ
206-44-0	Fluoranthene	430.	U	430.	U	440.	U	420.	UJ
129-00-0	Pyrene	430.	U	430.	U	440.	U	420.	UJ
85-68-7	Butylbenzylphthalate	430.	U	430.	U	440.	U	420.	UJ
91-94-1	3,3'-Dichlorobenzidine	860.	U	860.	U	880.	U	840.	UJ
56-55-3	Benzo(a)anthracene	430.	U	430.	U	440.	U	420.	UJ
218-01-9	Chrysene	430.	U	430.	U	440.	U	420.	UJ
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)	430.	U	430.	U	440.	U	420.	UJ
117-84-0	Di-n-octylphthalate	430.	U	430.	U	440.	U	420.	UJ
205-99-2	Benzo(b)fluoranthene	430.	U	430.	U	440.	U	420.	UJ
207-08-9	Benzo(k)fluoranthene	430.	U	430.	U	440.	U	420.	UJ
50-32-8	Benzo(a)pyrene	430.	U	430.	U	440.	U	420.	UJ
193-39-5	Indeno(1,2,3-cd)pyrene	430.	U	430.	U	440.	U	420.	UJ
53-70-3	Dibenz(a,h)anthracene	430.	U	430.	U	440.	U	420.	UJ
191-24-2	Benzo(g,h,i)perylene	430.	U	430.	U	440.	U	420.	UJ
122-39-4	Diphenylamine	430.	U	430.	U	440.	U	420.	UJ

*** Validation Complete ***

NSA MID-SOUTH
ASSEMBLY G & H CSI
SWMU 17

SW846-VOA	SAMPLE ID ------->	017-S-0001-15	017-G-0001-49	017-H-0001-49	017-S-0002-15	017-G-0002-48	017-S-0003-15
	ORIGINAL ID ----->	017S000115	017G000149	017H000149	017S000215	017G000248	017S000315
	LAB SAMPLE ID --->	S880103*5	S880103B*3	S880103C*1	S880069*9	S8800698*1	S880049*9
	ID FROM REPORT -->	017S000115	017G000149	017H000149	017S000215	017G000248	017S000315
	SAMPLE DATE ----->	01/07/98	01/07/98	01/07/98	01/06/98	01/06/98	01/05/98
	DATE ANALYZED --->	01/16/98	01/12/98	01/14/98	01/08/98	01/12/98	01/08/98
	MATRIX ---------->	Soil	Water	Water	Soil	Water	Soil
	UNITS ---------->	UG/KG	UG/L	UG/L	UG/KG	UG/L	UG/KG

CAS #	Parameter	EM1H06	VAL	EM1H05	VAL	EM1H07	VAL	EM1H03	VAL	EM1H05	VAL	EM1H03	VAL
74-87-3	Chloromethane	13.	U	10.	U	10.	UJ	13.	U	10.	U	13.	U
75-01-4	Vinyl chloride	13.	U	10.	U	10.	U	13.	U	10.	U	13.	U
74-83-9	Bromomethane	13.	U	10.	UJ	10.	U	13.	U	10.	UJ	13.	U
75-00-3	Chloroethane	13.	U	10.	U	10.	U	13.	U	10.	U	13.	U
75-35-4	1,1-Dichloroethene	6.5	U	5.	U	5.	U	6.4	U	5.	U	6.6	U
75-09-2	Methylene chloride	6.5	U	5.	U	5.	U	6.4	U	5.	U	6.6	U
75-34-3	1,1-Dichloroethane	6.5	U	5.	U	5.	U	6.4	U	5.	U	6.6	U
67-66-3	Chloroform	6.5	U	5.	U	5.	U	6.4	U	5.	U	6.6	U
71-55-6	1,1,1-Trichloroethane	6.5	U	5.	U	5.	U	6.4	U	5.	U	6.6	U
56-23-5	Carbon tetrachloride	6.5	U	5.	U	5.	U	6.4	U	5.	U	6.6	U
71-43-2	Benzene	6.5	U	5.	U	5.	U	3.3	J	5.	U	2.3	J
107-06-2	1,2-Dichloroethane	6.5	U	5.	U	5.	U	6.4	U	5.	U	6.6	U
79-01-6	Trichloroethene	6.5	U	5.	U	5.	U	6.4	U	5.	U	6.6	U
78-87-5	1,2-Dichloropropane	6.5	U	5.	U	5.	U	6.4	U	5.	U	6.6	U
75-27-4	Bromodichloromethane	6.5	U	5.	U	5.	U	6.4	U	5.	U	6.6	U
108-88-3	Toluene	6.5	U	5.	U	5.	U	6.4	U	11.	U	6.6	U
79-00-5	1,1,2-Trichloroethane	6.5	U	5.	U	5.	U	6.4	U	5.	U	6.6	U
127-18-4	Tetrachloroethene	6.5	U	5.	U	5.	U	6.4	U	5.	U	1.6	J
124-48-1	Dibromochloromethane	6.5	U	5.	U	5.	U	6.4	U	5.	U	6.6	U
108-90-7	Chlorobenzene	6.5	U	5.	U	5.	U	6.4	U	5.	U	6.6	U
100-41-4	Ethylbenzene	6.5	U	5.	U	5.	U	6.4	U	5.	U	6.6	U
100-42-5	Styrene	6.5	U	5.	U	5.	U	6.4	U	5.	U	6.6	U
75-25-2	Bromoform	6.5	U	5.	U	5.	U	6.4	U	5.	U	6.6	U
79-34-5	1,1,2,2-Tetrachloroethane	6.5	U	5.	U	5.	U	6.4	U	5.	U	6.6	U
67-64-1	Acetone	65.	U	50.	U	50.	U	15.	J	50.	U	38.	J
75-15-0	Carbon disulfide	6.5	U	5.	U	5.	U	6.4	U	5.	U	6.6	U
78-93-3	2-Butanone (MEK)	32.	U	25.	U	25.	U	32.	U	25.	U	33.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	32.	U	25.	U	25.	U	32.	U	25.	U	33.	U
10061-01-5	cis-1,3-Dichloropropene	6.5	U	5.	U	5.	U	6.4	U	5.	U	6.6	U
10061-02-6	trans-1,3-Dichloropropene	6.5	U	5.	U	5.	U	6.4	U	5.	U	6.6	U
591-78-6	2-Hexanone	32.	U	25.	U	25.	U	32.	U	25.	U	33.	U
1330-20-7	Xylene (Total)	6.5	U	5.	U	5.	U	6.4	U	5.	U	2.	J
540-59-0	1,2-Dichloroethene (total)	6.5	U	5.	U	5.	U	6.4	U	5.	U	6.6	U
1330-20-7	Xylene (Total)	NR		NR		NR		NR		NR		NR	
9999000-44-2	XYLENES	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
ASSEMBLY G & H CSI
SWMU 17

SW846-VOA													
	SAMPLE ID ------->	017-C-0003-15		017-S-0004-15		017-S-0005-15		017-G-0005-49		017-S-0006-15		017-G-0006-49	
	ORIGINAL ID ----->	017C000315		017S000415		017S000515		017G000549		017S000615		017G000649	
	LAB SAMPLE ID --->	S880049A*1		S880069*7		S880103*6		S8801038*4		S880103*8		S8801038*1	
	ID FROM REPORT -->	017C000315		017S000415		017S000515		017G000549		017S000615		017G000649	
	SAMPLE DATE ----->	01/05/98		01/06/98		01/07/98		01/07/98		01/07/98		01/07/98	
	DATE ANALYZED --->	01/15/98		01/08/98		01/16/98		01/12/98		01/16/98		01/12/98	
	MATRIX ---------->	Soil		Soil		Soil		Water		Soil		Water	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/L		UG/KG		UG/L	
CAS #	Parameter	EM1H04	VAL	EM1H03	VAL	EM1H06	VAL	EM1H05	VAL	EM1H06	VAL	EM1H05	VAL
74-87-3	Chloromethane	13.	U	13.	U	13.	U	10.	U	13.	U	10.	U
75-01-4	Vinyl chloride	13.	U	13.	U	13.	U	10.	U	13.	U	10.	U
74-83-9	Bromomethane	13.	U	13.	U	13.	U	10.	UJ	13.	U	10.	UJ
75-00-3	Chloroethane	13.	U	13.	U	13.	U	10.	U	13.	U	10.	U
75-35-4	1,1-Dichloroethene	6.6	U	6.4	U	6.6	U	5.	U	6.5	U	5.	U
75-09-2	Methylene chloride	6.6	U	6.4	U	6.6	U	5.	U	6.5	U	5.	U
75-34-3	1,1-Dichloroethane	6.6	U	6.4	U	6.6	U	5.	U	6.5	U	5.	U
67-66-3	Chloroform	6.6	U	6.4	U	6.6	U	5.	U	6.5	U	5.	U
71-55-6	1,1,1-Trichloroethane	6.6	U	6.4	U	6.6	U	5.	U	6.5	U	5.7	
56-23-5	Carbon tetrachloride	6.6	U	6.4	U	6.6	U	5.	U	6.5	U	5.	U
71-43-2	Benzene	6.6	U	6.4	U	6.6	U	5.	U	6.5	U	5.	U
107-06-2	1,2-Dichloroethane	6.6	U	6.4	U	6.6	U	5.	U	6.5	U	5.	U
79-01-6	Trichloroethene	6.6	U	6.4	U	6.6	U	5.	U	6.5	U	5.	U
78-87-5	1,2-Dichloropropane	6.6	U	6.4	U	6.6	U	28.		6.5	U	5.	U
75-27-4	Bromodichloromethane	6.6	U	6.4	U	6.6	U	5.	U	6.5	U	5.	U
108-88-3	Toluene	6.6	U	6.4	U	6.6	U	5.	U	6.5	U	5.	U
79-00-5	1,1,2-Trichloroethane	6.6	U	6.4	U	6.6	U	5.	U	6.5	U	5.	U
127-18-4	Tetrachloroethene	6.6	U	6.4	U	6.6	U	5.	U	6.5	U	5.	U
124-48-1	Dibromochloromethane	6.6	U	6.4	U	6.6	U	5.	U	6.5	U	5.	U
108-90-7	Chlorobenzene	6.6	U	6.4	U	6.6	U	5.	U	6.5	U	5.	U
100-41-4	Ethylbenzene	6.6	U	6.4	U	6.6	U	5.	U	6.5	U	5.	U
100-42-5	Styrene	6.6	U	6.4	U	6.6	U	5.	U	6.5	U	5.	U
75-25-2	Bromoform	6.6	U	6.4	U	6.6	U	5.	U	6.5	U	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	6.6	U	6.4	U	6.6	U	5.	U	6.5	U	5.	U
67-64-1	Acetone	66.	U	26.	J	66.	U	50.	U	65.	U	50.	U
75-15-0	Carbon disulfide	6.6	U	6.4	U	6.6	U	5.	U	6.5	U	5.	U
78-93-3	2-Butanone (MEK)	33.	U	32.	U	33.	U	25.	U	32.	U	25.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	33.	U	32.	U	33.	U	25.	U	32.	U	25.	U
10061-01-5	cis-1,3-Dichloropropene	6.6	U	6.4	U	6.6	U	5.	U	6.5	U	5.	U
10061-02-6	trans-1,3-Dichloropropene	6.6	U	6.4	U	6.6	U	5.	U	6.5	U	5.	U
591-78-6	2-Hexanone	33.	U	32.	U	33.	U	25.	U	32.	U	25.	U
1330-20-7	Xylene (Total)	6.6	U	6.4	U	6.6	U	5.	U	6.5	U	5.	U
540-59-0	1,2-Dichloroethene (total)	6.6	U	6.4	U	6.6	U	5.	U	6.5	U	5.	U
1330-20-7	Xylene (Total)	NR		NR		NR		NR		NR		NR	
9999000-44-2	XYLENES	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
ASSEMBLY G & H CSI
SWMU 17

SW846-VOA	SAMPLE ID ------>	017-S-0007-15		017-S-0008-15		017-S-0009-15		017-G-0009-48	
	ORIGINAL ID ----->	017S000715		017S000815		017S000915		017G000948	
	LAB SAMPLE ID --->	S880049*10		S880069*8		S880103*7		S880103B*5	
	ID FROM REPORT -->	017S000715		017S000815		017S000915		017G000948	
	SAMPLE DATE ----->	01/05/98		01/06/98		01/07/98		01/07/98	
	DATE ANALYZED --->	01/08/98		01/08/98		01/16/98		01/12/98	
	MATRIX ---------->	Soil		Soil		Soil		Water	
	UNITS ----------->	UG/KG		UG/KG		UG/KG		UG/L	

CAS #	Parameter	EM1H03	VAL	EM1H03	VAL	EM1H06	VAL	EM1H05	VAL
74-87-3	Chloromethane	13.	U	13.	U	13.	U	10.	U
75-01-4	Vinyl chloride	13.	U	13.	U	13.	U	10.	U
74-83-9	Bromomethane	13.	U	13.	U	13.	U	10.	UJ
75-00-3	Chloroethane	13.	U	13.	U	13.	U	10.	U
75-35-4	1,1-Dichloroethene	6.5	U	6.7	U	6.3	U	5.	U
75-09-2	Methylene chloride	6.5	U	6.7	U	6.3	U	5.	U
75-34-3	1,1-Dichloroethane	6.5	U	6.7	U	6.3	U	5.	U
67-66-3	Chloroform	6.5	U	6.7	U	6.3	U	5.	U
71-55-6	1,1,1-Trichloroethane	6.5	U	6.7	U	6.3	U	5.	U
56-23-5	Carbon tetrachloride	6.5	U	6.7	U	6.3	U	5.	U
71-43-2	Benzene	6.5	U	2.5	J	6.3	U	1.1	J
107-06-2	1,2-Dichloroethane	6.5	U	6.7	U	6.3	U	5.	U
79-01-6	Trichloroethene	6.5	U	6.7	U	6.3	U	5.	U
78-87-5	1,2-Dichloropropane	6.5	U	6.7	U	6.3	U	5.	U
75-27-4	Bromodichloromethane	6.5	U	6.7	U	6.3	U	5.	U
108-88-3	Toluene	6.5	U	6.7	U	6.3	U	5.	U
79-00-5	1,1,2-Trichloroethane	6.5	U	6.7	U	6.3	U	5.	U
127-18-4	Tetrachloroethene	6.5	U	6.7	U	6.3	U	5.	U
124-48-1	Dibromochloromethane	6.5	U	6.7	U	6.3	U	5.	U
108-90-7	Chlorobenzene	6.5	U	6.7	U	6.3	U	5.	U
100-41-4	Ethylbenzene	6.5	U	6.7	U	6.3	U	5.	U
100-42-5	Styrene	6.5	U	6.7	U	6.3	U	5.	U
75-25-2	Bromoform	6.5	U	6.7	U	6.3	U	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	6.5	U	6.7	U	6.3	U	5.	U
67-64-1	Acetone	22.	J	50.	J	63.	U	50.	U
75-15-0	Carbon disulfide	6.5	U	6.7	U	6.3	U	5.	U
78-93-3	2-Butanone (MEK)	32.	U	33.	U	32.	U	25.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	32.	U	33.	U	32.	U	25.	U
10061-01-5	cis-1,3-Dichloropropene	6.5	U	6.7	U	6.3	U	5.	U
10061-02-6	trans-1,3-Dichloropropene	6.5	U	6.7	U	6.3	U	5.	U
591-78-6	2-Hexanone	32.	U	33.	U	32.	U	25.	U
1330-20-7	Xylene (Total)	6.5	U	6.7	U	6.3	U	5.	U
540-59-0	1,2-Dichloroethene (total)	6.5	U	6.7	U	6.3	U	5.	U
1330-20-7	Xylene (Total)	NR		NR		NR		NR	
9999000-44-2	XYLENES	NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
ASSEMBLY G & H CSI
SWMU 17

TPH							
SAMPLE ID ------>	017-S-0001-15	017-S-0002-15	017-S-0003-15	017-C-0003-15	017-S-0004-15	017-S-0005-15
ORIGINAL ID ----->	017S000115	017S000215	017S000315	017C000315	017S000415	017S000515
LAB SAMPLE ID --->	S880103*5	S880069*9	S880049*9	S880049A*1	S880069*7	S880103*6
ID FROM REPORT -->	017S000115	017S000215	017S000315	017C000315	017S000415	017S000515
SAMPLE DATE ----->	01/07/98	01/06/98	01/05/98	01/05/98	01/06/98	01/07/98
DATE EXTRACTED -->	02/04/98	01/14/98	01/14/98	01/29/98	01/14/98	02/04/98
DATE ANALYZED --->	02/05/98	01/14/98	01/14/98	01/29/98	01/14/98	02/05/98
MATRIX ---------->	Soil	Soil	Soil	Soil	Soil	Soil
UNITS ----------->	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG

CAS #	Parameter	EM1H06	VAL	EM1H03	VAL	EM1H03	VAL	EM1H04	VAL	EM1H03	VAL	EM1H06	VAL
9999900-02-4	Petroleum Hydrocarbons, TPH	NR		NR		NR		NR		NR		NR	
9999000-83-9	TOTAL RECOVERABLE PETROLEUM HYDROCARBONS	160.	J	120.	J	130.	J	13.	UJ	66.	J	13.	UJ

*** Validation Complete ***

NSA MID-SOUTH
ASSEMBLY G & H CSI
SWMU 17

TPH

SAMPLE ID ------->	017-S-0006-15	017-S-0007-15	017-S-0008-15	017-S-0009-15		
ORIGINAL ID ----->	017S000615	017S000715	017S000815	017S000915		
LAB SAMPLE ID --->	S880103*8	S880049*10	S880069*8	S880103*7		
ID FROM REPORT -->	017S000615	017S000715	017S000815	017S000915		
SAMPLE DATE ----->	01/07/98	01/05/98	01/06/98	01/07/98		
DATE EXTRACTED -->	02/04/98	01/14/98	01/14/98	02/04/98		
DATE ANALYZED --->	02/05/98	01/14/98	01/14/98	02/05/98		
MATRIX ---------->	Soil	Soil	Soil	Soil		
UNITS ----------->	MG/KG	MG/KG	MG/KG	MG/KG		

CAS #	Parameter	EM1H06	VAL	EM1H03	VAL	EM1H03	VAL	EM1H06	VAL		
9999900-02-4	Petroleum Hydrocarbons, TPH	NR		NR		NR		NR			
9999000-83-9	TOTAL RECOVERABLE PETROLEUM HYDROCARBONS	13.	UJ	320.	J	160.	J	13.	UJ		

*** Validation Complete ***

Appendix D

Comprehensive Health and Safety Plan

7.0 COMPREHENSIVE HEALTH AND SAFETY PLAN (CHASP)

A Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) is being conducted at the Naval Air Station (NAS) Memphis, Tennessee. The purpose of this program is to assess the nature and extent of contamination at the site and to determine if follow-up action is required to maintain compliance with environmental regulations.

This Comprehensive Health and Safety Plan (CHASP) is applicable to field operations to be conducted during the RFI at NAS Memphis. The Navy project contract number with EnSafe/Allen & Hoshall (E/A&H) is N62467-89-D-0318. A Site-Specific Health and Safety Plan (SSHSP) will be developed and implemented to address site-specific activities and hazards.

The provisions of this plan are mandatory for E/A&H personnel and those personnel under contract to E/A&H or the Navy e.g., the United States Geological Survey (USGS) whose work responsibilities call for them to enter a work zone (See 7.3 Work Areas). Such personnel must read this plan and sign the plan acceptance form (See Attachment C) before starting site activities. In addition, such personnel will operate in accordance with the most current requirements of 29 CFR 1910.120, *Standards for Hazardous Waste Workers and Emergency Responders* (HAZWOPER). These regulations include the following provisions for employees exposed to hazardous substances, health hazards, or safety hazards: training as described in 120(e), medical surveillance as described in 120(f), and personal protective equipment (PPE) described in 120(g).

All non-E/A&H personnel present in E/A&H work areas shall either adopt and abide by this CHASP and the corresponding SSHSP or shall have their own safety plan which, at a minimum, meets the requirements of the E/A&H CHASP and SSHSP.

At least one person certified in CPR and First Aid will be present during field activities. In addition, the E/A&H employees that are onsite will be certified in CPR and First Aid.

7.1 Site Characterization

Upon review of available information, the following chemicals are representative of the types of chemical hazards (contamination) known or suspected to be present on NAS Memphis: benzene, toluene, ethylbenzene, xylene, polychlorinated biphenyls (PCBs), naphtha, waste oils, and cleaning solutions. SSHSPs shall be designed to protect workers from chemical hazards known or suspected to be present at a specific location. The following information will be included in the SSHSP:

- A site map displaying the location of planned work areas within the site
- The expected site-specific contaminants of concern and the (suspected) magnitude and scope of the situation
- Decontamination procedures
- A material safety data sheet (MSDS) for each contaminant known or expected of being present

7.1.1 Work Areas

Site control for all work areas will be established and maintained according to the recommendations in the EPA's *Interim Standard Operating Safety Guides*, Revised September, 1982. Three general zones of operation, each described below, will be established to reduce the potential for contaminant migration and risk of personnel exposure:

- The exclusion zone (EZ) or "hot zone"

- contamination reduction zone (CRZ), and the
- support zone (SZ)

Field personnel shall enter the SZ and don their PPE, then they will move through the CRZ and into the EZ. After completing their work or when taking a break they will leave the EZ through the CRZ, decontaminate themselves and their equipment, and leave the area through the SZ.

The exclusion zone is the area being investigated, sampled, or otherwise of interest. It is where chemical contamination is known or suspected to exist. The EZ includes the work area except for areas set aside as either the CRZ or SZ. The EZ will be defined and demarcated in the field; in the case of drilling, the EZ is typically about 50 feet in diameter with the borehole located in the middle.

Only authorized personnel that meet the training requirements of OSHA 29 CFR 1910.120 (40 hour HAZWOPER course/8-hour annual refresher course/24-hour supervised onsite training or equivalent) are permitted within the exclusion and contamination reduction zones. Documentation of these certifications will be maintained on site, as well as in the site trailer, at all times. Prior to entering the EZ, and at all times when in the EZ, all personnel shall be outfitted in and properly use all required PPE. A checkpoint may be established at the edge of the EZ to regulate the flow of personnel and equipment in and out of the area.

When using Level A, B, or C PPE, all personnel entering the EZ must use the "buddy system". All persons entering the EZ must be able to:

- Provide his or her partner with assistance
- Observe his or her partner for signs of chemical or heat exposure
- Periodically check the integrity of his or her partner's protective clothing
- Notify the shift supervisor, his representative, or others if emergency help is needed

Additionally, at least one person shall remain outside the EZ and have available at least the same level of PPE as those who entered the EZ. The person outside the EZ will provide logistical and safety support as needed.

The contamination reduction zone serves as a buffer between the EZ and the SZ and is intended to prevent the spread of contaminants from the work areas. All decontamination procedures will be conducted in this area. The CRZ shall be adjacent to and upwind of the EZ and include all decontamination stations. When leaving the SZ and entering the CRZ, personnel must be wearing the prescribed PPE. Exiting the CRZ requires the removal of all contaminants through compliance with established decontamination procedures as contained herein and in the corresponding SSHSP.

The support zone is the outermost area and is considered a non-contaminated or clean area. The support area will be equipped with an appropriate first-aid station and equipment to perform gross decontamination of health and safety equipment (e.g., air monitoring equipment). The SZ is adjacent to and upwind of the CRZ.

The actual location and boundary of work zones will be determined and demarcated in the field. Existing site conditions such as prevailing wind direction, location of utilities, roads, security, etc., shall be considered when determining zone locations.

Changes in meteorologic conditions or site conditions may necessitate relocating the CRZ or SZ. These conditions (e.g., wind direction, surface water run-off patterns, etc.) will be monitored at all times. A wind sock or similar device will be placed in a location visible to all site workers.

7.1.2 Work Area Access

A file will be maintained onsite that includes a current OSHA initial HAZWOPER training certificate (or copy) and an up-to-date refresher certificate for all employees involved in field activities. Employees that are unsure that a copy of their certificate is onsite shall bring a copy of their certificate with them and present it to the Site Health and Safety Officer before beginning field work. Personnel that fail to meet or abide by the criteria established in the CHASP or SSHSP shall be restricted from entering work areas.

Subcontractors, DOD oversight personnel, and other site visitors must provide the Site Health and Safety Officer with documentation showing that their HAZWOPER training is current and must agree to comply with this CHASP and the corresponding SSHSP or equivalent health and safety requirements prior to site entry. Personnel that fail to meet or abide by the criteria established in the CHASP or SSHSP shall be restricted from entering work areas.

The Site Health and Safety Officer may suspend site work and may instruct personnel to evacuate the area. Examples of situations when this may happen are:

- Site conditions have changed, for whatever reason, such that the SSHSP does not adequately address the current situation,
- Safety precautions being used are inadequate for the situation, or
- Personnel including E/A&H, subcontractors, visitors, or DOD are or may be exposed to an immediate health hazard.

7.1.3 Site History and Description

A review of the existing site data will be conducted to assess the potential hazards to be encountered by E/A&H and contractor personnel and addressed in the SSHSP. The location of NAS Memphis is shown on Figure 2-1, Vicinity Map.

7.2 Site Activities

Field activities to be conducted as part of this RFI (e.g., soil borings, well installations, and well development) are described in the E/A&H Comprehensive Sampling and Analysis Plan (CSAP). Specific health and safety procedures associated with specific activities, hazards, and/or sites are addressed in the appropriate SSHSP.

The Site Supervisor will manage the day-to-day field operations which includes assigning field staff to specific work tasks and coordinating any required logistical support. The Site Supervisor has the authority to suspend or postpone specific field operations if he or she believes that worker health and safety concerns have not been adequately addressed.

Certain activities present a level of hazard that must be dealt with on a case by case basis. These activities are neither covered by this CHASP nor by a SSHSP. Examples of such activities are: confined space entry; moving or sampling of unknown drums or containers; and entering excavations, trenches, or test pits that are more than three feet deep. Should the Project Manager or Site Supervisor deem it necessary to perform an activity such as those listed above, it is that person's responsibility to contact the Project Health and Safety Officer and request an addendum to the SSHSP specifying the health and safety procedures, training, and conditions necessary for undertaking that task. These activities are prohibited until the SSHSP addendum is reviewed, accepted, and implemented.

7.3 Chemical Hazards

Information about specific site chemical hazards will be provided in each SSHSP. Such information will include National Fire Protection Association (NFPA) ratings, symptoms of acute and chronic exposure, carcinogenicity, and OSHA permissible exposure limits (PELs). A table of exposure guidelines for expected site chemicals will be provided. Information in this table will include odor thresholds, OSHA PELs, American Conference of Governmental Industrial Hygienists threshold limit values (ACGIH TLVs), National Institute for Occupational Safety and

Health recommended exposure limits (NIOSH RELs), auto-ignition temperatures, and flammability ranges. Material Safety Data Sheets for these materials will be included in Attachment A of each SIP.

7.4 Operations and Physical Hazards

Field personnel should be aware of and act in a manner to minimize the dangers associated with physical hazards typically encountered during environmental investigations. These hazards include heat-related illnesses, uneven terrain, slippery surfaces, lifting, and use of heavy equipment. Electrical lines may be present either above or below ground, and underground gas lines may be present. Prior to the initiation of drilling activities, drilling locations must be cleared by the Naval Public Works Center (PWC).

Heavy equipment and drill rig operations will be conducted in accordance with the procedures outlined in Attachment A — *Drilling Safety Guide*, provided in this plan. Personnel conducting drill rig operations shall keep clear of all moving parts. To prevent entanglement with the drill rig, loose clothing shall not be worn. The Site Supervisor and Site Health and Safety Officer shall be aware of the potential for heat stress and other weather-related illnesses, and shall implement appropriate work regimens to minimize the likelihood of field personnel becoming ill. When conducting operations or survey work on foot, personnel will walk at all times. Running greatly increases the probability of slipping, tripping, and falling. When working in areas that support habitat for poisonous snakes, personnel shall wear protective chaps made of a heavy material designed to prevent snake bites to the legs.

7.5 Employee protection

Employee protection for this project includes standard safe work practices, NAS Memphis rules of conduct, PPE, personal decontamination procedures, equipment for extreme weather conditions, work limitations, and exposure evaluation.

7.5.1 Standard Safe Work Practices:

- Eating, drinking, chewing gum or tobacco, smoking, or any activity that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in any area designated as contaminated, unless authorized by the Site Health and Safety Officer.

- Hands and face must be thoroughly washed upon leaving the work area.

- No contact lenses will be worn in work areas while invasive actions are conducted.

- Whenever decontamination procedures for outer garments are in effect, the entire body should be thoroughly washed as soon as possible after the protective garment is removed.

- Contact with contaminated or suspected contaminated surfaces should be avoided. Whenever possible, do not walk through puddles, leachate, or discolored surfaces, or lean, sit, or place equipment on drums, containers, or on soil suspected of being contaminated.

- Medicine and alcohol can exacerbate the effects from exposure to toxic chemicals. Prescribed drugs should not be taken by personnel on cleanup or response operations where the potential for absorption, inhalation, or ingestion of toxic substances exists unless specifically approved by a qualified physician. Consumption of alcoholic beverages is prohibited.

- Due to the possible presence of overhead power lines, adequate side and overhead clearance should be maintained to ensure that the drill rig boom does not touch or pass close to any overhead lines.

- Due to the possible presence of underground utilities (including electric, natural gas, water, sewer, telephone, etc.), the activity and local utility representatives should be contacted and requested to identify all lines at the ground surface using characteristic spray paint or labeled stakes. A 3-yard buffer zone should be maintained during all subsurface investigations.

- Due to the flammable properties of some of the potential chemical hazards, all spark or ignition sources should be bonded and/or grounded or mitigated before soil boring advancement or other site activities begin.

7.5.2 NAS Memphis General Rules of Conduct:

- Liquor, firearms, narcotics, tape recorders, and other contraband items are not permitted on the premises.

- Any violation of local, state, or federal laws, or conduct which is outside the generally accepted moral standards of the community is prohibited.

- Violation of the Espionage Act, willfully hindering or limiting production, or sabotage is not permitted.

- Willfully damaging or destroying property or removing government records is forbidden.

- Misappropriation or unauthorized altering of any government records is forbidden.

- Securing government tools in a personal or contractor's tool box is forbidden.

- Gambling in any form, selling tickets or articles, taking orders, soliciting subscriptions, taking up collections, etc., is forbidden.

- Doing personal work in government shop or office, using government property or material for unauthorized purposes, or using government telephones for unnecessary or unauthorized local or long distance telephone calls is forbidden.

- Compliance with posted signs and notices is required.

- Boisterousness and noisy or offensive work habits, abusive language, or any verbal, written, symbolic, or other communicative expression which tends to disrupt the work or morale of others is forbidden.

- Fighting or threatening bodily harm to another is forbidden.

- Defacing any government property is forbidden.

- Wearing shorts of any type and/or offensive logos, pictures, or phrases on clothing is forbidden. Shirts, shoes, and pants or slacks or coverall-type garments will be worn at all times on government property.

- All persons operating motor vehicles will obey all NAS Memphis traffic regulations.

7.5.3 Selection of Personal Protective Equipment

It is important that PPE be appropriate to protect against the potential or known hazards at each cleanup or investigation site. Protective equipment will be selected based on the types, concentrations, and routes of personal exposure that may be encountered. In situations where the types of materials and possibilities of contact are unknown or the hazards are not clearly identifiable, a more subjective determination must be made of the PPE required, based on past experiences and sound safety practices.

Table 7-1
Level of Protection and Criteria

Level of Protection	Criteria for Use	Equipment
Level A	• When atmospheres are "immediately dangerous to life and health" (IDLH in the NIOSH/OSHA Pocket Guide to Chemical Hazards or other guides.) • When known atmospheres or potential situations exist that would effect the skin or eyes or be absorbed into the body through these surfaces. Consult standard references to obtain concentrations hazardous to skin, eyes, or mucous membranes. • Potential situations include those where immersion may occur, vapors may be generated, or splashing may occur through site activities. • Where atmospheres are oxygen deficient. • When the type(s) and or potential concentration of toxic substances are not known.	• Positive-pressure full facepiece self-contained breathing apparatus (SCBA) or positive-pressure supplied air respirator with escape SCBA. • Fully-encapsulating chemical protective suit. • Chemical-resistant inner and outer gloves. • Steel toe and shank chemical resistant boots. • Hard hat under suit. • Two-way radios worn inside suit. • Optional: coveralls, long cotton underwear, disposable protective suit, gloves and boots, over fully encapsulating suit.
Level B	• When respiratory protection is warranted and cartridge respirators are not appropriate. Examples of these conditions are: When work areas contain less than 19.5 percent oxygen. When expected contaminants do not have appropriate warning properties e.g. vinyl chloride, or When cartridges are not available to protect against all contaminants of concern.	• Chemical resistant clothes, long sleeves, hooded, one or two pieces. • Positive-pressure full facepiece supplied air breathing apparatus or airline system with a 30-minute escape bottle. • Hard hat. • Inner gloves and chemical resistant gloves. • Steel toe and shank boots. • Optional: coveralls and disposable outer boots.
Level C	• When respiratory protection is warranted and cartridge respirators are appropriate. • When work areas contain at least 19.5 percent oxygen.	• Chemical resistant clothes, long sleeves, hood optional, one or two pieces. • Full-facepiece, air purifying respirator equipped with cartridges suitable for the hazard. • Hard hat. • Inner gloves and chemical resistant gloves. • Steel toe and shank boots. • Coveralls and disposable outer boots.

Table 7-1
Level of Protection and Criteria

Level of Protection	Criteria for Use	Equipment
Level D	• When level B or C is not indicated. • When airborne particulates do not warrant respiratory protection. • When work areas contain at least 19.5 percent oxygen.	• Inner gloves and chemical-resistant gloves needed to handle soil or water samples. • Steel toe and shank boots. • Hard hat (ANSI Z891-1969 standard). • Eye protection (ANSI Z87.1-1968) standard. • Optional: coveralls and disposable outer boots.

Notes:

Level A protection will be selected when the highest available level of respiratory, skin, and eye protection is needed.

Contraindications for use of Level A:
- Environmental measures contiguous to the site indicate that air contaminants do not represent a serious dermal hazard.
- Reliable, accurate historical data do not indicate the presence of severe dermal hazards.
- Open, unconfined areas.
- Minimal probability of vapors or liquids (splash hazards) present which could affect or be absorbed through the skin.
- Total vapor readings indicate 500 ppm to 1,000 ppm.

Level B protection will be selected when the highest level of respiratory protection is needed, but cutaneous exposure to the small unprotected areas of the body, (neck and back of head) is unlikely, or where concentrations are not known to be within acceptable standards. Additionally, the permissible limit for exposure to mixtures of all site gases will be checked using the requirements of 1910.1000(d)(2)(i) to ensure that PEL is not exceeded. If the value calculated using this method exceeds 1.0, Level B PPE is required.

Level C protection will be selected when the types and concentrations of inseparable material are known, or reasonably assumed to be no greater than the protection factors associated with air-purifying respirators, and exposure to the unprotected areas of the body is unlikely to cause harm.
Dust concentrations require Level C PPE, where the respirable fractions exceed the PEL of 5 mg/m3 or the total concentrations exceed the PEL of 15 mg/m3.

Level D protection will be chosen when measurements of atmospheric concentrations are less than 2 ppm above background levels and work functions preclude splashes, immersion, or the potential for unexpected inhalation or contact with hazardous levels of any chemicals.

The Project Health and Safety Officer will determine the appropriate level of PPE prior to the initial entry based on the best available information. PPE requirements are subject to change as site information is updated or changes. **The decision to upgrade or downgrade levels of PPE shall be made by the Project Health and Safety Officer.**

Field activities which disturb soils will be initiated in Modified Level D protection except when stated otherwise in the SSHSP or site conditions (e.g., sampling results from previous studies) indicate that modified Level D is inappropriate. Modified Level D protection consists of a hard hat, appropriate chemical-resistant gloves (vinyl or nitrile), eye protection, and chemical-resistant, steel-toed and shank boots. Work coveralls (full length sleeves and pants) will be worn if free product or contaminants identified as skin irritants are encountered. This level of protection was selected because the levels of contamination detected in previous studies were low and free product was not detected.

PPE upgrades to Level C will be initiated if airborne concentrations exceeds 2 ppm above the background concentration in the breathing zone or if concentrations of any contaminant exceeds 50 percent of the OSHA PEL. See Table 7-1 for the specific criteria for use and the equipment required for each level of protection.

7.5.4 Air Monitoring

Previous site work indicates that workers may potentially be exposed to low concentrations of numerous chemicals including volatile organic compounds (VOCs), halogenated compounds, and combustible gases/vapors. Based on site history and existing sampling data, "worst case" contaminated areas will be identified prior to initiation of field activities.

Air monitoring using a photoionization detector (PID) and/or other appropriate sampling equipment will be conducted prior to beginning field activities at a new EZ and during ground disturbing activities. The PID will be field calibrated to measure VOCs relative to a 100 ppm

isobutylene standard. If VOCs are detected downhole, colorimetric detector tubes and/or other sampling media may be used to determine the identification and approximate concentration of these compounds.

A combustible gas indicator (CGI) will be used during all soil borings and well installations. The CGI will be field calibrated to measure flammable gases relative to a 23 percent lower explosive limit (LEL) methane standard. Downhole CGI readings will be collected continuously during all soil disturbing operations. Field activities will immediately cease if downhole readings exceed 10 percent LEL. If CGI readings do not subside, a careful investigation and mapping of the area will be made. Operations may not proceed until readings are below 10 percent LEL. The area will be immediately evacuated and the situation re-evaluated to determine how to proceed.

If breathing zone levels exceed 2 ppm or site conditions indicate that additional health and safety precautions are needed, field activities in the area shall stop. Field staff shall notify the Site Supervisor of the situation and he/she shall contact both the Project Manager and the Project Health and Safety Officer. The Project Health and Safety Officer will be responsible for reassessing the hazards and prescribing revised health and safety requirements as necessary, including upgraded PPE requirements, revised work schedules, and revised decontamination procedures. (Typically, PPE will be upgraded to Level C assuming that cartridge respirators are appropriate, otherwise Level B.) See Table 7-1 for specific criteria for each protection level. Work shall not proceed until breathing zone levels return to background levels, and it is reasonably anticipated that breathing zone samples will stay approximately at background levels; or the chemical constituent(s) are identified and appropriate PPE is donned.

Field monitoring values will be recorded in a field logbook and copies must be posted for field personnel review.

On a daily basis, PIDs, CGIs, and other monitoring equipment shall be calibrated or their proper function verified before being used. Throughout the day this equipment shall be periodically checked to ensure that it is working properly. A final calibration shall be conducted at the end of the work day at which time each instrument will be checked to ensure that it is free from surface contamination. Field staff shall record in their field notebooks the fact that they conducted these calibrations and checks and note whether the equipment was or was not functioning properly. When equipment is not functioning properly, it should be brought to the attention of the Site Supervisor or Site Health and Safety Officer who will arrange for repairs and/or replacement of that equipment as needed.

7.5.5 Procedures and Equipment for Extreme Weather Conditions

The seasonal climate in Memphis can be expected to be hot with high relative humidity in the summer months and moderately cold to extremely cold in the winter months. Therefore, heat-and-cold stress will be of concern for all personnel. Adverse weather conditions are important considerations in planning and conducting site operations. Extremes in hot and cold weather can cause physical discomfort, loss of efficiency, and personal injury.

7.5.5.1 Exposure to Hot Weather

Heat stress can result when the protective clothing decreases natural body ventilation even when temperatures are moderate. Various levels of personal protection may require wearing low permeability disposable suits, gloves, and boots which will prevent most natural body ventilation. Discomfort due to increased sweating and body temperature (heat stress) will be expected at the work site.

Heat stress is the metabolic and environmental heat to which an individual is exposed. The manifestations of heat strain are the adjustments made by an individual in response to the stress. The three most important categories of heat-induced illness are: heat exhaustion, heat cramps, and heat stroke. These disorders can occur when the normal responses to increased sweat

production are not adequate to meet the needs for body heat loss or when the temperature regulating mechanisms fail to function properly.

Heat exhaustion is a state of collapse brought about by an insufficient blood supply to the cerebral cortex portion of the brain. The crucial event is low blood pressure caused by inadequate heart output and widespread dilation of blood vessels.

Heat Exhaustion Factors — Factors which can lead to heat exhaustion are as follows:

- Increased dilation of blood vessels causing a decreased capacity of circulation to meet the demands for heat loss to the environment from exercise and from digestive activities.

- Decreased blood volume due to dehydration.

- Reduced blood volume due to lack of physical training, infection, intoxication (from industrial contaminants as well as from drinking alcohol), or heart failure.

Heat Exhaustion Symptoms — The symptoms include extreme weakness or fatigue, dizziness, nausea, or headache. More severe cases may also involve vomiting and possible unconsciousness. The skin becomes clammy and moist, the complexion pale, and the oral temperature stays normal or low, yet the rectal temperature is usually elevated (99.5°F - 101.3°F). Workers who are unacclimated run the highest risk.

Heat Exhaustion Treatment — In most cases, treatment of heat exhaustion is fairly simple. The victim will be moved to a cool place. If the victim is unconscious, medical assistance must be sought. Mild cases may experience immediate recovery; however, more severe cases may require several days care. No permanent effects have ever been reported.

Heat cramps result when the working muscles go into painful spasms. This may occur in people who perspire profusely in heat and who drink large quantities of water, but who fail to replace their bodies' salt. It is the low salt content in the blood that causes the cramping. The abdominal muscles as well as the muscles in the arms and legs may be affected. The cramps may appear during or even after work hours. Persons on a low sodium diet should not be given salt. A physician must be consulted for care of people with this condition.

Heat stroke is the most serious of the health problems that can arise while working in hot environments. It is caused by the breakdown of the thermo-regulatory system under conditions of stress. When this happens, perspiration stops, and the body can no longer regulate its own temperature.

Heat Stroke Symptoms — A heat stroke victim may be identified by hot, dry, and unusually red or spotted skin. The body core temperature can exceed 105°F. Mental confusion, irritability, and chills are common. These are all early warning signs of heat stroke; if the sufferer is not removed from the hot environment at once, more severe symptoms can follow, including unconsciousness, delirium, and convulsions, possibly ending in death.

Heat Stroke Treatment — Heat stroke must be treated as a major medical emergency; medical assistance must be summoned immediately.

Additional treatment:

- First aid must be administered.
- Individual must be moved to a cool location.
- Individual must be cooled through wetting, fanning, or immersion.

Care should be taken to avoid over-cooling and to begin treatment for shock by raising the legs. Early recognition and treatment of heat stroke are the only means of preventing permanent brain damage or death.

To reduce the potential for heat strokes:

- Drink plenty of fluids (to replace loss through sweating).
- Wear cotton undergarments to act as a wick to absorb moisture.
- Make adequate shelter available for taking rest breaks to cool off.

Additional Measures for Extremely Warm Weather:

- Wear cooling devices to aid in ventilation. (NOTE: the additional weight may affect efficiency.)

- Install portable showers or hose down facilities to cool clothing and body.

- Shift working hours to early morning and early evening. Avoid the hottest time of the day.

- Frequently rotate crews wearing protective clothing (if required).

7.5.5.2 Exposure to Cold Weather

Persons working outdoors in temperatures at or below freezing may experience frostbite or hypothermia. Extreme cold for a short time may cause severe injury to the surface of the body. Areas of the body that have a high surface-area-to volume ratio, such as fingers, toes, and ears, are the most susceptible.

Two factors influence the development of cold injury: [illegible] temperature and wind velocity. As a general rule, the greatest incremental increase in wind chill occurs when a wind of 5 mph increases to 10 mph. Additionally, water conducts heat 240 times faster than air, thus, on a cold day the body can cool quickly when PPE is removed and if a person has wet clothing underneath.

Frostbite is a condition in which the cold temperature forms ice crystals in the cells and tissues, dehydrating protoplasm and killing tissues. At the same time, circulation of the blood is blocked. Frostbite could lead to gangrene and amputation.

Frostbite damage occurs in several degrees:

- Frost nip, or incipient frostbite is characterized by sudden whitening of the skin.

- When superficial frostbite occurs, the skin has a waxy or whitish look and is firm to the touch; however, the tissue underneath has retained it resiliency.

- In deep frostbite, the tissues are cold, pale, and solid. The injury is severe. In addition to frostbite, other physiological reactions to cold may be experienced as well. Trench foot, for example, may result from prolonged exposure to low temperatures near, though possibly above, freezing. Walking on the foot is very painful. In very severe cases, the flesh dies and the foot may have to be amputated. Immersion foot is very similar although it is less severe. Although amputation is unusual, some mobility of the limb is lost. Blisters may occur around the lips, nostrils, and eyelids.

Chilblain (pernio), which is an inflammation of the hands and feet caused by exposure to cold and moisture, is characterized by a recurrent localized itching, swelling, and painful inflammation on the fingers, toes, or ears, produced by mild frostbite. Such a sequence produces severe spasms and is accompanied by pain.

Hypothermia occurs when the body loses heat faster than it can produce it. The initial reaction involves the constriction of blood vessels in the hands and feet in an attempt to conserve the heat. After the initial reaction, involuntary shivering begins in an attempt to produce more heat.

Temperature is only a relative factor in cases of hyperthermia. Cases of exposure have occurred in temperatures well above freezing. Humidity is another important factor. Moisture on the skin and clothing will allow body heat to escape many times faster than when the skin and clothing are dry.

Hypothermia occurs when the body's core temperature drops below 96°F. When this happens, the affected person becomes exhausted. He may begin to behave irrationally, move more slowly, stumble, and fall. The speech becomes weak and slurred. If these preliminary symptoms are allowed to pass untreated, stupor, collapse, and unconsciousness occur, possibly ending in death.

To reduce effects of cold exposure:

- **Stay dry.** When the temperature drops below 40°F, change perspiration soaked clothes frequently. When clothes get wet, they lose about 90 percent of their insulating value.

- **Beware of the wind.** A slight breeze carries heat away from bare skin much faster than still air. Wind drives cold air under and through clothing. Wind refrigerates wet clothes. Wind multiplies the problems of staying dry.

- **Understand cold.** Most hypothermia cases develop in temperatures between 30°F and 50°F. Cold water running down the neck and legs or cold water held against the body by wet clothes causes hypothermia.

- **Have shelter available.** Make adequate dry, warm shelter available.

- **Provide warm drinks.**

- **Never ignore shivering.** Persistent shivering is a clear warning that a person is on the verge of hypothermia. Allow for the fact that exposure greatly reduces normal endurance. Warmth generated by physical activity may be the only factor preventing hypothermia.

7.5.6 Personal Decontamination

A CRZ will be established immediate to each sampling/boring site and will include a station for decontaminating equipment and personnel. The CRZ will be covered with sheets of 6-mil polyethylene (typically an area 20-feet by 20-feet is sufficient) with specific stations that will accommodate the removal and disposal of the protective clothing, boot covers, gloves, and respiratory protection if required.

As a general rule, equipment will be decontaminated using a soap and clean water wash solution. Equipment decontamination will be completed by personnel in Level D PPE. In the event of inclement weather (e.g., lightning) or an emergency requiring immediate evacuation, all contaminated equipment will be wrapped and taped in 6-mil polyethylene sheeting and tagged as "contaminated" for later decontamination.

Personnel working in the CRZ will be in one Level of PPE lower than personnel in the EZ. For example, if personnel in the EZ are in Level B, decon workers will be in Level C.

7.5.6.1 Personal Decontamination Procedures

The decontamination procedures, based on Level D protection, will consist of the following:

- Brushing heavily soiled boots and rinsing outer gloves and boots with soap and water.
- Removing outer gloves and depositing them in a plastic-lined container.
- Removing outer chemical protective clothing.

- Washing and rinsing inner gloves.

- Hard hats and eye protection should be washed thoroughly at the end of each work day with a soap and water solution.

- Disposable gloves and any disposable clothing will be disposed of in sealable bags and placed in a clearly labeled 55-gallon drum for disposal by the Navy.

- All field personnel are to be instructed to shower as soon as possible after leaving the site.

Decontamination procedures will be conducted at the lunch break and at the end of each work day. If higher levels of PPE are needed, adjustments will be made to these procedures and an amendment will be made to this CHASP.

All wastes (soil and water) generated during personal decontamination will be collected in clearly labelled 55-gallon drums. The drums will be labeled and characterized by E/A&H or USGS personnel for final disposal by the Navy.

7.5.6.2 Closure of the Personal Decontamination Station

All disposable clothing and plastic sheeting used during site activities will be double-bagged and disposed of in a refuse container. Decontamination and rinse solutions will be placed in a clearly labeled 55-gallon drum for later analysis and disposal. All washtubs, pails, buckets, etc., will be washed, rinsed, and dried at the end of each workday.

7.5.7 Work Limitations

All site activities will be conducted during daylight hours only. All personnel scheduled for these activities will have completed initial health and safety training and actual field training as

specified in 29 CFR 1910.120(e). All supervisors must complete an additional 8 hours of training in site management. All personnel must complete an 8-hour refresher training course on an annual basis in order to continue working at the site.

7.5.8 Exposure Evaluation

All personnel scheduled for site activities will have had a baseline physical examination which includes a stressing exam of the neurologic, cardiopulmonary, musculoskeletal and dermatological systems, pulmonary function testing, multi-chemistry panel and urinalysis, and will have been declared fit for duty. An exposure history form will be completed for each worker participating in site activities. An examination and updated occupational history will be repeated on an annual basis and upon termination of employment, as required by 29 CFR 1910.120(f). The content of the annual or termination examination will be the same as the baseline physical. A qualified physician will review the results of the annual examination and exposure data and request further tests or issue medical clearances as appropriate.

After any job-related injury or illness, there will be a medical examination to determine fitness for duty or any job restrictions. The Site Health and Safety Manager will review the results with the examining physician before releasing the employee for work. A similar examination will be performed if an employee has missed at least three days of work due to a non-job related injury or illness requiring medical attention. Medical records shall be maintained by the employer or the physician for at least 30 years following the termination of employment.

7.6 Medical Monitoring Program

All E/A&H or USGS personnel who enter hazardous-waste/spill sites or have the potential for exposure to hazardous materials from these sites must participate in the E/A&H Medical Monitoring Program or an equivalent program. The program is conducted by E/A&H's company doctor with the company Health and Safety Officer. The purpose of the program is to identify any pre-existing illnesses or problems that would put an employee at unusual risk

from certain exposures or respirators, and to monitor and evaluate exposure-related events where workers are involved in handling hazardous materials. Project managers should consult with the Health and Safety Officer and/or the company doctor concerning the scope of work and known or anticipated chemical hazards associated with each project.

E/A&H maintains the right to exclude certain individuals from particular jobs based on reports from the company doctor. The program will be reviewed on an annual basis to determine its effectiveness. The company doctor has been employed as an independent contractor to provide medical monitoring for E/A&H.

The doctor is responsible for the following aspects of the Medical Monitoring Program:

- Selection and quality assurance of medical and laboratory services involved in carrying out the monitoring program.
- Development of a uniform medical record.
- Record retention.
- Employee notification of examination results.
- Determination of content of the medical and biological monitoring programs.
- Record review and correlation between potential exposure and effect.
- Monitoring job-related illness and injury for each employee.

7.6.1 Preplacement Examinations

Each E/A&H employee will be given a preplacement examination: to identify any preexisting illness or problem that would put the employee at an unusual risk from certain exposures; to assure that each employee can safely use negative-pressure respirators; and to develop a database to assess any exposure-related events detected during periodic medical monitoring. Data accumulation will include variables such as age, sex, race, smoking history, prior employment history, and other conditions that might bear upon the occurrence of subsequent events once employment begins.

The preplacement examination includes:

- Occupational history including previous chemical and carcinogenic exposures.
- Medical history including demographic data, family history, personal habits, past medical history, and a review of current systems.
- Fertility history.
- Physical examination stressing the neurologic, cardiopulmonary, musculoskeletal, and dermatological systems.
- Physiological parameters including blood pressure and visual acuity testing.
- Pulmonary function testing including FVC, FEVI, and FEV 25-75.
- Electrocardiogram.
- PA and lateral chest X-ray.

- A multi-chemistry panel including tests of kidney and liver function.

- Red blood cell cholinesterase.

- Audiogram.

The history, physiological parameters, X-ray, screening tests, and laboratory studies will be conducted before the physical examination. After the physical examination, the medical examiner will review the results of the examination and special studies with each employee and facilitate referral for further evaluation of abnormalities detected during this examination. The Site Health and Safety Officer will provide each employee with a written summary and detailed results of the examination along with identification of any job restrictions. Additional medical testing procedures (e.g., ophthalmology/optometric assessment, specialized audiometric testing, etc.) may be required at the discretion of E/A&H's attending physician.

7.6.2 Periodic and Exit Examinations

An examination and updated occupational history will be repeated annually and include:

- Updated occupational and medical history.

- Physical examination stressing the neurologic, cardiopulmonary, musculoskeletal, and dermatological systems.

- Pulmonary function testing including FVC, FEVI, and FEV 25-75.

- Multi-chemistry panel including tests of kidney and liver function.

- Urinalysis.

The company doctor will review the results of annual examination and exposure data and request further tests or issue medical clearances as appropriate. An examination will also be administered when an employee leaves the company. The company doctor will be consulted for the contents of the exam except when the employee has had an exam within 6 months, or when there has been no site work since the last examination.

7.6.3 Return-to-Work Examinations

After any job-related injury or illness, a medical examination is required to determine fitness for duty or to identify any job restrictions. The medical examiner will review the results of this back-to-work examination with the company doctor before releasing the employee for work. A similar examination will be performed if an employee has missed at least three days of work due to a non-job-related injury requiring medical attention.

7.6.4 Confidentiality

Medical records will be maintained in a confidential manner so that only authorized persons will have access to the records. The authorized personnel will include medical staff of the joint venture or contract medical personnel, the individual, the individual's personal physician, or the individual's designated representative. Upon written request, the individual may obtain a copy of the medical file which will be provided within 15 days of the receipt of the written request. Information used for research, testing, statistical, or epidemiologic purposes will have all identifying data removed including the identity of the individual. Any medical information or findings obtained which do not affect the individual's job performance will not be made available to E/A&H in order to maintain the patient-physician confidentiality. Upon death, retirement, resignation, or other termination of services, the records will be retained by E/A&H or contracting physician.

7.7 Authorized Personnel

Personnel anticipated to be onsite at various times during site activities include:

- Principal-In-Charge — Dr. James Speakman (E/A&H)
- Task Order Manager — Mr. Lawson Anderson (E/A&H)
- Project Manager — Ms. Ginny Gray (E/A&H)
- Project Health & Safety Officer — Mr. Doug Petty (E/A&H)
- Field Environmental Scientist — Mr. Robert Smith (E/A&H)
- Field Geologist — Mr. Ben Brantley (E/A&H)
- Site Supervisor — To Be Determined
- Site Health & Safety Officer — To Be Determined
- Engineer-in-Charge — Mr. Mark Taylor (SOUTHDIV)
- Naval Air Station Memphis, Tennessee Site Contact — Ms. Tonya Barker

7.7.1 Responsibilities of Site Supervisor

The Site Supervisor will direct the site operations and, relative to health and safety, is responsible for assuring that:

- Field staff follow the CHASP, SSHSP, and other safety and health standard operating procedures (SOPs). Personnel that do not comply are retrained and/or instructed to leave the site and not allowed to return.

- Field staff have current HAZWOPER training.

- Field staff know who the Site Health and Safety Officer is.

- Field staff know the site-specific safety and health concerns.

- There is an adequate onsite supply of health and safety equipment.

- Field staff participate in the E/A&H Medical surveillance program (or in the case of subcontractors, an equivalent program).

- Field staff attend safety and health "kick-off" orientation and other site safety briefings.

The Site Supervisor is also responsible for assuring that field staff who may be exposed to unique or special hazards have the training or experience necessary to safely conduct their work.

7.7.2 Responsibilities of Site Health and Safety Officer

The responsibilities of the Site Health and Safety Officer include:

- Providing the Site Supervisor with technical input on site health and safety issues.

- Observing field personnel and reporting to the Site Supervisor on the effectiveness of the CHASP and SSHSP, and observing whether field staff are utilizing proper work practices and decontamination procedures.

- Reporting significant safety violations to the Project Manager and/or Project Health and Safety Officer.

- Conducting safety briefings during field activities.

- Assuring that a copy of the Health and Safety Plan is maintained onsite during all field activities.

- Maintaining a file of HAZWOPER training certificates and appropriate refresher training certificates for onsite personnel.

The Site Health and Safety Officer will have the following qualifications: (1) 40 hours OSHA training or equivalent experience, (2) 24 hours of supervisory training or equivalent experience, (3) knowledge of the health and safety concerns for the specific work tasks being conducted, and (4) shall be trained to use the air monitoring equipment; be able to interpret the data collected with the instruments; be familiar with symptoms of chemical exposure, heat stress, and cold exposure; and know the location and proper use of onsite safety equipment. He will also be familiar with this CHASP.

The position of Site Health and Safety Officer may rotate. Often, particularly on small projects, this function is not a full time responsibility. Rather, a member of the field team is selected to serve as the Site Health and Safety Officer during a particular task. When that task is completed and/or field staff change, the Site Health and Safety Officer may change as well.

The following criteria outline when the Site Health and Safety Officer will be replaced: (1) termination of employment, (2) end of work task, (3) end of shift, (4) sickness, (5) injury, or (6) death. The SAP calls for one work shift per day. If circumstances arise that require multiple work shifts, an alternate Site Health and Safety Officer will be designated.

7.7.3 Responsibilities of Onsite Field Staff

The health and safety responsibilities of field staff include:

- Being familiar with and complying with the CHASP and SSHSP.
- Attending site health and safety briefings and being aware of anticipated chemical, physical, and biological hazards and knowing what to do when these hazards are encountered.
- Being properly trained on PPE use, safe work practices, decontamination procedures to be followed, and emergency procedures and communications.

- Properly utilizing required PPE, including respiratory protective equipment.

- Having up to date HAZWOPER training and then providing the Site Supervisor with documentation that their training is current.

- Being an up to date participant in an acceptable medical surveillance program.

- Using the buddy system when wearing respiratory protective equipment. When working in Level C or higher, a third person shall be at the work area. This person shall be suitably equipped to provide logistical and safety support to the entry team.

- Being fit-tested and physically capable of using a respirator. Should the use of respiratory protection be required, then field workers shall not have facial hair which interferes with achieving a proper fit.

In addition, field staff should always be alert and use their senses (sight, smell, etc.) to identify and react to potentially dangerous situations. When working in the EZ, visual contact should be maintained between personnel and field personnel should be close enough to assist each other during an emergency. Procedures for leaving a contaminated area must be planned and implemented before going onsite in accordance with the SSHSP.

The number of personnel and equipment in the contaminated area should be kept to a minimum in order to achieve effective site operations. All visitors to the job site must comply with the SSHSP procedures. PPE may be modified for visitors depending on the situation. Modifications must be approved by the Project Health and Safety Officer.

7.8 Emergency Information

All hazardous-waste site activities present a potential risk to onsite personnel. During routine operations risk is minimized by establishing good work practices, staying alert, and by using proper PPE. Unpredictable events such as physical injury, chemical exposure, or fire may occur and must be anticipated.

If any situation or unplanned occurrence requires outside or support service, Ms. Tonya Barker, NAS Memphis Site Contact, will be informed and the appropriate contact from the following list will be made:

Contact	Agency or Organization	Telephone
Tonya Barker	Naval Air Station, Memphis	(901) 873-5461/5462
Mark Taylor	SOUTHDIV Engineer-in-Charge	(803) 743-0573
Law Enforcement	NAS Memphis Base Security	9-911
Fire Department	NAS Memphis	9-911
Ambulance Service	Naval Hospital, Millington Navy Road	(901) 873-5801/5802 or 9-911
Hospital	Methodist North Hospital 3960 Covington Pike	(901) 372-5211 or 9-911
Southern Poison Control Center	—	(901) 528-6048
Lawson Anderson	EnSafe/Allen & Hoshall Memphis, Tennessee	(901) 372-7962
Doug Petty	EnSafe/Allen & Hoshall	(901) 372-7962

Mark Taylor, SOUTHDIV Engineer-in-Charge will be contacted after appropriate emergency measures have been initiated onsite.

7.8.1 Site Resources

Cellular telephones will be used for emergency use and communication/coordination with NAS Memphis. First aid and eye wash equipment will be available at the work area.

7.8.2 Emergency Procedures

Conditions which may constitute an emergency include any member of the field crew being involved in an accident or experiencing any adverse effects or symptoms of exposure while onsite, or if a condition is discovered that suggests the existence of a situation more hazardous than anticipated.

The following emergency procedures should be followed:

- Site work area entrance and exit routes will be planned and emergency escape routes delineated by the Site Health and Safety Officer.

- If any member of the field team experiences any effects or symptoms of exposure while on the scene, the entire field crew will immediately halt work and act according to the instructions provided by the Site Health and Safety Officer.

- For applicable site activities, wind indicators visible to all onsite personnel will be provided by the Site Health and Safety Officer that indicate possible routes for upwind escape.

- The discovery of any conditions that would suggest the existence of a situation more hazardous than anticipated will result in the suspension of work until the Site Health and Safety Officer has evaluated the situation and provided the appropriate instructions to the field team.

- If an accident occurs, the Project Manager is to complete an Accident Report Form (See Attachment C) for submittal to the managing principal-in-charge of the project.

- If a member of the field crew suffers a personal injury, the Site Health and Safety Officer will call **(901) 372-5211 or 9-911** (serious injury) to alert appropriate emergency response agencies, or administer onsite first aid (minor injury) as the situation dictates. An Accident Report Form will be completed for any such incident.

- If a member of the field crew suffers chemical exposure, the affected body areas should be flushed immediately with copious amounts of clean water, and if the situation dictates, the Site Health and Safety Officer should alert appropriate emergency response agencies or personally ensure that the exposed individual is transported to the nearest medical treatment facility for prompt treatment. (See Attachment B for directions to the emergency medical facility.) An Accident Report Form will be completed for any such incident.

Additional information on appropriate chemical exposure treatment methods will be provided through MSDS in Attachment A of each SIP. Directions to the nearest emergency medical facility capable of providing general emergency medical assistance and treating chemical burns

are provided in Attachment B of this CHASP. Directions from individual sites to the NAS Memphis South Gate will be provided as Attachment B of each SIP.

7.9 Forms

The following forms will be used in implementing this CHASP:

Plan Acceptance Form
Plan Feedback Form
Exposure History Form
Accident Report Form

A SSHSP Plan Acceptance Form will be filled out by all employees working on the site before site activities begin. The Plan Feedback Form will be filled out by the Site Health and Safety Officer and any other onsite employee who wishes to fill one out. The Exposure History Form will be completed by both the Project Manager and the individual(s) for whom the form is intended. Examples of each form are provided in Attachment C of this plan.

All completed forms must be returned to the Task Order Manager at EnSafe/Allen & Hoshall, Memphis, Tennessee.

ATTACHMENT A

ENSAFE CORPORATE *HEALTH AND SAFETY MANUAL*

DRILLING SAFETY GUIDE

Appendix B

Drilling Safety Guide

Drilling Safety Guide

EnSafe is concerned about employee safety while working on or around drill rigs as well as when traveling to and from a drilling site, moving the drill rig and tools from location to location on a site, and during maintenance of the drill rig. Every drill crew will have a designated safety supervisor. The safety supervisor will have the responsibility for ensuring that all drilling operations are conducted in a safe manner. All personnel working on, with, or around a drill rig will be under the jurisdiction of the rig safety supervisor.

Drill Rig Safety Supervisor

The safety supervisor for the drill crew will be the drill rig operator. However, the EnSafe safety officer still maintains the overall safety responsibility for the site. The drill crew safety supervisor is a direct representative of the site health and safety supervisor and will report any safety problems directly to the site health and safety officer. The drill rig safety supervisor will:

- Be the leader in using proper personal protective equipment. He/she will set an example for other personnel to follow.
- Enforce the requirements of the health and safety plan and take appropriate actions when other personal are not following the requirements of the health and safety plan.
- Ensure that all drill rig and associated drill rig equipment is properly maintained.
- Ensure that all drill rig operating personnel are thoroughly familiar with the drill operations.
- Enspect the drill rig and associated drill rig equipment for damage before starting drilling operations. Check for structural damage, loose bolts or nuts, correct tension in chains and cables, loose or missing guards or protective covers, fluid leaks, damaged hoses and/or damaged pressure gauges and pressure relief valves.
- Test all emergency and warning devices such as emergency shut-down switches at least daily (prior to starting drilling operations). Drilling will not be permitted until all emergency and warning devices are functioning.
- Conduct a safety briefing daily before starting drilling operations. Any new employee will receive a copy of the drilling operations safety manual, and the drill rig manufacturer's operating and maintenance manual.
- Ensure that each employee reads and understands the drill rig manufacturer's operating and maintenance manual.
- Observe the mental, emotional, and physical capabilities of each worker.
- Ensure that each drill rig has a first aid kit and fire extinguisher.
- Maintain a list of emergency contact telephone numbers. This list will be posted in a prominent location and each drill rig employee will be informed of the list's location.

Drill Rig Personnel Protective Equipment

For most geotechnical, mineral, and/or groundwater drilling, drill rig personal protective equipment will include the following:

- Hard hat
- Safety shoes with steel toe and steel shank (or equivalent)
- Gloves
- Safety glasses with side shields
- Close-fitting but comfortable clothes
- Hearing protection

It is important that clothing does not have loose ends, straps, drawstrings or belts, or other unfastened parts that might become caught in or on a rotating or translating part of the drill rig.

Rings, necklaces, or other jewelry will not be worn during drilling operations.

Additional protective equipment may be required by the Site-Specific Health and Safety Plan.

Drill Rig Housekeeping

The following housekeeping measures must be taken for all drilling operations.

- Suitable storage locations will be provided for all tools, materials, and supplies. The storage should be conveniently located and will provide for safe handling of all supplies.
- Drill tools, supplies, and materials will not be transported on the drill rig unless the drill rig is designed and equipped to carry drill tools, supplies, and materials.
- Pipe, drill rods, casing, augers. and similar drilling tools when stored will be stacked in a manner that will prevent spreading, rolling, or sliding.
- Penetration or other driving hammers will be secured to prevent movement when not in use.
- Work areas, platforms, walkways, scaffolding, and other access ways will be kept free of materials, debris and obstructions and substances such as ice, grease, or oil that could cause a surface to become slick or otherwise hazardous.
- Never store gasoline in a nonapproved container. Red, nonsparking, vented containers marked with the word gasoline will be used. The fill spout will have a flame arrester.
- Prior to drilling, adequate site clearing and leveling will be performed to accommodate the drill rig and supplies and to provide a safe working area. Drilling will not be started when tree limbs, unstable ground or site obstructions cause unsafe tool handling conditions.

Maintenance Safety

Well maintained drilling equipment makes drilling operations safer. When performing equipment/tool maintenance, the follow safety precautions will be followed:

- Safety glasses will be worn when maintenance is performed on drill rigs or drilling tools.
- Shut down the drill rig engine to make repairs or adjustments to the rig or to lubricate fittings (except to make repairs or adjustments that can only be made while the engine is running).
- Always block the wheels or lower the leveling jacks or both. Set the hand brake before working under a drill rig.
- Release all pressure on hydraulic systems, the drilling fluid system, and the air operating system of the drill rig prior to performing maintenance.
- Use extreme caution when opening drain plugs and radiator caps and other pressurized plugs and caps.
- Allow time for the engine and exhaust to cool before performing maintenance on these systems.
- Never weld or cut on or near the fuel tank.
- Do not use gasoline or other volatile or flammable liquids as a cleaning agent.
- Follow the manufacturer's recommendations for quantity and type of lubricants, hydraulic fluids and coolants.
- Replace all caps, filler plugs, protective guards or panels, and high pressure hose clamps and chains or cables that have been removed during maintenance.
- Perform a safety inspection prior to starting drilling equipment after maintenance is performed.

Safe Use of Hand Tools

There are a large number of hand tools that can be used on or around a drill rig. The most important rule of hand tools is to use a tool for its intended purpose. The following are a few general and specific safety rules to follow when using hand tools.

- When using a hammer, wear safety glasses and require all others around you to wear safety glasses.
- When using a chisel, wear safety glasses and require all others around you to wear safety glasses.
- Keep all tools cleaned and stored in an orderly manner.
- Use wrenches on nuts, not pliers.
- Use screwdrivers with blades that fit the screw slot.
- When using a wrench on a tight nut, use some penetrating oil, use the largest wrench available that fits the nut, when possible pull on the wrench handle rather than pushing, and apply force to the wrench with both hands when possible and with both feet firmly placed. Do not push or pull with one or both feet on the drill rig or the side of a mud pit or some other blocking-

off device. Always assume that you may lose your footing. To avoid serious injury if you fall, remove sharp objects from the area near you.

- Keep all pipe wrenches clean and in good repair. The jaws of pipe wrenches will be wire brushed frequently to prevent accumulation of dirt and grease which cause wrenches to slip.
- Never use pipe wrenches in place of a rod holding device.
- Replace hock and heel jaws when visibly worn.
- When breaking tool joints on the ground or on a drilling platform, position hands so that fingers will not be smashed between the wrench handle and the ground or the platform if the wrench were to slip or the joint suddenly to let go.

Safety During Drilling Operations

- Do not drive a drill rig from hole to hole with the mast (derrick) in the raised position.
- Before raising the mast. look up to check for overhead obstructions.
- Before raising the mast, all drill rig personnel (except the person raising the mast) and visitors will be cleared from the area immediately to the rear and sides of the mast. All drill rig personnel and visitors will be informed that the mast is being raised prior to raising the mast.
- All drill rig personnel and visitors will be instructed to stand clear of the drill rig immediately prior to and during starting of the engine.
- All gear boxes will be in the neutral position, all hoist levers will be disengaged, all hydraulic levers will be in the nonactuating positions, and the cathead rope will not be on the cathead before starting the drill rig engine.
- The drill rig must be leveled and stabilized with leveling jacks and/or solid cribbing before the mast is raised. The drill rig will be leveled if settling occurs after initial setup.
- The mast will be lowered only when the leveling jacks are down. The leveling jacks must be in the down position until the mast is completely lowered.
- Secure and/or lock the mast according to the drill rig manufacturer's recommendations before starting drilling operations.
- The drill rig must only be operated from the control position. If the operator must leave the control position, the rotary drive and the feed control must be placed in the neutral position. The drill engine will be shut down when the operator leaves the vicinity of the drill rig.
- Throwing or dropping of tools is not permitted. All tools will be carefully passed by hand between personnel or a hoist line will be used.
- When drilling within an enclosed area, ensure that fumes are exhausted out of the area. Exhaust fumes can be toxic and may not be detected by smell.
- Clean mud and grease from boots before mounting the drill platform. Use hand holds and railings. Watch for slippery ground when dismounting from the drill platform.
- Do not touch any metal parts of the drill rig with exposed flesh during freezing weather. Freezing of moist skin to metal can occur almost instantaneously.
- All unattended boreholes must be covered or otherwise protected to prevent drill rig personnel, site visitors, or animals from stepping or falling into the hole.

- Do not attempt to use one or both hands to carry tools when climbing ladders.

Working on Derrick Platforms

- When working on a derrick platform, us a safety belt and a lifeline. The safety belt will be at least 4 inches wide and will fit snugly but comfortably. The lifeline, will be less than 6 feet long and attached to the derrick.
- The safety belt and lifeline will be strong enough to withstand the dynamic force of a 250-pound weight falling 6 feet.
- A safety climbing device will be used when climbing to a derrick platform that is higher than 20 feet.
- The lifeline will be fastened to the derrick just above the derrick platform to a structural member that is not attached to the platform or to other lines or cables supporting the platform.
- Tools will be securely attached to the platform with safety lines. Do not attach a tool to a line attached to the wrist or other body part.
- When working on a derrick platform, do not guide drill rods or pipe into racks or other supports by taking hold of a moving hoist line or a traveling block.
- Derrick platforms over 4 feet above the ground will have toe boards and safety railings.

Working on the Ground

- Workers on the ground must avoid going under elevated platforms.
- Terminate drilling operations and, if possible, lower the mast during an electrical storm.
- Overhead and buried utilities must be located and marked on all boring location plans and boring assignment sheets.
- When there are overhead electrical power lines at or near a drilling site or project, consider all wire to be charged and dangerous.
- Watch for sagging power lines before entering a site. Do not lift power lines to gain entry. Call the utility to have them lift the power lines or to deenergize the power.
- Operations adjacent to overhead lines are prohibited unless one of the following conditions is satisfied:
  - — Power has been shut off and positive means taken to prevent the lines from being energized.
  - — Equipment, or any part, does not have the capability of coming within the following minimum clearance from energized overhead lines, or the equipment has been positioned and blocked to assure no part, including cables, can come within the minimum clearances listed in the adjacent table.

Power lines nominal system kv	Minimum required clearance
0-50	10 feet
51-100	12 feet
101-200	15 feet
201-300	20 feet
301-500	25 feet
501-750	35 feet
751-1000	45 feet

- While in transit with boom lowered and no load, the equipment clearance will be a minimum of 4 feet for voltages less than 50kv, 10 feet for voltages 51kv to 345kv, and 16 feet for voltages over 345kv.
- Before working near transmitter towers where an electrical charge can be induced in the equipment or materials being handled, the transmitter will be de-energized. The following precautions will be taken to dissipate induced voltages:
  - The equipment will be provided with an electrical ground to the upper rotating structure supporting the boom.
  - Ground jumper cables will be attached to materials being handled by boom equipment when electrical charge may be induced while working near energized transmitters. Crews will be provided nonconductive poles having large alligator clips or other similar protection to attach the ground cable to the load. Insulating gloves will be used.
- Continue to watch overhead power lines. Both hoist lines and overhead power lines can be moved toward each other by the wind.
- If there are any questions concerning drill rig operations on a site in the vicinity of overhead power lines, call the power company. The power company will provide expert advice as a public service.
- Look for warning signs indicating underground utilities. Underground utilities may be located a considerable distance away from the warning sign. Call the utility and jointly determine the precise location of all underground utility lines, mark and flag the locations, and determine the specific precautions to be taken to ensure safe drilling operations.

Wire Rope Safety

- All wire ropes and fittings will be visually inspected at least once a week for abrasion, broken wires, wear, reduction in rope diameter, reduction in wire diameter, fatigue, corrosion, damage from heat, improper reeving, jamming, crushing, bird caging, kinking, core protrusion, and damage to lifting hardware.
- Wire ropes must be replaced when inspection indicates excessive damage. The *Wire Rope User's Manual* may be used as a guide for determining excessive damage.
- Wire ropes that have not been used for a period of a month or more will be thoroughly inspected before being returned to service.
- All manufactured and end fittings and connections must be installed according to the manufacturer's specifications.
- Swivel bearings on ball-bearing type hoisting swivels must be inspected and lubricated daily to ensure that the swivel rotates freely under load.
- Do not drill through or rotate drill through a slipping device, do not hoist more that 10 feet of the drill rod column above the top of the last (mast), do not hoist a rod column with loose tool joints, and do not make up, tighten, or loosen tool hoists while the rod column is being supported by a rod slipping device.

- Do not attempt to brake the fall of a drill rod column with your hands or by increasing tension on the rod slipping device.
- Wire ropes must be properly matched with each sheave. The sheave will pinch wire rope that is too large. Wire rope that is too small will groove the sheave. Once a sheave is grooved, it will severely pinch and damage larger sized wire rope.
- Use tool handling hoists only for vertical lifting of tools. Do not use tool handling hoists to pull on objects away from the drill rig.
- All hoisting hooks will be equipped with safety latches.
- When tools or similar loads cannot be raised with a hoist, disconnect the hoist line and connect the tools directly to the feed mechanism of the drill. Do not use hydraulic leveling jacks for added pull for the hoist line or the feed mechanism of the drill.
- Minimize shock loading of a wire rope; apply loads smoothly and steadily.
- Avoid sudden loading in cold weather.
- Never use frozen ropes.
- Protect wire rope from sharp corners or edges.
- Replace faulty guides and rollers.
- Replace worn sheaves or worn sheave bearings.
- Know the safe working load of the equipment and tackle. Never exceed safe working limits.
- Periodically inspect clutches and brakes of hoists.
- Always wear gloves when handling wire ropes.
- Do not guide wire rope onto hoist drums with your hands.
- After installation of a new wire rope, the first lift must be a light load to allow the wire rope to adjust.
- Never leave a load suspended when the hoist is unattended.
- Never use a hoist line to ride up the mast.

Cathead and Rope Hoist Safety

- Keep the cathead clean and free of rust and oil and/or grease. The cathead must be cleaned with a wire brush when it becomes rusty.
- Check the cathead for rope-wear grooves. If a rope groove forms that is deeper than 1/8-inch, the cathead must be replaced.
- Always start work with a clean, dry, sound rope. A wet or oily rope may grab the cathead and cause drill tools or other items to be rapidly hoisted to the top of the mast. If the rope grabs the cathead or otherwise becomes tangled in the drum, release the rope and sound the alarm for all personnel to clear the area rapidly.
- The rope must not be permitted to contact chemicals.
- Never wrap the rope from a cathead around a hand, wrist, arm, foot, ankle, leg, or any other body part.
- Attach the hammer to the ropeusing a knot that will not slip, such as a bowline.

- A minimum of 18 inches must be maintained between the operating hand and the cathead drum when driving samplers, casing , or other tools. Be aware that the rope advances toward the cathead with each hammer blow as the sampler or other drilling tool advances into the ground. Loosen grip on the rope as the hammer falls. Maintaining a tight grip on the rope increases the chances of being pulled into the cathead.
- Do not use a rope that is longer than necessary. A rope that is too long can form a ground loop or otherwise become entangled with the operator's legs.
- Do not leave a cathead unattended with the rope wrapped on the drum.
- Position all other hoist lines to prevent contact with the operating cathead rope.
- The cathead operator must be on a level surface with good, firm footing conditions.

Auger Safety

- The drill rig must be level, the clutch or hydraulic rotation control disengaged, the transmission in low gear and the engine running at low RPM when starting an auger boring.
- Seat the auger head below the ground surface with an adequate amount of downward pressure prior to rotation.
- Observe the auger head while slowly engaging the clutch or rotation control and start rotation. Stay clear of the auger.
- Slowly rotate the auger and auger head while continuing to apply downward pressure. Keep one hand on the clutch or the rotation control at all times until the auger has penetrated about one foot or more below the surface.
- Follow manufacturer's recommended methods for securing the auger to the power coupling.
- Never place hands or fingers under the bottom of an auger section when hoisting the auger over the top of the auger section in the ground or other hard surfaces such as the drill rig platform.
- Never place feet under the auger section that is being hoisted.
- Stay clear of rotating augers and other rotating components of the drill rig.
- Never reach behind or around a rotating auger.
- Use a long-handle shovel to move auger cuttings away from the auger.
- Augers will be cleaned only when the drill rig is in neutral and the augers have stopped rotating.

Rotary and Core Drilling Safety

- Water swivels and hoist plugs must be lubricated and checked for frozen bearings before use.
- Drill rod chuck jaws must be checked periodically and replaced as necessary.
- The weight of the drill rod string and other expected hoist loads must not exceed the hoist and sheave capacities.
- Only the operator of the drill rig will brake or set a manual chuck to ensure that rotation of the chuck will not occur prior to removing the wrench from the chuck.

- The drill rod chuck jaws will not be used to brake drill rods during lowering into the hole.
- Drill rods will not be held or lowered into the hole with pipe wrenches.
- Do not attempt to grab falling drill rods with hands or wrenches.
- In the event of a plugged bit or other circulation blockage, the high pressure in the piping and hose between the pump and the obstruction must be relieved or bled down prior to breaking the first tool joint.
- Use a rubber or other suitable rod wiper to clean rods during removal from the hole. Do not use hands to clean drilling fluids from the drill rods.
- Do not lean unsecured drill rods against the mast.

ATTACHMENT B

DIRECTIONS TO EMERGENCY MEDICAL FACILITIES

DIRECTIONS TO THE NEAREST MEDICAL FACILITIES

The nearest hospital **and** the nearest facility capable of treating chemical burns are the same facility, which is located at Methodist North Hospital. Therefore, there is only one set of directions.

Nearest Hospital

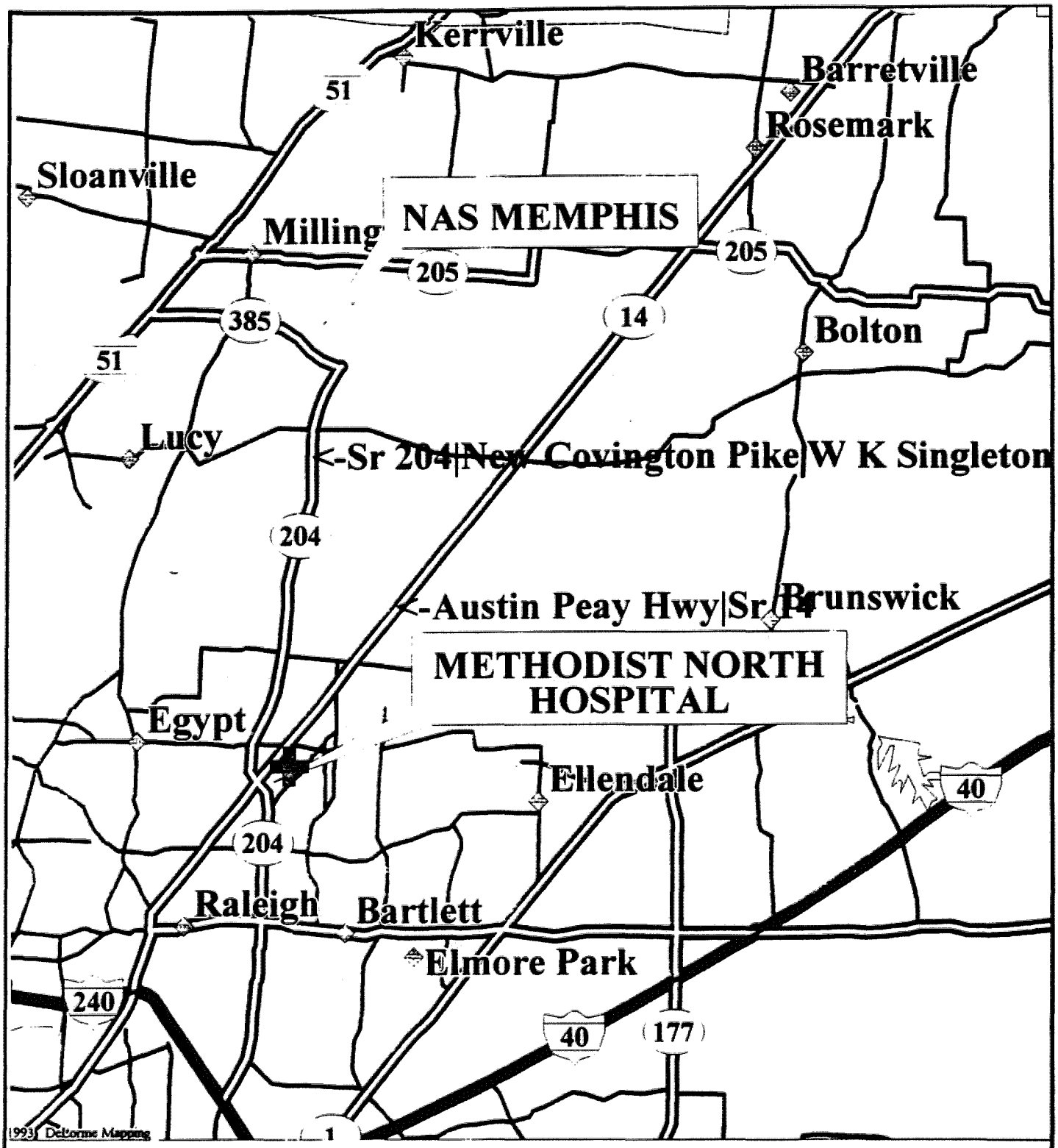
Methodist North Hospital
3960 Covington Pike
Memphis, Tennessee

Emergency Room Telephone Number - (901) 372-5211

Directions to Methodist North Hospital from NAS Memphis Main Gate:

1. Exit base through South Gate (Singleton Parkway).
2. Continue on Singleton Parkway through the stop signs.
4 Singleton Parkway and Covington Pike will intersect at a red light (about 5 miles).
4. You will see the entrance to the emergency room 700 feet past this light on the left.

Also, refer to the Route to Hospital Map on the following page.



HEALTH & SAFETY PLAN
NAS MEMPHIS
MILLINGTON, TN

DIRECTIONS TO THE HOSPITAL

DWG DATE: 10/04/94 | DWG NAME: BOARD

ATTACHMENT C

HEALTH AND SAFETY PLAN FORMS

PLAN ACCEPTANCE FORM

PROJECT HEALTH AND SAFETY PLAN

INSTRUCTIONS: This form is to be completed by each person working on the project work site and returned to EnSafe/Allen & Hoshall, Memphis, Tennessee.

Job No: 2151-016

Contract No: N62467-89-D-0318

Project: Comprehensive Health and Safety Plan

I represent that I have read and understand the contents of the above plan and agree to perform my work in accordance with it.

_____

Signed

_____

Print Name

_____

Company

_____

Date

EMPLOYEE EXPOSURE HISTORY FORM

Employee: _____

Job Name: _____

Date(s) From/To: _____

Hours Onsite: _____

Contaminants (Suspected/Reported):

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

(See Attached Laboratory Analysis)

PLAN FEEDBACK FORM

Problems with plan requirements:

Unexpected situations encountered:

Recommendations for revisions:

ACCIDENT REPORT FORM

SUPERVISOR'S REPORT OF ACCIDENT	DO NOT USE FOR MOTOR VEHICLE OR AIRCRAFT ACCIDENTS
TO	FROM TELEPHONE (Include area code)

NAME OF INJURED OR ILL WORKER AND COMPANY

WORKER'S SOCIAL SECURITY NUMBER

DATE OF ACCIDENT	TIME OF ACCIDENT	EXACT LOCATION OF ACCIDENT

NARRATIVE DESCRIPTION OF ACCIDENT

NATURE OF ILLNESS OR INJURY AND PART OF BODY INVOLVED	LOST TIME YES ☐ NO ☐

PROBABLE DISABILITY (Check one)

FATAL ☐ | LOST WORK DAY WITH ____DAYS AWAY FROM WORK | LOST WORK DAY WITH ____DAYS OF RESTRICTED ACTIVITY | NO LOST WORK DAY ☐ | FIRST-AID ONLY ☐

CORRECTIVE ACTION RECOMMENDED (By whom and by when)

NAME OF SUPERVISOR	TITLE
SIGNATURE	DATE

Appendix E

Site-Specific Health and Safety Plan

SITE-SPECIFIC HEALTH AND SAFETY PLAN

This SSHSP has been written to complement the CHSP. Site-specific details presented in this SSHSP include: potential site contaminants, proposed site activities, action levels (ALs), and initial level of personal protective equipment (PPE). Copies of this plan and the CHSP must be onsite during all field operations.

Applicability

The provisions of this plan are mandatory for EnSafe personnel, who shall read the plan and sign the plan acceptance form before starting site activities. In addition, personnel will operate in accordance with the most current requirements of Title 29 Code of Federal Regulations (CFR) 1910.120, Standards for Hazardous Waste Operators and Emergency Response (HAZWOPER). These regulations include the following provisions for employees: training 1910.120(e), medical surveillance 1910.120(f), and PPE 1910.120(g).

All non-EnSafe personnel present at the work areas shall either adopt and abide by this SSHSP and the corresponding CHSP or shall have their own safety plans which, at minimum, meet the requirements of this SSHSP and the CHSP.

This SSHSP applies to standard field procedures and tasks such as collecting soil and water samples and the nonroutine task of trenching. Other non-routine procedures and tasks involving non-routine risks are not covered in this plan. Examples of **procedures** that are **not covered** in this plan are:

- Confined space entry
- Locating and/or recovering UXO
- Sampling, handling, or removing unidentified drums

Should it be necessary to conduct these or other "high-risk" tasks, specific health and safety procedures must be developed, approved, and implemented before these tasks may proceed.

Authorized Personnel

• NSA Mid-South Contact	Rob Williamson
• TOM/Project Manager	Robert Smith
• Project Health and Safety Officer (PHSO)	Doug Petty, IHIT
• Site Supervisor	Carol Davis
• Site Health and Safety Officer (SHSO)	To Be Determined

Responsibilities of Key Field Staff

It is the overall responsibility of the PHSO to develop and implement the SSHSP. The TOM and PHSO shall approve any changes or modifications to this SSHSP. The SHSO will implement the SSHSP under the PHSO's direction. Health- and safety-related duties may be delegated to qualified individuals by the PHSO or the TOM.

Responsibilities of Site Supervisor

The site supervisor will direct site operations and, relative to health and safety, is responsible for ensuring that:

- Field staff follow the CHSP, SSHSP, and other safety and health standard operating procedures (SOPs). Personnel who repeatedly do not comply shall be retrained and/or instructed to leave the site and not allowed to return.
- Field staff have current HAZWOPER training.
- Field staff know who the PHSO and SHSO are.
- Field staff know the site-specific health and safety concerns.
- The onsite supply of health and safety equipment is adequate.

- Field staff participate in the EnSafe medical surveillance program (or in the case of subcontractors, an equivalent program).
- Field staff attend health and safety "kick-off" orientation and other site safety briefings.

The site supervisor is also responsible for ensuring that field staff who may be exposed to unique or special hazards have the training or experience necessary to safely conduct their work.

Responsibilities of Site Health and Safety Officer

The responsibilities of the SHSO include:

- Providing the site supervisor technical input on site health and safety issues.
- Observing field personnel and reporting to the site supervisor on the effectiveness of the CHSP and SSHSP and whether field staff are using proper work practices and decontamination procedures.
- Reporting significant safety violations to the project manager and/or PHSO.
- Conducting safety briefings as he/she deems appropriate, or when requested by the site supervisor.
- Ensuring that a copy of the appropriate health and safety plans are maintained onsite during field activities.
- Maintaining a file of HAZWOPER training certificates and appropriate refresher training certificates for onsite personnel.

The SHSO will have the following qualifications: (1) 40 hours of Occupational Safety and Health Administration (OSHA) training or equivalent experience, (2) 24 hours of supervisory training or equivalent experience, (3) knowledge of the health and safety concerns for the specific work tasks being conducted, (4) training in the use of the air-monitoring equipment, (5) ability to interpret the data collected with the instruments, (6) familiarity with symptoms of chemical

exposure, heat stress, and cold exposure, and (7) knowledge of the location and proper use of onsite safety equipment. He/she will also be familiar with this health and safety plan.

Responsibilities of Onsite Field Staff

The health and safety responsibilities of field staff include:

- Being familiar with and complying with the CHSP and SSHSP.
- Attending site health and safety briefings and being aware of anticipated chemical, physical, and biological hazards and knowing what to do when these hazards are encountered.
- Being trained on PPE use, safe work practices, decontamination procedures to be followed, emergency procedures, and communications.
- Properly using required PPE, including respiratory protective equipment.
- Having up-to-date HAZWOPER training and providing the site supervisor with documentation of that training.
- Being an up-to-date participant in the EnSafe medical monitoring program.
- Using the buddy system when wearing respiratory protective equipment.
- Being fit-tested and physically capable of using a respirator (when one is required). Should respiratory protection be required, field workers shall not have facial hair that interferes with its proper fit.

In addition, field staff should always be alert and use their senses (sight, smell, taste, etc.), to identify and react to potentially dangerous situations. When working in the exclusion zone (EZ), visual contact should be maintained with other personnel in the area; field personnel should be close enough to assist each other in an emergency. Procedures for leaving the EZ must be planned and all necessary equipment present before entering the EZ.

To maintain effective site operations, minimize the number of personnel and equipment in the contaminated area. Site visitors shall comply with the CHSP and this SSHSP, and have the same responsibilities as field staff. PPE requirements may be modified for visitors, depending on the situation. Modifications must be approved by the PHSO.

Work Zones

Section 3.1 of the CHSP describes the function and interrelation the three work zones at a sampling site or location:

- EZ
- Contaminant Reduction Zone (CRZ)
- Support Zone (SZ)

When determined appropriate by the TOM with input from the RPM, these work zones will be established and used during fieldwork covered under this SSHSP. Each work zone will be clearly marked with cones, barricades, or caution tape, as appropriate, and access to them will be controlled. As a minimum, the area where samples are handled and sampling equipment is decontaminated will be delineated. If needed, a large-equipment decontamination area will be constructed near the EZ.

Authorized personnel will be allowed access to work areas as long as they follow the requirements of this SSHSP and the CHSP, in particular Section 3.2 of the CHSP.

Site Investigations

This work plan includes a subsection that briefly describes the site, including known or suspected site-specific physical and chemical hazards. Additional site-specific information and an individual site map can be found in Section 3 of this work plan. The EZ, CRZ, and SZ for each site will

be established in the field as determined necessary. The use and locations of these zones depend on the work task, layout of the site, meteorological conditions, and logistical factors.

SWMU 17

SWMU 17, UWT S-9 removed in 1996, is approximately 100 feet east of Kearsarge Avenue (formerly 1st Avenue) on the NSA Mid-South Southside in the Building S-9 complex. No evidence of a release was visible at SWMU 17 during the RFA *Visual Site Inspection* (ERC/EDGe, 1990); however, data from the VCA removal in June of 1996 of the UWT, which are presented in Section 4.4 of this VCA work plan, indicate that a release had occurred before the UWT was removed. In the RFA, tank S-9 is listed as 1657, but 1657 is an oil/water separator. The period of operation for SWMU 17 is unknown.

SWMU 17 and the surrounding area are characterized by relatively level, low-relief topography. The immediate area is covered by gravel or asphalt and descends slightly to the south and west toward a north-south drainage ditch (SWMU 38) which flows southward into Big Creek Drainage Canal.

Site Activities

Field activities include confirmatory soil sampling using disposable spoons or decontaminated stainless-steel spoons. Fieldwork is detailed in Sections 2 and 3 of this work plan.

Chemical Hazards and PPE Requirements

The potential contaminants for the Voluntary Corrective Action are petroleum products, metals (e.g., cadmium and lead), and pesticides. Table 4-1 lists exposure guidelines for these contaminants.

It is important that the PPE specified for the project protect against known and suspected site hazards. Protective equipment is selected based on the types, concentrations, and routes of personal exposure that may be encountered. In situations where the types of materials and possibilities of contact are unknown or the hazards are not clearly identifiable, a more subjective determination must be made of the PPE required, and a greater emphasis is placed on experience and sound safety practices.

Table 4-1
Exposure Limits for Expected Site Chemical Hazards

Name	Odor[a] Threshold	OSHA PEL[b]	ACGIH TLV[c]	NIOSH REL[d]	Auto-Ignition (°F)	Flammable Range
Arsenic	N.A.	0.5 mg/m³	0.01 mg/m³	0.02 mg/m³ C	N.A.	N.A.
Beryllium	N.A.	0.002 mg/m³	0.002 mg/m³	0.005 mg/m³ C	N.A.	N.A.
Cadmium	N.A.	0.06 mg/m³ ceiling	0.05 mg/m³	Potential Occupational Carcinogen	N.A	N.A.
Lead	N.A.	0.05 mg/m³	0.05 mg/m³	0.1 mg/m³	N.A.	N.A.
Diesel	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Fog Oil	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Gasoline	N.A.	N.A.	890 mg/m³	N.A.	N.A.	N.A.
Motor Oil	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Dieldrin	N.A.	0.25 mg/m³	N.A.	0.25 mg/m³	N.A.	N.A.

Notes:

[a] = Odor Threshold for Chemicals with Established Occupational Health Standards, American Industrial Hygiene Association, 1989.

[b] = Permissible Exposure Limits (PELs) legal standards enforced by OSHA and found in CFR 1910.1000.

[c] = Threshold Limit Values, and Short-Term Exposure Limits (TLVs and STELs) are recommended guidelines developed by the American Conference for Governmental Industrial Hygienist (ACGIH).

[d] = Recommended Exposure Limits (RELs) are non-enforceable guidelines developed by the National Institute of Occupational Safety and Health Administration (NIOSH) to support OSHA.

N.A. = Not Applicable

ppm = parts per million

mg/m^3 = milligrams per cubic meter

PPE for Confirmatory Sampling:

The initial level of PPE for confirmatory sampling is Level D, which includes:

- Chemical-resistant coveralls (optional)
- Chemical-resistant outer gloves; inner gloves or glove liners (optional)
- Steel toe and steel shank boots
- Hard hat
- Safety glasses with side shields or safety goggles
- Chemical-resistant outer boots (optional)

PPE requirements are subject to change as site information changes or is updated. A decision to deviate from specified levels of PPE as contained in the SSHSP must be made or reviewed by the PHSO.

General Operational and Physical Hazards

Field personnel should be aware of and act in a manner to minimize the dangers associated with physical hazards typically encountered during environmental investigations as discussed in Section 7.1 of the CHSP. At NSA Mid-South, these hazards include heat-related illnesses, snakes, insects, poisonous plants, uneven terrain, slippery surfaces, lifting, and using heavy equipment. Electrical lines may be present either above or below ground, and underground gas, fuel, water, steam, sanitary, and storm water drainage lines may be present.

The Site Supervisor shall be aware of the potential for heat stress (discussed in Appendix C of the CHSP). When necessary, work regimens should be implemented to minimize the potential for employee illness.

Employee Protection

Employee protection for this project is addressed in several ways including the use of: work limitations, specified PPE, air monitoring, decontamination procedures, standard safe work practices, general rules of conduct, procedures for extreme weather conditions, and medical surveillance.

Work Limitations

All site activities will be conducted during daylight only. All personnel scheduled for these activities will have completed initial health and safety training and actual field training as specified in 29 CFR 1910.120(e). All supervisors must complete an additional eight hours of HAZWOPER Site Supervisor Training. All personnel must complete an eight-hour refresher training course annually to continue working onsite.

Personnel and Equipment Decontamination

As needed, a CRZ will be established next to the EZs established for invasive activities and will include stations for decontaminating personnel, PPE, and equipment. Decontamination procedures are discussed in Section 3.3 and 7.8 of the CHSP.

Standard Safe Work Practices

Standard safe work practices include:

- Eating, drinking, chewing gum or tobacco, smoking, or any other activity that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in any area designated as contaminated, unless authorized by the SHSO.
- Hands and face must be thoroughly washed when a person leaves the work area.
- Whenever decontamination procedures for outer garments are in effect, the entire body should be thoroughly washed as soon as practical after leaving the CRZ.

- Contact with contaminated or suspected contaminated surfaces should be avoided. Whenever possible, do not walk through puddles, leachate, or discolored surfaces, or lean, sit, or place equipment on drums, containers, or soil suspected of being contaminated.
- Medicine and alcohol can exacerbate the effects from exposure to toxic chemicals. Prescribed drugs should be not be taken by personnel on cleanup or response operations where the potential for absorption, inhalation, or ingestion of toxic substances exists, unless specifically approved by a qualified physician. Consumption of alcoholic beverages is prohibited.
- Adequate side and overhead clearance must be maintained to ensure that the drill rig boom does not touch or pass close to any overhead power lines or other overhead obstacles or obstructions.
- Local utility representatives shall be requested to identify all underground utilities. Utility lines should be marked using characteristic spray paint or labeled stakes. A buffer zone, 3 yards to either site of a utility line, should be maintained during all subsurface investigations.
- Due to the flammable properties of the potential chemical hazards, all spark or ignition sources should be bonded and/or grounded or mitigated before soil boring advancement or other site activities begin.

General Rules of Conduct

The following general rules of conduct are required for anyone working on this project:

- Liquor, firearms, narcotics, and other contraband items are not permitted on the premises.
- Any violation of local, state, or federal laws, or conduct which is outside the generally accepted moral standards of the community is prohibited.
- Violation of the Espionage Act, willfully hindering or limiting production, or sabotage is not permitted.

- Willfully damaging or destroying property, or removing government records is forbidden.
- Misappropriation or unauthorized alteration of any government record is forbidden.
- Securing government tools in a personal or contractor's tool box is forbidden.
- Gambling in any form, selling tickets or articles, taking orders, soliciting subscriptions, taking up collections, etc., is forbidden.
- Doing personal work in any government shop or office, using government property or material for unauthorized purposes, or using government telephones for unnecessary or unauthorized local or long-distance telephone calls is forbidden.
- Compliance with posted signs and notices is required.
- Boisterousness and noisy or offensive work habits, abusive language, or any oral, written, symbolic, or other communicative expression that tends to disrupt work or morale of others is forbidden.
- Fighting or threatening bodily harm to another is forbidden.
- Defacing any government property is forbidden.
- Wearing offensive logos, pictures, or phrases on clothing is forbidden. Shirts, shoes, and pants or slacks, or cover-all type garments will be worn at all times on government property.

Medical Monitoring Program

This topic is discussed Section 4.5 of the CHSP.

Emergency Information and Procedures

All hazardous waste site activities present a risk to onsite personnel. During routine operations, risk is minimized by establishing good work practices, staying alert, and using proper PPE. Unpredictable events such as physical injury, chemical exposure, or fire may occur and must be anticipated. Emergency contacts to be used during fieldwork at NSA Mid-South are listed in Table 4-2.

Table 4-2

Emergency Contacts

Contact	Agency or Organization	Telephone
Rob Williamson	NSA Mid-South	901/874-5399
Ambulance		911
Emergency Room	Methodist North Hospital	901/384-5211
		911
Southern Poison Control		800/942-5969
Center		901/528-6048
Fire Department		911
Police		911
Robert Smith	Task Order Manager	901/372-7962
Doug Petty	Project Health and Safety Officer	901/372-7962

Site Resources

A cellular telephone will be available in the SZ for routine and emergency communications/coordination with NSA Mid-South personnel. First-aid and eyewash equipment will be available at the work area and in each field office. All field team members have been certified in first-aid and cardiopulmonary resuscitation.

Emergency Procedures

Examples of an emergency include:

- A fire, explosion, or similar event at or near the site whether related to this project or not.
- When a member of the field crew sustains a significant injury, or experiences symptoms of chemical exposure, or other health problem.
- When a condition is discovered which suggests that site conditions are immediately more dangerous or hazardous than anticipated.

In an emergency, the following procedures should be followed:

- If it is necessary to evacuate the area, immediately proceed to a rally point and remain there until instructed otherwise.
- Use planned escape routes. Emergency exit routes and proper use of emergency equipment will be defined for all personnel during an initial safety meeting.
- If a member of the field crew experiences effects or symptoms of exposure while on the scene, the field crew will immediately halt work and act according to the instructions provided by the Site Supervisor or, in his/her absence, the SHSO.
- For applicable site activities, including all Level B activities, use wind indicators to continuously indicate upwind, preferred escape routes, from downwind routes.
- Investigate conditions(s) suggesting that site conditions may be more hazardous than anticipated. Record the condition observed and the decisions made in the safety logbook, or in the field logbook if no safety logbook is being maintained. If there are doubts about how to proceed, suspend work and leave the area until the PHSO has evaluated the situation and provided the appropriate instructions to the field team.
- If an accident occurs, the Site Supervisor is to complete an Accident Report Form for submittal to the TOM and NSA Mid-South.
- If a member of the field crew suffers a personal injury, the SHSO will call 911 for ambulance emergency response, if needed. Ambulance service will be used to transport any injured persons. Next alert appropriate response agencies as the situation dictates. Complete an Accident Response Form for any such incident.
- If a member of the field crew suffers a chemical exposure, flush the affected areas immediately with copious amounts of clean water, and if the situation dictates, the SHSO should alert appropriate emergency response agencies, or personally ensure that the exposed individual is transported to the nearest medical treatment facility for prompt treatment. (See Figure 4-1 for directions to the emergency medical facilities.) If a patient

is contaminated, the ambulance and/or hospital will be notified prior to receiving the patient. An Accident Report Form will be completed for any such incident. Additional information on appropriate chemical exposure treatment methods will be provided through Material Safety Data Sheets (MSDS) in Appendix C.

Forms

The following forms will be used in implementing this health and safety plan:

- Plan Acceptance Form
- Plan Feedback Form
- Accident Report Form

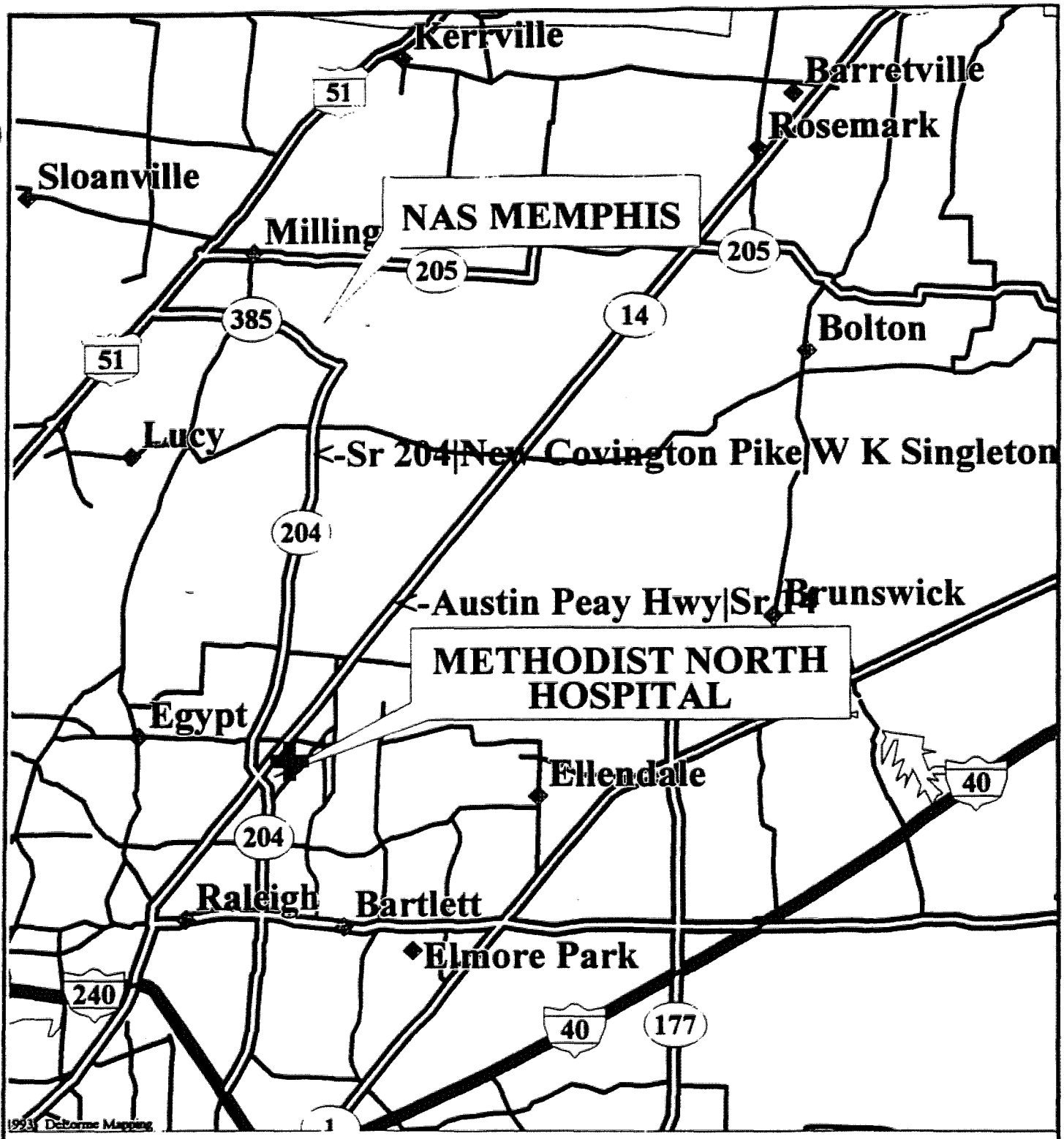
An SSHSP Plan Acceptance Form will be filled out by all employees onsite before activities begin. The Plan Feedback Form will be filled out by the SHSO and any other onsite employee who wishes to do so. Examples of all forms are included in this plan. All completed forms must be returned to the TOM at EnSafe, Memphis, Tennessee.

Directions to the Nearest Medical Facility

The nearest hospital **and** the nearest facility capable of treating chemical burns are the same facility, which is Methodist North Hospital, 3960 New Covington Pike, Memphis, Tennessee 38128. Therefore, there is only one set of directions (see map on following page).

Directions to Methodist North Hospital from NSA Mid-South:

1) Exit base through south gate (Singleton Parkway).
2) Continue on Singleton Parkway through stop signs.
3) Singleton Parkway and Covington Pike will intersect at a red light (about 5 miles).
4) Entrance to the emergency room is 700 feet past this light on the left.



	HEALTH & SAFETY PLAN NAS MEMPHIS MILLINGTON, TN	DIRECTIONS TO THE HOSPITAL
		DWG DATE: 10/04/94 | DWG NAME: BOARD

PLAN ACCEPTANCE FORM

PROJECT HEALTH AND SAFETY PLAN

INSTRUCTIONS: This form is to be completed by each person working on the project site and returned to: EnSafe, Memphis, Tennessee.

Job No: CTO 0106

Contract No: N62467-89-0318

Project: NSA Mid-South Voluntary Corrective Action Field Activities

I have read and understand the contents of the above plan and agree to perform my work in accordance with it.

_____
Signed

_____
Print Name

_____
Company

_____
Date

EMPLOYEE EXPOSURE HISTORY FORM

Employee: _____

Job Name: _____

Date(s) From/To: _____

Hours Onsite: _____

Contaminants (Suspected/Reported):

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

(See Attached Laboratory Analysis)

PLAN FEEDBACK FORM

Problems with plan requirements:

Unexpected situations encountered:

Recommendations for revisions: