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NAS PENSACOLA  
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SITE ASSESSMENT REPORT FOR SITE 23 WITH TRANSMITTAL LETTER NAS  
PENSACOLA FL  
2/25/1998  
NAVY PUBLIC WORKS CENTER

Greg's

**SITE ASSESSMENT REPORT  
FDEP REGISTERED NUMBER 179202973**

**SITE 23  
NAVAL AIR STATION  
PENSACOLA, FLORIDA**

**PREPARED BY:**

**NAVY PUBLIC WORKS CENTER  
BUILDING 458  
PENSACOLA, FLORIDA 32508-6500**

**AUTHOR: GREG CAMPBELL, P.E.  
FEBRUARY 1998**

**PREPARED FOR:**

**SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND  
2155 EAGLE DR., P.O. BOX 190010  
NORTH CHARLESTON, SOUTH CAROLINA 29418**

**BYAS GLOVER, CODE 18410, ENGINEER-IN-CHARGE**



DEPARTMENT OF THE NAVY

NAVY PUBLIC WORKS CENTER  
310 JOHN TOWER ROAD  
PENSACOLA, FLORIDA 32508-5303

Greg

IN REPLY REFER TO:

5090  
Code 4231  
Ser 1005  
25 February 1998

Mr. John Mitchell  
Remedial Project Manager  
Florida Dept. Of Environmental Protection  
Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

Re: SITE ASSESSMENT REPORT (SAR) - SITE 23, NAVAL AIR STATION,  
PENSACOLA, FLORIDA. FDEP REGISTERED NUMBER 179202973.

Dear Mr. Mitchell:

Enclosed are two copies of the reference report for your action. If you have any questions, please contact Mr. Greg Campbell of my staff at (904) 452-4315 or 452-8587.

Sincerely,

KURT R. GIES  
LT, CEC, USN  
By direction of  
the Commanding Officer

Enclosure: (2 copies)  
(1) Site Assessment Report (SAR)  
Site 23, Naval Air Station, Pensacola, Florida

Copy to:  
SOUTHNAVFACENGCOM (Code 18410,  
Byes Glover)  
NAS Envir. Dept. (Dean Spencer,  
Code 00500)

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APPENDIX A:	Monitoring Well Construction Diagram
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APPENDIX C:	Soil and Groundwater Analytical Results

## **1.0 INTRODUCTION**

### **1.1 PURPOSE**

The Navy Public Works Center, Naval Air Station, Pensacola, Florida, was retained by Southern Division Navy Facilities Engineering Command (SOUTHNAVFACENGCOM) to conduct a site assessment and remediation plan (if warranted) at the Chevalier Field Pipe Leak Area, Site 23, Pensacola Naval Air Station (NASP), Pensacola, Florida in December 1994.

The site was originally listed under the Installation Restoration Program for NASP, but was removed from the list in July 1994 when only petroleum constituents were found at the site.

The findings and conclusions of the field investigation for the Site Assessment for Site 23 are presented herein.

### **1.2 SITE LOCATION AND AREA OF INVESTIGATION**

The Pensacola Naval Air Station (NASP) is approximately 5,800-acres and is located on a peninsula bounded on the east and south by Pensacola Bay and Big Lagoon and on the north by Bayou Grande (Figure 1-1). The Chevalier Field Pipe Leak Area is located within the confines of NAS Pensacola in Section 1, Range 30W, Township 3S. The site is located near the southwestern corner of Chevalier Field. Site location maps are included as Figures 1-2 and 1-3 showing the site in relation to surrounding features.

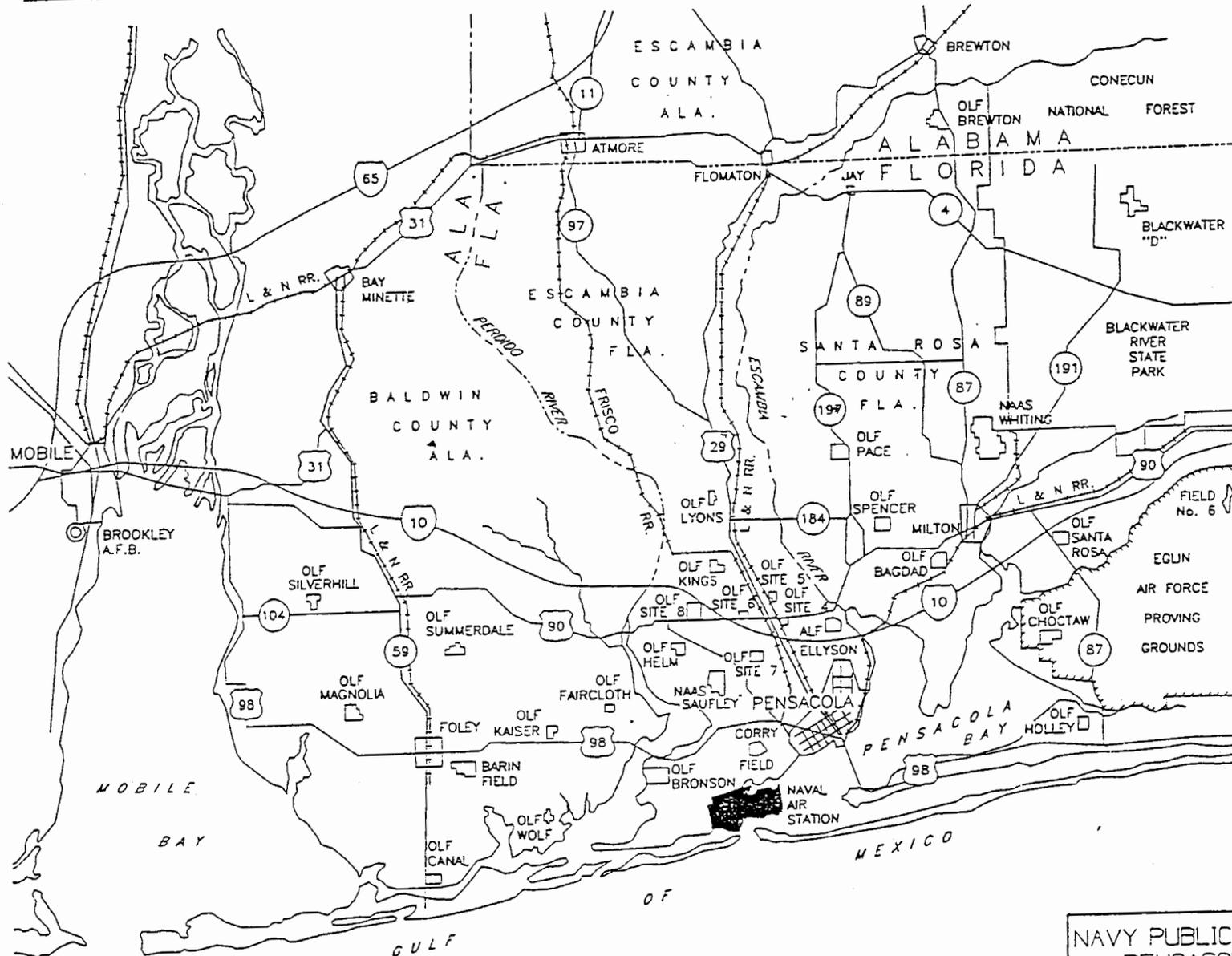
The paved sections of the site include Murray Road, Taylor Road and a paved drainage ditch. A section of Murray Road occupies most of the southwestern portion of the site. The paved drainage ditch transverses the length of the site and is directed south beneath Murray Road via a culvert. The eastern edge of the site was once occupied by a portion of Chevalier Field's concrete apron until 1995 when as part of Base Realignment and Construction (BRAC), several underground utilities were installed throughout the site area.

### **1.3 SITE HISTORY AND OPERATIONS**

The site is the location of two separate underground fuel pipeline leaks. In 1965, a leak occurred at the underground pipeline near the center of the site, resulting in the loss of an unknown quantity of Navy Special Fuel Oil. In 1968 and 1969, another leak of unknown quantity was discovered in the underground pipeline carrying Diesel Fuel Marine in approximately the same area as the 1965 leak. The leaks were repaired, but no contaminated soil was removed from the site (NEESA 1983). An underground AVGAS pipeline and aviation maintenance pit tanks were located around the perimeter of Chevalier Field. The underground AVGAS pipeline and aviation maintenance pit tanks were purged and abandoned sometime in the 1990's.

### **1.4 INITIAL REMEDIAL ACTION**

No initial remedial action was performed at the site.



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PENSACOLA, FLORIDA

SCALE: 1" = 10 MI  
DATE: 10/18/84

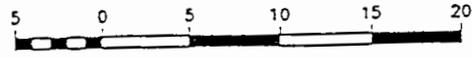
FIGURE 1-1

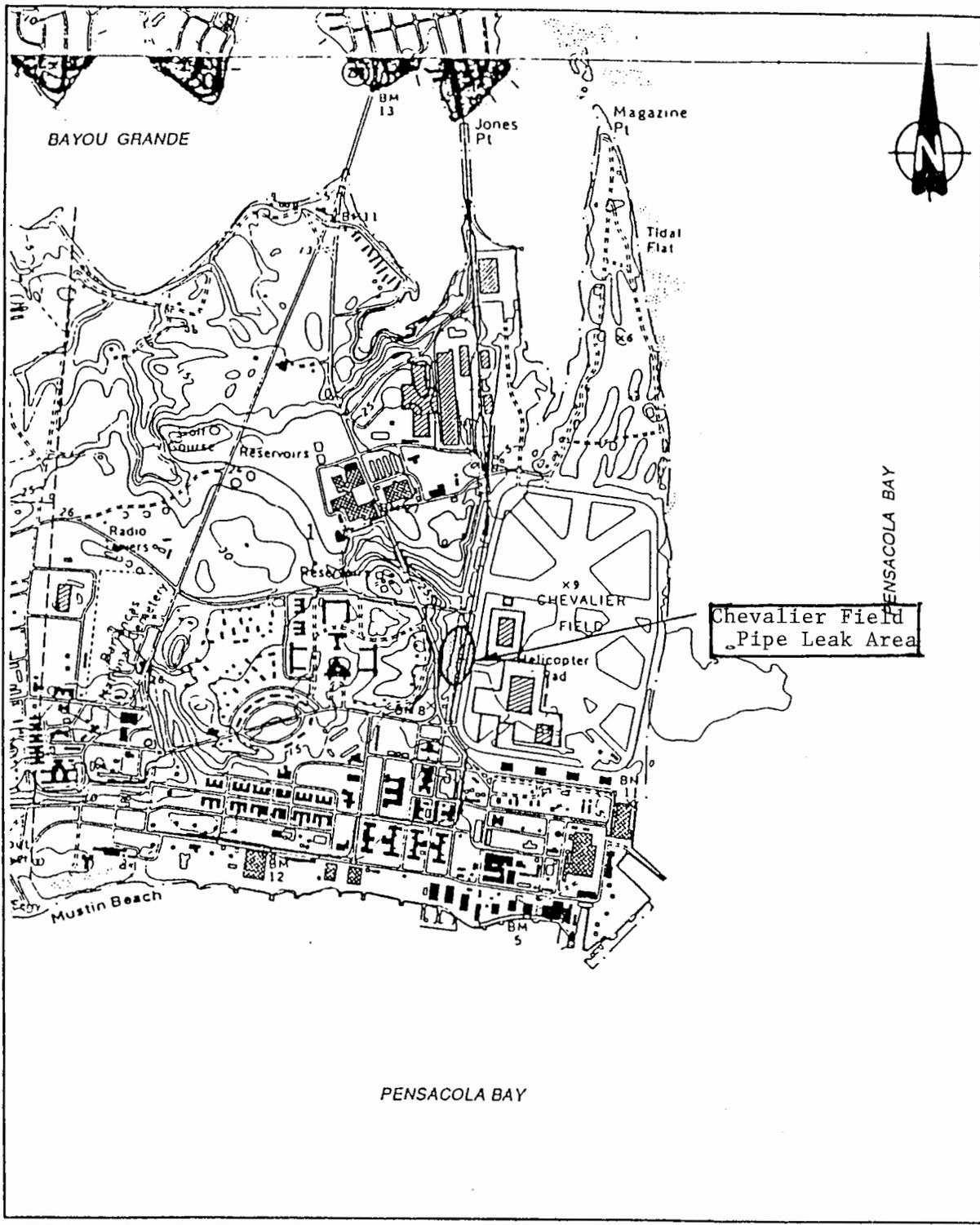
DRAWN BY: GAC  
DWG. NO.: BORDER  
REVISED BY:

REGIONAL LOCATION MAP OF PROJECT

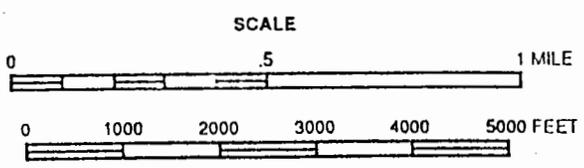
CLIENT: SOUTH AVFAFCENCOM, CHARLESTON, SC

SCALE IN STATUTE MILES

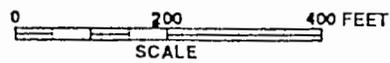
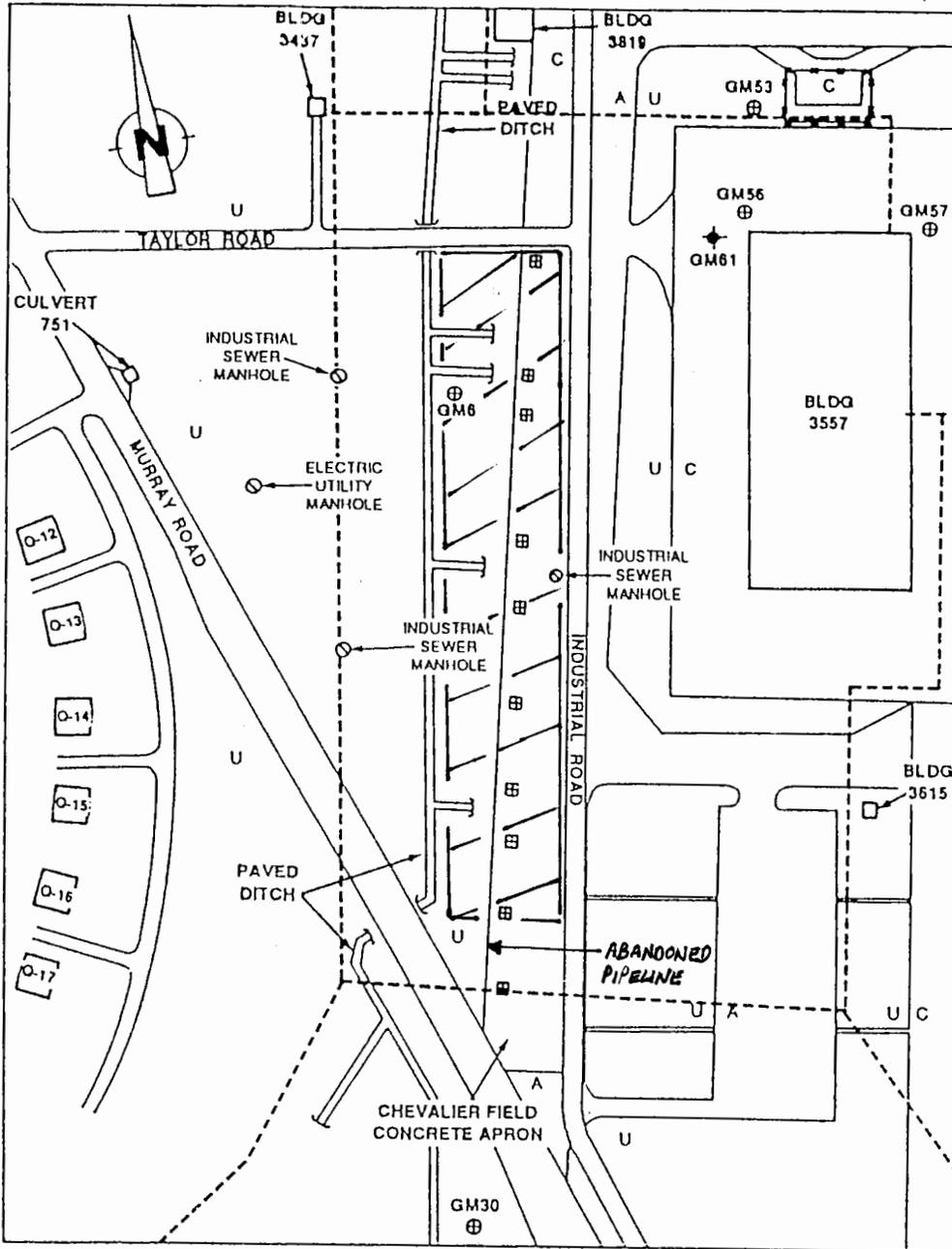




SOURCE: U.S.G.S. 7.5 Minute Series (Topographic) Quadrangles: Fort Barrancas, Fl. 1970 and West Pensacola, Fl. 1970, Photorevised 1987



NAVY PUBLIC WORKS CENTER PENSACOLA, FLORIDA		
SCALE: NTS	FIGURE	DRAWN BY: GAC
DATE: 12/14/95	1-2	CHKG NO: SITE
		REVISED BY:
Site Location Map- Chevalier Field Pipe Leak Area, NAS Pensacola		
CLIENT: SOUTH NAVYFACE/COMD. O WRESTON, SC		



**KEY:**

- ⊕ Existing Permanent Shallow Monitoring Well
- ⊕ Existing Permanent Deep Monitoring Well
- ⊕ Steel Grate
- BLDG 3557 Building
- O-12 Residential Quarters
- Fence
- A Asphalt Paved
- C Concrete Paved
- U Unpaved
- - - Industrial Waste Sewer Line (Site 36)
- ▨ SITE BOUNDARIES

NAVY PUBLIC WORKS CENTER PENSACOLA, FLORIDA		
SCALE: NTS	FIGURE 1-3	DRAWN BY: GAC DWG. NO: SITE REVISED BY:
Specific Site Location Map- Chevalier Field Pipe Leak Area, NAS, Pensacola		
CLIENT: SOUTHNAVFACENCOM, CHARLESTON, SC		

## **1.5 RESULTS OF PREVIOUS INVESTIGATIONS**

### **1.5.1 Verification Study and Phase I Fieldwork**

G&M conducted a Verification Study of the site and installed monitoring wells (GM6, GM7, GM29, and GM30). No VOCs were detected in the samples collected from the monitoring wells (G&M 1984). Phase I Fieldwork was conducted at IR Site 23 in 1991 by Ecology and Environment, Inc. (E&E). Fieldwork included 17 soil borings (B001 thru B017) and the installation of 8 temporary monitoring wells (TW001 thru TW008) (Figure 1-4).

OVA readings at the site indicated that the central area of the site appears to be a potential source of low levels of particulates in the air.

#### **15.1.1 Soil Investigation**

One or more of the site soil samples exhibited detectable levels of metals, total recoverable petroleum hydrocarbons (TRPHs), and polynuclear aromatic hydrocarbons (PAHs), and or phenols (Table 1-1). No volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs) or pesticides were detected in any soil samples collected at the site.

Concentrations of arsenic, chromium, zinc, lead, cadmium, nickel, copper, and silver were detected in soil samples collected at the site. Generally metal concentrations in soil samples were below the applicable RCRA PCALs. The highest concentrations and greatest variety of metals were observed in the southern portion of the site.

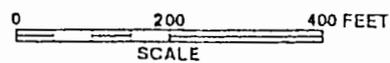
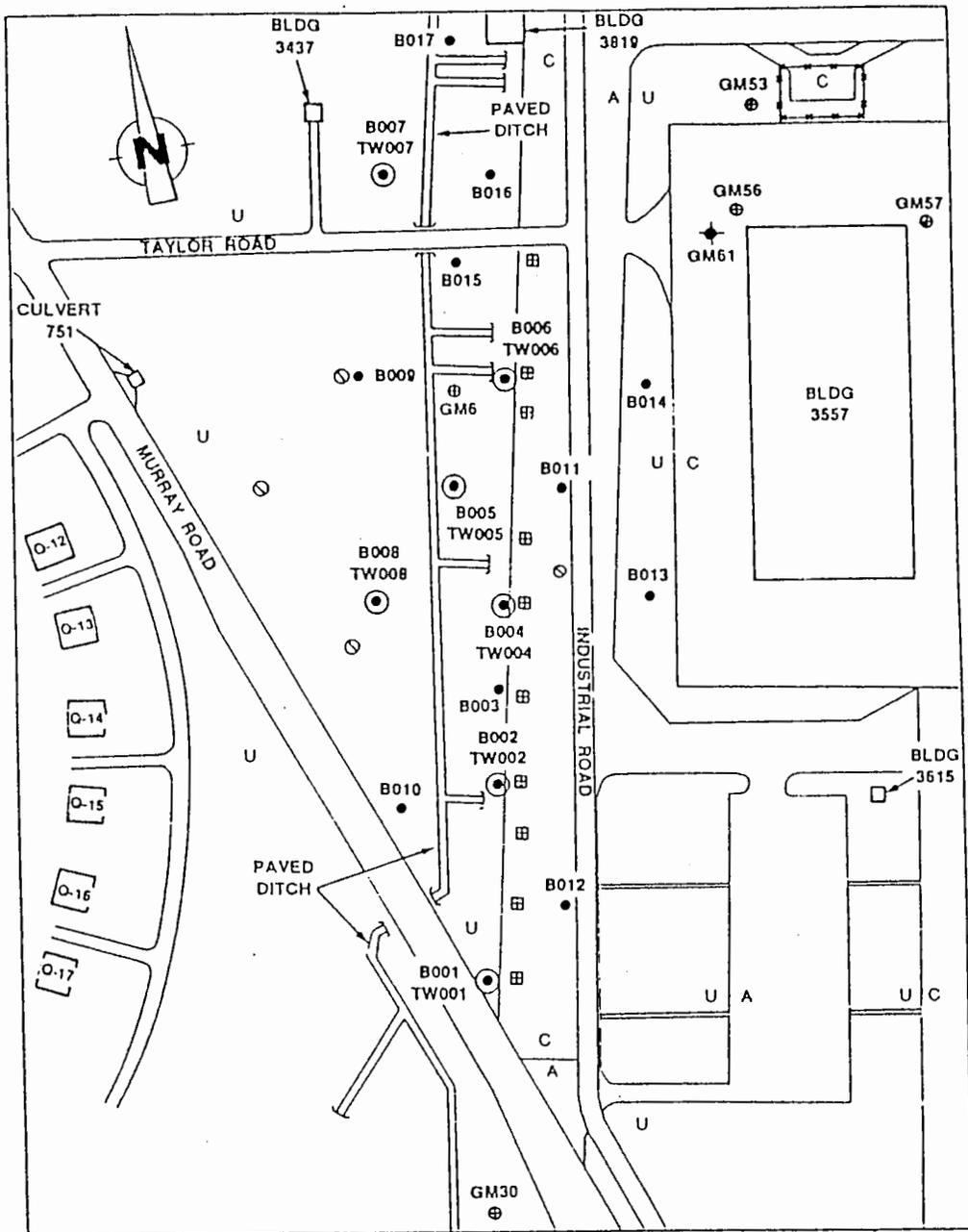
TRPHs were detected in soil samples collected from 10 of the 17 soil borings at the site, with concentrations ranging from 5.7 to 18,000 mg/kg. No VOCs were detected at the site. TRPH contamination appeared to be widespread across the north, south, and west portions of the site corresponding to the historical fuel pipe leaks.

Elevated PAH concentrations of 35,000 ug/kg and 6,5000 ug/kg were detected at the site at borings B008 and B001, respectively. PAH contamination was present in the south and west sections of the site. Phenols were detected only in boring B008.

#### **1.5.1.2 Groundwater Investigation**

The groundwater samples collected from Site 23 temporary monitoring wells, except TW007, exhibited concentrations of two or as many as eight metals (See Table 1-2). However, the elevated metals concentrations detected may in part reflect acid preservative leaching/dissolution of aquifer matrix sediments entrained in these unfiltered samples, rather than actual groundwater contamination. TRPHs and phenols were each detected in one of the temporary well groundwater samples. Trace levels of PAHs were detected in one of the temporary well samples.

Chromium and zinc were present in all but one of the temporary monitoring well groundwater samples. The chromium concentrations detected in three of these samples exceed the Florida



KEY:

- Soil Boring
- Temporary Monitoring Well
- ⊕ Existing Permanent Shallow Monitoring Well
- ◆ Existing Permanent Deep Monitoring Well
- ⊙ Manhole
- ⊠ Steel Grate
- BLDG 3557 Building
- Q-12 Residential Quarters
- Fence
- U Unpaved Area
- A Asphalt Paved Area
- C Concrete Paved Area

NAVY PUBLIC WORKS CENTER PENSACOLA, FLORIDA		
SCALE: NTS	FIGURE 1-4	DRAWN BY: GAC
DATE: 12/14/95		CHKG NO: SITE
		REVISED BY:
Soil Boring and Temporary Monitoring Well Locations		
CLIENT: SOUTH NAVY FAC/ENGR/CDR WALTER D. SC		

**TABLE 1-1**  
**SUMMARY ANALYTICAL SCREENING RESULTS FOR SOIL SAMPLES**  
**COLLECTED FROM CHEVALIER FIELD PIPE LEAK AREA**  
**B001A THRU B017A**  
**NAVAL AIR STATION PENSACOLA, SITE 23**

PARAMETER	SOIL BORING NUMBER <sup>1</sup>												
	Detection Limit	B001A	B001A*	B002A	B003A	B004A	B005A	B006A	B007A	B008A	B009A	B010A	RCRA PCAL
Arsenic (mg/kg)	6.0	8.0	---	---	---	---	---	---	---	---	---	---	80
Chromium (mg/kg)	1.0	180	5.6	---	---	---	---	---	---	---	---	---	400
Zinc (mg/kg)	2.0	340	300	5.9	3.5	---	3.1	3.6	---	2.3	4.2	19	16000
Lead (mg/kg)	4.0	190	500	---	---	---	10	---	8.8	9.6	15	29	
Cadmium (mg/kg)	0.5	1.2	0.96	---	---	0.85	---	---	---	---	---	---	40
Nickel (mg/kg)	4.0	5.1	4.1	---	---	---	---	---	---	---	---	---	2000
Copper (mg/kg)	2.5	150	110	---	---	---	---	---	---	---	---	4.9	2500
Silver (mg/kg)	1.0	1.0	---	---	---	---	---	---	---	---	---	---	200
TRPH's (mg/kg)	5.0	6.9	---	---	---	10	---	13	5.7	18000	---	20	
Total PAHS as Benzo-a-prene	1000	6000	6500	---	---	---	---	---	---	35000	---	---	
Phenols as Trichlorphenol	2000	---	---	---	---	---	---	---	---	59000	---	---	

NOTES: All Results in Micrograms/liter, unless noted.

<sup>1</sup> Soil Samples were composited at a depth interval approximately 0-5 feet below land surface at each soil boring location.

Dash (---) indicates compound not detected (L) = Present below stated detection limit.

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TABLE 1-1(CONT.)

PARAMETER	SOIL BORING NUMBER <sup>1</sup>								
	Detection Limit	B011A	B012A	B013A	B014A	B015A	B016A	B017A	RCRA PCAL
Arsenic (mg/kg)	6.0	----	----	----	----	6.4	----	----	80
Chromium (mg/kg)	1.0	----	----	4.1	4.4	----	1.5	8.1	400
Zinc (mg/kg)	2.0	2.0	4.2	4.6	5.2	----	2.6	2.1	16000
Lead (mg/kg)	4.0	----	----	9.3	8.5	----	----	----	
Cadmium (mg/kg)	0.5	----	----	----	----	----	----	0.90	40
Nickel (mg/kg)	4.0	----	----	----	----	----	----	----	2000
Copper (mg/kg)	2.5	----	----	----	----	----	----	----	2500
Silver (mg/kg)	1.0	----	----	----	----	----	----	----	200
TRPH's (mg/kg)	5.0	730	410	----	----	----	19	10	
Total PAHS as Benzo-a-prene	1000	----	----	----	----	----	----	----	
Phenols as Trichlorphenol	2000	----	----	----	----	----	----	----	

NOTES: All Results in Micrograms/liter, unless noted.

<sup>1</sup> Soil Samples were composited at a depth interval approximately 0-5 feet below land surface at each soil boring location.

Dash (----) indicates compound not detected

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**TABLE 1-2**  
**SUMMARY ANALYTICAL SCREENING RESULTS FOR GROUNDWATER SAMPLES**  
**(COLLECTED FROM TEMPORARY MONITORING WELLS)**  
**CHEVALIER FIELD PIPE LEAK AREA**  
**TW001 THRU TW008**  
**NAVAL AIR STATION PENSACOLA, SITE 23**

PARAMETER	TEMPORARY MONITORING WELL NUMBERS									
	Detection Limit	TW001	TW002	TW002D	TW004	TW005	TW006	TW007	TW008	FPDWS/ FSDWS
Arsenic	60	89	98	----	----	----	85	----	----	50
Chromium	10	210	20	13	68	84	20	----	22	50
Zinc	20	48000	220	240	360	530	93	----	61	5000
Lead	40	35000	340	460	390	270	----	----	----	50
Cadmium	5.0	110	----	----	----	6.7	----	----	----	10
Nickel	40	360	----	----	----	40	----	----	----	
Copper	25	10000	95	100	44	62	----	----	----	1000
Silver	10	57	----	----	----	----	----	----	----	50
TRPH's (mg/L)	1.0	----	----	----	----	----	----	----	4.9	
Total PAHS as Benzo-a-prene	100	----	----	----	----	----	----	----	(L)	
Phenols as Trichlorphenol	100	----	----	----	----	370	----	----	----	

NOTES: All Results in ug/L, unless noted.  
Dash (----) indicates compound not detected (L) = Present below stated detection limit.

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Primary Drinking Water Standard (FPDWS) of 50 micrograms per liter (ug/L; Florida Department of Environmental Regulations [FDER] 1991). On the other hand, the zinc concentration in only one of the samples exceeds the Florida Secondary Drinking Water Standard [FSDWS] of 5,000 ug/L (FDER 1991).

Lead was detected in five of the eight temporary well groundwater samples; these lead concentrations greatly exceed the FPDWS of 50 ug/L. Copper was detected in the five groundwater samples that exhibited lead; the copper concentration in only one sample (TW001) exceeds the FSDWS of 1,000 ug/L (FDER 1991).

The analytical results for the permanent monitoring well (GM6) groundwater samples are summarized in Table 1-3. These samples were analyzed for metals, TRPHs, VOCs, BNAs and PCBs.

A variety of metals were detected in the permanent monitoring well; however, no concentrations exceeded the FPDWSs. TRPHs were detected at a concentration of 1.6 mg/L. The presence of methylene chloride, acetone and bis(2-ethylhexyl) phthalate detected in samples was attributed to laboratory derived contamination. No PCBs were detected in any of the permanent monitoring well groundwater samples.

### **1.5.2 Underground Storage Tank Removal Sites 5, 6, and 7**

After Site 23 was removed from the IR Program List, three underground storage tanks (nos. 116, 119, and 122) associated with the aviation gasoline (AVGAS) pipeline were removed from the site by Phoenix Construction Company and GT Environmental Services Inc. (GTES) in 1994. All excavated soils were returned to the excavation. The UST sites (5, 6, and 7) were subsequently transferred to ABB Environmental Services, Inc. (ABB-ES) for closure and preliminary contamination assessment.

The Chevalier Field Pipe Leak Area was divided into three sub-sites corresponding to the USTs 116, 119, and 122, for the purpose of the closure and preliminary contamination assessment.

#### **1.5.2.1 Site 5 Investigations**

Site 5 is located on the west-central side of Chevalier Field at the former location of a 500 gallon underground storage tank (UST 116) associated with the aviation gasoline (AVGAS) pipeline (Figure 1-5). The tank was situated approximately 50 feet west of Industrial Boulevard and 370 feet south of Taylor Road. Five soil borings (05B001-05B005) were taken around the perimeter of the UST excavation area and used for a visual inspection of contamination (Figure 1-6). A composite soil sample (05B006) was collected from the soil returned to the Site 5 excavation area during tank removal. After contaminated soil was removed from the site in January 1995 by Bechtel Environmental Inc., four confirmatory soil samples (05B007-05B010) were collected from the north, west, south, and east sides of the excavation area (Figure 1-7). One temporary shallow monitoring well (05Z001) was installed at the site (Figure 1-8).

TABLE 1-3  
SUMMARY ANALYTICAL RESULTS FOR  
GROUNDWATER SAMPLES FROM PERMANENT MONITORING WELL  
CHEVALIER FIELD PIPE LEAK AREA, NAS PENSACOLA

Parameter	Detection Limit	Sample Number	
		P23W073 (GM6)	P23W060 <sup>a</sup> (GM6)
Methylene Chloride	5	6(B <sup>a</sup> )	5(B <sup>a</sup> )
Acetone	10	8(J)	10
Bis(2-Ethylhexyl) Phthalate	10	5(B <sup>a</sup> ,J)	5(B <sup>a</sup> ,J)
Aroclor - 1254	1.0	--	--
Tentatively Identified Compounds <sup>c</sup>			
Hexane		12(J)	6(J)
Unknown Siloxane		--	--
Dibutyl Phenol Isomer		7(J)	6(J)
Unknown Hydrocarbon		(5)37(J)	(4)37(J)
Unknown Compound		40(B <sup>a</sup> ,J)	61(B <sup>a</sup> ,J)
Unknown Compound		(4)63(J)	(5)65.7(J)
Total Alkalinity (mg/L as CaCO <sub>3</sub> )	1.0	30	30
Total Hardness (mg/L as CaCO <sub>3</sub> )	1.0	42	42
Total Organic Carbon (mg/L)	1.0	2.2	1.8
Total Metals			
Aluminum	14	471	551
Barium	5.0	5.4(B)	5.6(B)
Calcium	95	16,600	16,600
Iron	5.0	814(E)	1,040(E)
Lead	1.0	2.3(B)	2.9(B)
Magnesium	108	1,720(B)	1,740(B)
Manganese	1.0	4.8(B)	7.0(B)
Potassium	263	1,170(B)	1,240(B)
Sodium	74	4,840(B)	5,020
Zinc	3.0	5.2(B)	11.4(B)
Dissolved Metals			
Aluminum	14	57.4(B)	60.1(B)
Antimony	33	33.2(B)	--
Cadmium	3.0	4.2(B)	--
Calcium	95	16,500	16,600
Copper	2.0	2.1(B)	--
Iron	5.0	62.6(B,E)	55.3(B,E)
Lead	1.0	1.1(B)	--
Magnesium	108	1,680(B)	1,680(B)
Manganese	1.0	3.3(B)	3.7(B)
Nickel	8.0	--	--
Potassium	263	1,260(B)	1,260(B)
Sodium	74	4,940(B)	4,950(B)
Zinc	3.0	9.8(B)	9.3(B)
TRPHs (mg/L)	1.0	1.6	--

Key:

Dash (--) indicates compound not detected.

<sup>a</sup> Duplicate of sample P23W060.

<sup>b</sup> Analyzed for VOCs only.

<sup>c</sup> Analyzed for total metals, dissolved metals, cyanide, VOCs, BNAs, pesticides, PCBs, and TRPHs.

<sup>d</sup> Analyzed for dissolved metals, cyanide, VOCs, and TRPHs only.

<sup>e</sup> Values for TICs are estimated; no detection limits were established for TICs.

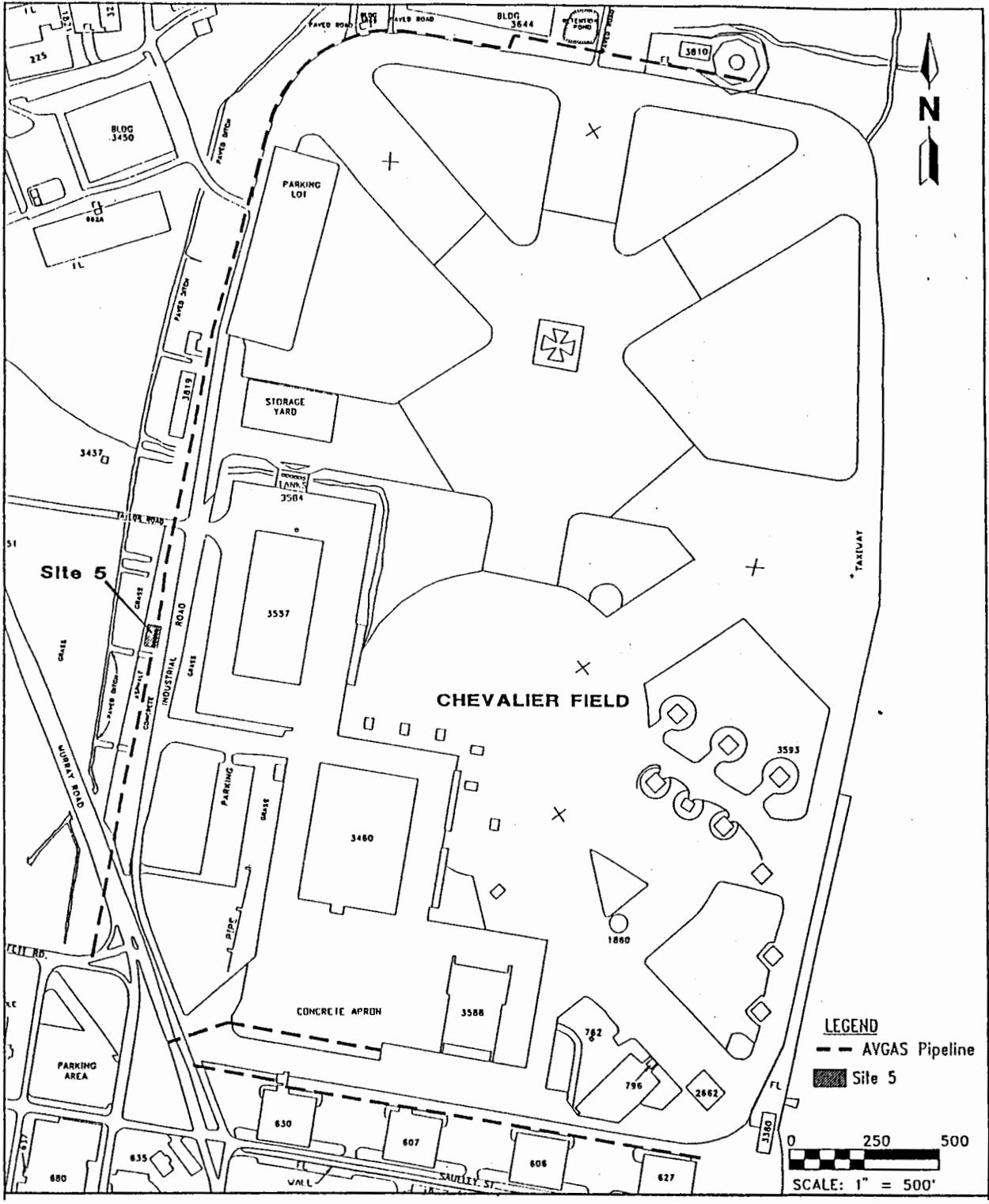
Qualifiers:

(B) = Reported value was obtained from a reading that was less than the Contract Required Detection Limit but greater than or equal to the Instrument Detection Limit.

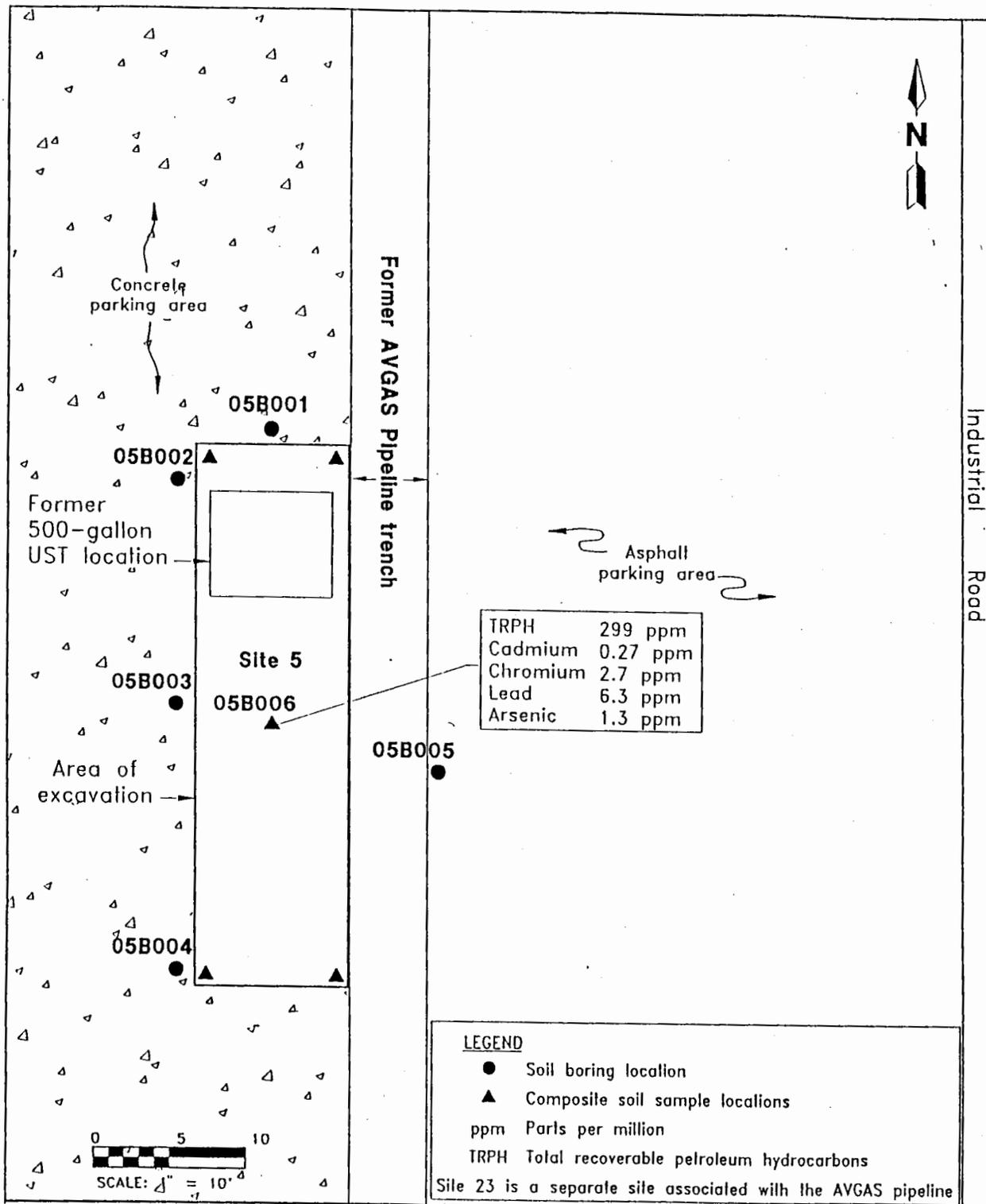
(B<sup>a</sup>) = Present in method blank.

(E) = Reported value is estimated because of the presence of interference.

(J) = For nonTICs estimated value; compound present but below detection limit. Also indicates that TIC concentrations are estimated because no detection limits were established.



NAVY PUBLIC WORKS CENTER PENSACOLA, FLORIDA		
SCALE: 1" = 20'	<b>FIGURE</b> 1-5	DRAWN BY: CAC
DATE: 10/31/95		CHG. NO: SITE
		REVISED BY:
<b>Site 5- Location Map</b>		
CLIENT: SOUTHNAVFACENCOM, CHARLESTON, SC		



TRPH	299 ppm
Cadmium	0.27 ppm
Chromium	2.7 ppm
Lead	6.3 ppm
Arsenic	1.3 ppm

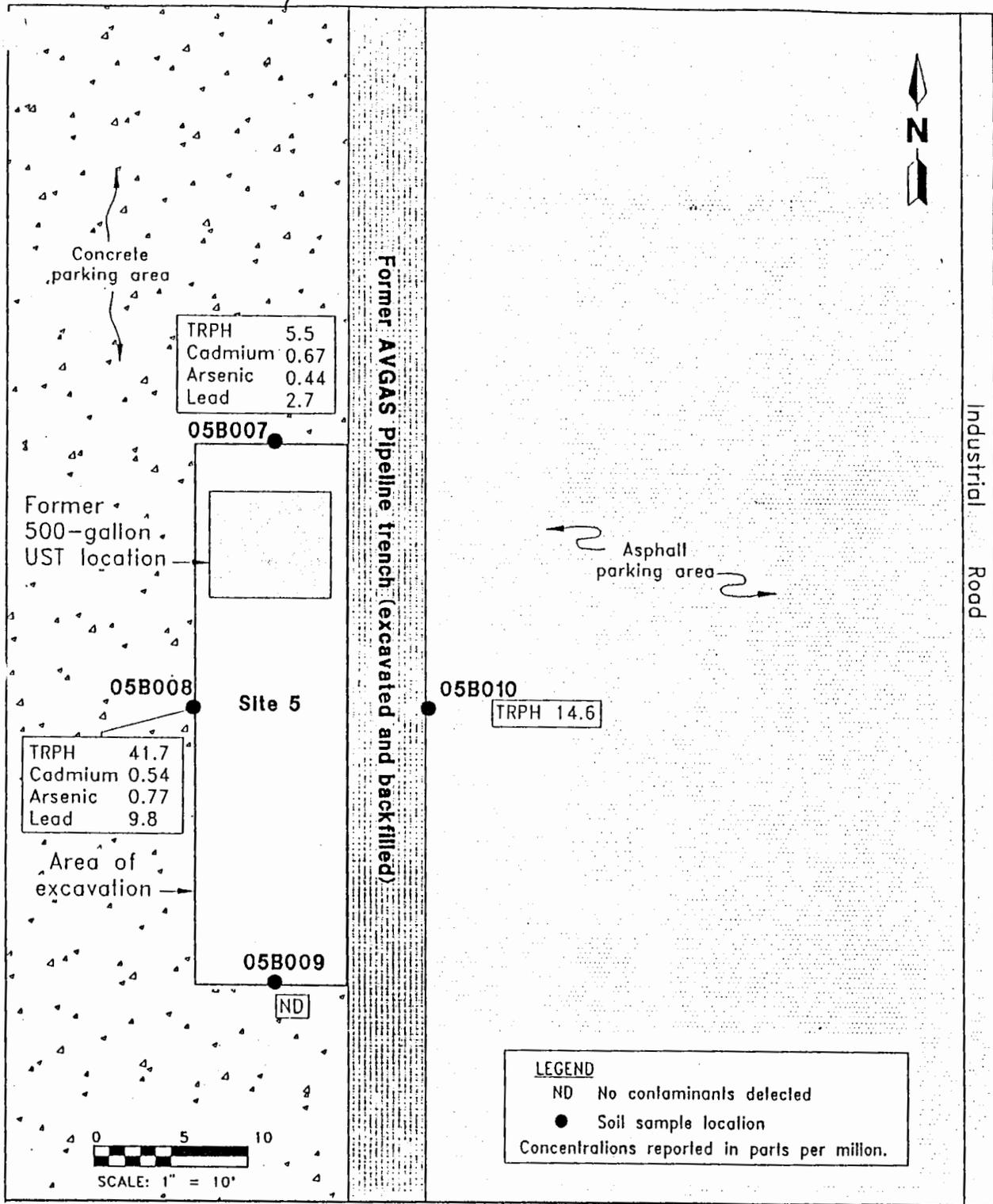
**LEGEND**

- Soil boring location
- ▲ Composite soil sample locations

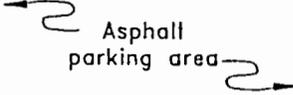
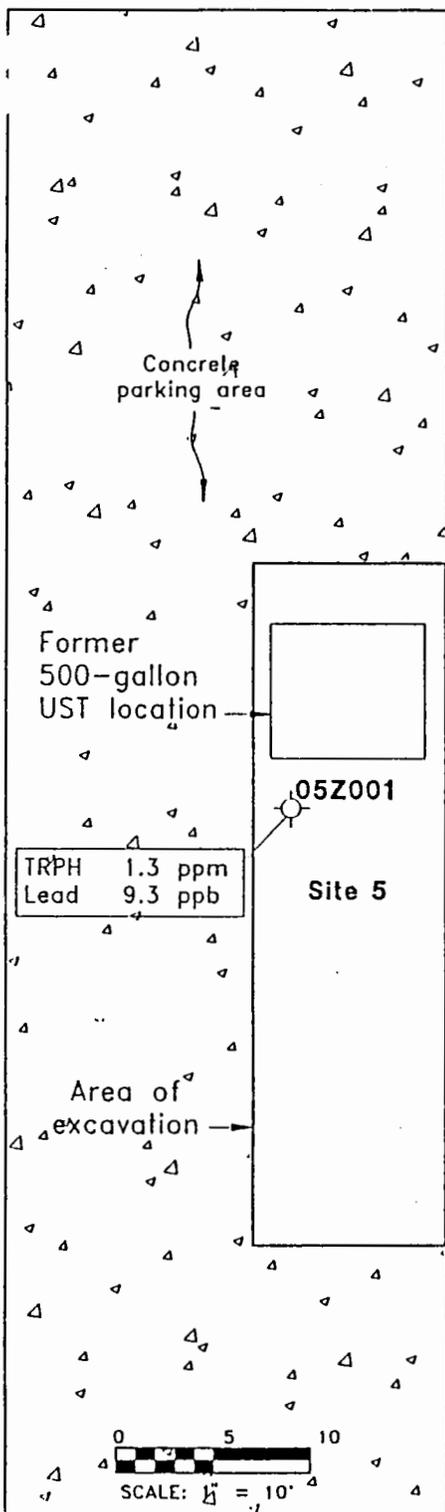
ppm Parts per million  
 TRPH Total recoverable petroleum hydrocarbons

Site 23 is a separate site associated with the AVGAS pipeline

NAVY PUBLIC WORKS CENTER PENSACOLA, FLORIDA		
SCALE: 1" = 20'	FIGURE 1-6	DRAWN BY: GAC
DATE: 10/31/95		DWG. NO.: SITE
Site 5- Soil Boring and Composite Sample Locations		REVISED BY:
CLIENT: SOUTHNAVFACENCOM, CHARLESTON, SC		



NAVY PUBLIC WORKS CENTER PENSACOLA, FLORIDA		
SCALE: 1" = 20'	FIGURE	DRAWN BY: GAC
DATE: 11/31/95	1-7	CHK. NO: SITE
		REVISED BY:
Site 5- Confirmatory Soil Sample Locations		
CLIENT: SOUTHNAVFACENCOM, CHARLESTON, SC		



Industrial Road

**LEGEND**

-  Temporary monitoring well location
- ppm Parts per million
- ppb Parts per billion
- TRPH Total recoverable petroleum hydrocarbons

NAVY PUBLIC WORKS CENTER PENSACOLA, FLORIDA		
SCALE: 1" = 20'	FIGURE	DRAWN BY: GAC
DATE: 10/31/95	1-8	CHG. NO: SITE
		REVISED BY:
Site 5- Temporary Monitoring Well Location		
CLIENT: SOUTHNAVFACENCOM, CHARLESTON, SC		

The results of the soil boring data is summarized in Table 1-4. Only 05B005 was saturated to the surface and had a slight sheen visible on the water surface. Volatile organic aromatic (VOA) and polynuclear aromatic hydrocarbon (PAH) concentrations were below method detection limits for soil sample 05B006. A total recoverable petroleum hydrocarbons (TRPH) concentration of 299 ppm was detected in 05B006. Because PAH and VOC concentrations were below detection limits, a TRPH clean soil maximum concentration of 50 ppm was applied according to Chapter 62-775.400, FAC. Chromium, arsenic, and lead concentrations were below their respective State-mandated maximum concentrations.

In January 1995, 26 cubic yards of excessively contaminated soil was removed from the site by Bechtel Environmental, Inc. and properly incinerated. In April 1995, confirmatory soil samples were collected and analyzed for TRPH, arsenic, cadmium, chromium, and lead. The results are presented in Table 1-5. No parameters detected in any of the four samples exceeded the Florida clean soil maximum concentrations.

The ground water sample from 05Z001 was analyzed for the Used Oil analytical group parameters in accordance with Chapter 62-770.600, FAC. No volatile or semi-volatile contaminants were detected. A TRPH concentration of 1.3 ppm was detected. The State Target Level for TRPH is 5 ppm. A lead concentration of 9.3 ppb was detected. The State Target Level for lead is 50 ppb. Two tentatively identified compounds (TICs) were detected: maleic hydrazide at 5 ppb and 2-amino-cyclopentanecarboxylic acid at 90 ppb. There are no regulatory target levels for these TICs. The results of groundwater analysis are included in Figure 1-4.

### **1.5.2.2 Site 6 Investigations**

Site 6 is located on the southwestern boundary of Chevalier Field at the former location of a 500 gallon underground storage tank (UST 119) associated with the aviation gasoline (AVGAS) pipeline (Figure 1-9). The tank was situated next to Industrial Boulevard and 700 feet south of Taylor Road and used for lubrication oil storage. Six soil borings (06B001-06B006) were taken around the perimeter of the UST excavation area and used for a visual inspection of contamination (Figure 1-10). OVA headspace measurements were collected from these borings. A composite soil sample (06B007) was collected from the soil returned to Site 6 excavation area during tank removal (Figure 1-11). After contaminated soil was removed from the site in February 1995 by Bechtel Environmental Inc., seven confirmatory soil samples (06B008-06B0014) were collected around the excavation area (Figure 1-12). Eight temporary shallow monitoring wells (06G001 and 06G003-06G009) and one deep vertical extent monitoring well were installed at the site (Figure 1-13).

The results of the soil boring and OVA data is summarized in Table 1-6. No staining and no petroleum odors were detected at any of the borings. Volatile organic compound concentrations were less than the OVA detection limit of 1 ppm. Total volatile organic aromatics (VOA) and total polynuclear aromatic hydrocarbon (PAH) concentrations were below method detection limits for 06B007. A total recoverable petroleum hydrocarbons (TRPH) concentration of 106 ppm was detected in 05B006. Because PAH and VOC concentrations were below detection limits, a TRPH clean soil maximum concentration of 50 ppm was applied according to Chapter

**Table 1-4**  
**Summary of Lithologic Soil Boring Data,**  
**September and October 1994**

Contamination Assessment Report Addendum  
Site 5, Underground Storage Tank 116  
Naval Aviation Depot  
Pensacola, Florida

Soil Boring Designation	Sample Depth (feet bls)	Physical Observations
05B001	0.4 to 1.5	Stained soil, no petroleum odor
05B002	0.4 to 2.0	No staining, no petroleum odor
05B003	0.4 to 1.5	No staining, no petroleum odor
05B004	0.4 to 1.5	No staining, no petroleum odor
05B005	0.5 to 1.5	Saturated to surface, slight sheen visible on water

Note: bls = below land surface .

**Table 1-5**  
**Summary of Soil Sample Analytical Results**  
**October 1994 through April 1995**

Contamination Assessment Report Addendum  
 Site 5, Underground Storage Tank 116  
 Naval Aviation Depot  
 Pensacola, Florida

Contaminant	Soil Sample Designation					Clean Soil <sup>1</sup> Maximum Concentration
	05B00601	05B00702 <sup>2</sup>	05B00802	05B00902	05B01002	
<b>Volatile organic aromatics (VOA). Reported in parts per billion (ppb).</b>						
Total VOA	BDL	NS	NS	NS	NS	100
<b>Polynuclear aromatic hydrocarbons (PAH). Reported in ppb.</b>						
Total PAH	BDL	NS	NS	NS	NS	1000
<b>Total recoverable petroleum hydrocarbons (TRPH). Reported in parts per million (ppm).</b>						
TRPH	299	5.5	41.7	<5.8	14.6	50 <sup>3</sup>
<b>Total metals. Reported in milligrams per kilogram (mg/kg).</b>						
Cadmium	0.27 J	0.67	0.54	<0.58	<0.60	37
Chromium	2.7 J	<2.7	<2.7	<2.9	<3.0	50
Arsenic	1.3	0.44	0.77	<0.29	<0.30	10
Lead	6.3	2.7	9.8	<2.9	<3.0	108

<sup>1</sup>Chapter 62-775.400 Florida Administrative Code.

<sup>2</sup>Concentrations presented in this column are from sample 05B00702 and its duplicate 05B00702D. The highest concentration detected is reported.

<sup>3</sup>Provided total polynuclear aromatic hydrocarbons (PAH) does not exceed 100 parts per billion (ppb) and total volatile organic halocarbons (VOH) do not exceed 50 ppb. In all other cases the total recoverable petroleum hydrocarbons (TRPH) maximum concentration is 10 parts per million (ppm) (Chapter 62-775.400).

Notes: Total VOA = the sum concentration of benzene, toluene, ethylbenzene, and xylenes.

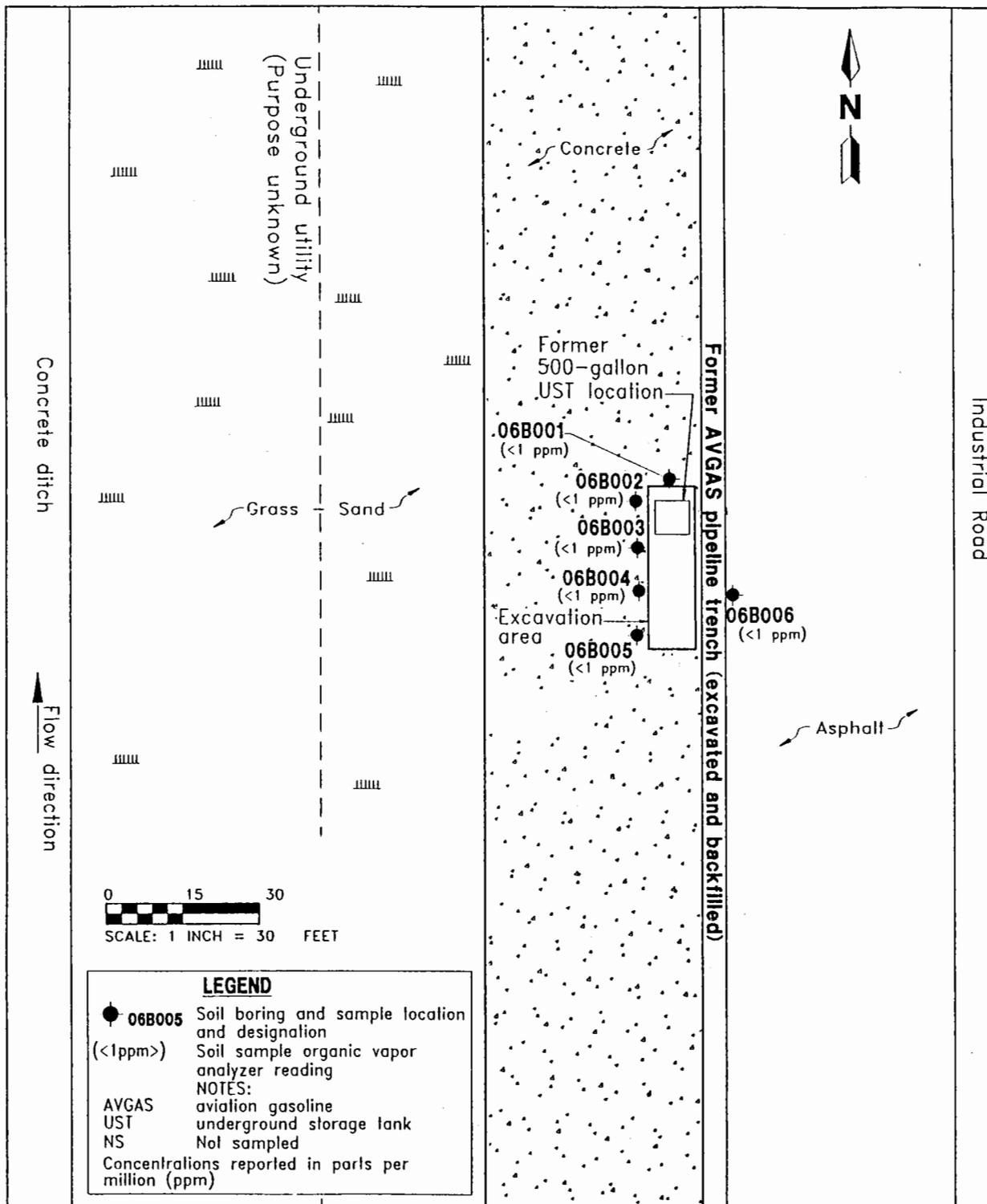
Total PAH = the sum concentration of PAH compounds detected by USEPA Method 8270A.

NS = not sampled.

BDL = below detection limits.

USEPA = United States Environmental Protection Agency



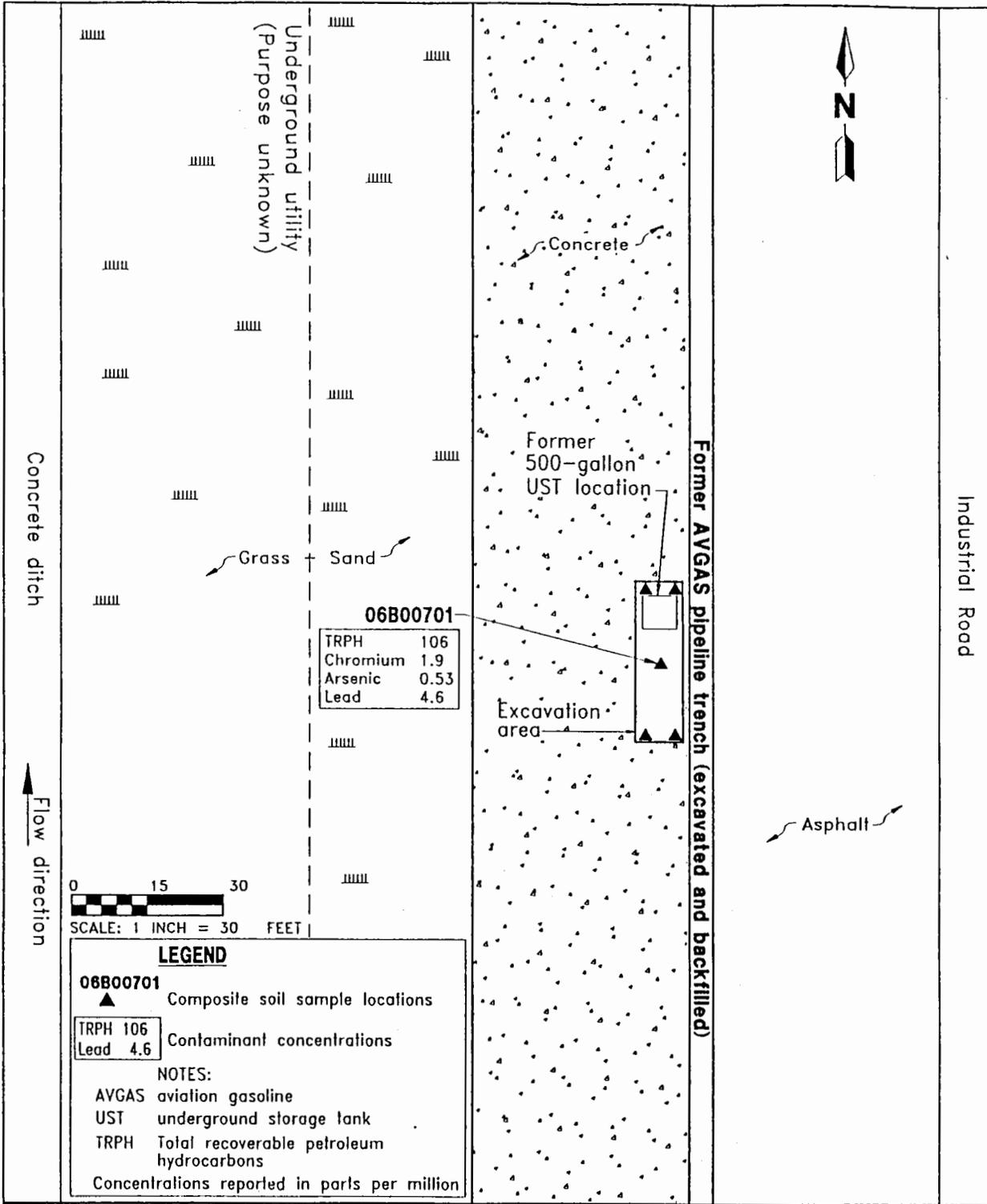


**LEGEND**

● 06B005 Soil boring and sample location and designation  
 (<1ppm) Soil sample organic vapor analyzer reading

NOTES:  
 AVGAS aviation gasoline  
 UST underground storage tank  
 NS Not sampled  
 Concentrations reported in parts per million (ppm)

NAVY PUBLIC WORKS CENTER PENSACOLA, FLORIDA		
SCALE: NTS	FIGURE 1-10	DRAWN BY: GAC
DATE: 12/14/95		CHKG NO: SITE
REVISED BY:		
Site 6- Soil Boring Locations		
CLIENT: SOUTH NAVY AFB/CGM, CHARLESTON, SC		



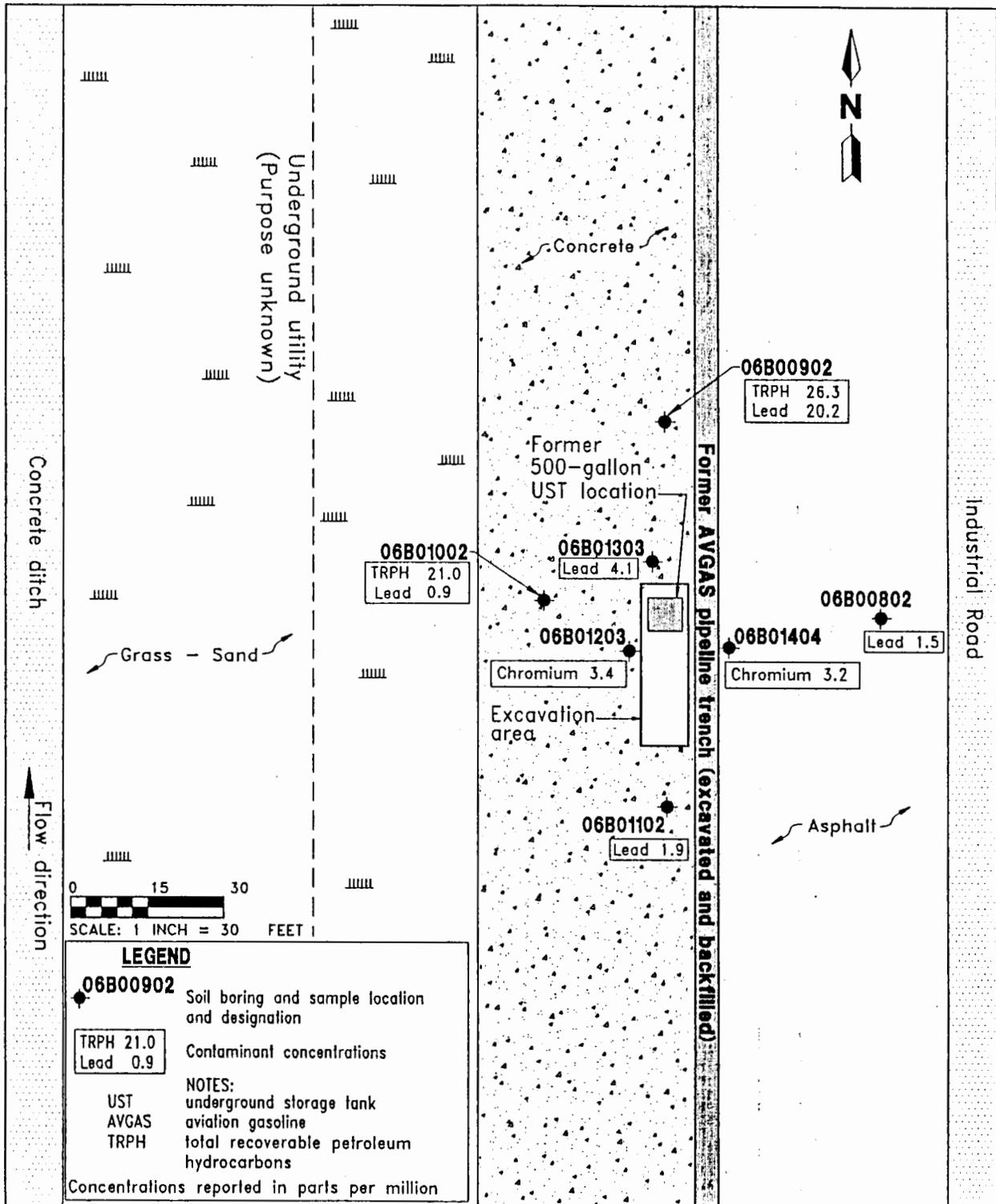
**LEGEND**

**06B00701**  
▲ Composite soil sample locations

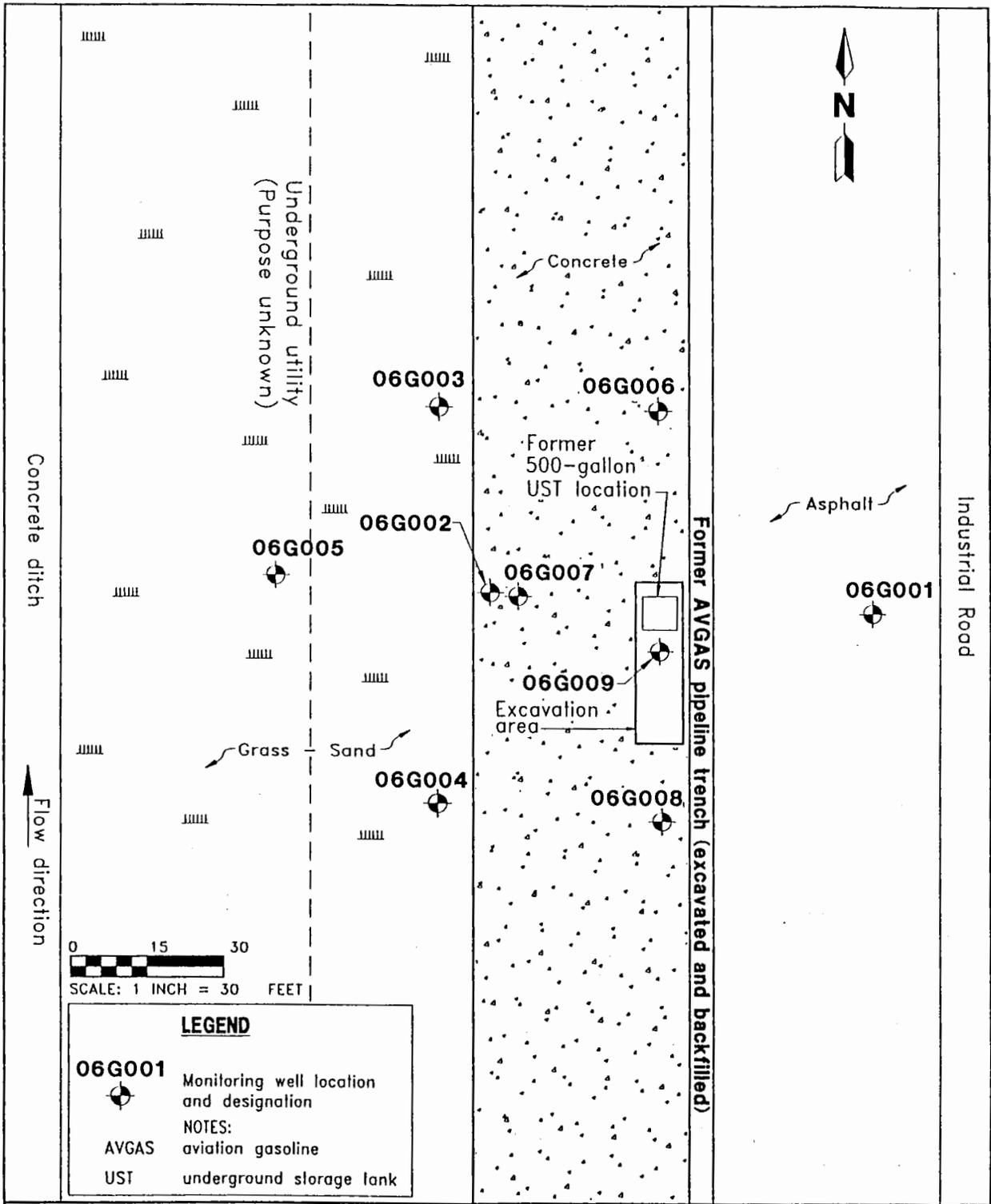
TRPH 106	Contaminant concentrations
Lead 4.6	

NOTES:  
 AVGAS aviation gasoline  
 UST underground storage tank  
 TRPH Total recoverable petroleum hydrocarbons  
 Concentrations reported in parts per million

NAVY PUBLIC WORKS CENTER PENSACOLA, FLORIDA		
SCALE: NTS	<b>FIGURE</b> 1-11	DRAWN BY: GAC
DATE: 12/14/95		CHG. NO: SITE
REVISED BY:		
Site 6- Composite Sample Location		
CLIENT: SOUTHNAVFACENGCOM, CHARLESTON, SC		



NAVY PUBLIC WORKS CENTER PENSACOLA, FLORIDA		
SCALE: NTS	<b>FIGURE</b>	DRAWN BY: GAC
DATE: 12/14/95	1-12	DWG. NO: SITE
		REVISED BY:
Site 6- Confirmatory Soil Sample Locations		
CLIENT: SOUTH-NAVFACENGCOM, CHARLESTON, SC		



**LEGEND**

**06G001**  Monitoring well location and designation

NOTES:

AVGAS aviation gasoline

UST underground storage tank

NAVY PUBLIC WORKS CENTER PENSACOLA, FLORIDA		
SCALE: NTS	<b>FIGURE</b> 1-13	DRAWN BY: GAC
DATE: 12/14/95		ENG. NO.: SITE REVISED BY:
Site 6- Temporary Monitoring Well Locations		
CLIENT: SOUTHNAVFACENCOM, CHARLESTON, SC		

**Table 1-6  
Summary of Soil Boring Organic Vapor Analyzer Data**

Contamination Assessment Report Addendum  
Site 6, UST 119, Naval Aviation Depot  
Pensacola, Florida

Soil Boring Designation	Sample Depth (feet bls)	Unfiltered OVA Reading <sup>1</sup> (ppm)	Visual Observations
06B001	0.4 to 0.7	<1	No staining, no petroleum odor
06B002	0.4 to 0.7	<1	No staining, no petroleum odor
06B003	0.4 to 0.7	<1	No staining, no petroleum odor
06B004	0.7 to 1.2	<1	No staining, no petroleum odor
06B005	0.5 to 0.7	<1	No staining, no petroleum odor
06B006	0.5 to 1.0	<1	No staining, no petroleum odor

<sup>1</sup> Filtered readings were not taken due to the very low volatile concentrations encountered at Site 6.

Notes: UST = underground storage tank.  
OVA = organic vapor analyzer.  
bls = below land surface.  
ppm = parts per million.  
< = less than.

62-775.400, FAC. Chromium, arsenic, and lead concentrations were below their respective State-mandated maximum concentrations. The analytical results for the composite soil sample are included in Figure 1-11.

In February 1995, 24 cubic yards of excessively contaminated soil was removed from the site by Bechtel Environmental, Inc. and properly incinerated. In February and Jun 1995, seven confirmatory soil samples were collected and analyzed for TRPH, arsenic, cadmium, chromium, and lead. The results are presented in Table 1-7. TRPH concentrations of 26.3 ppm and 21.0 ppm were detected in 06B009 and 06B010, respectively. Chromium concentrations of 3.4 ppm and 3.2 ppm were detected in samples 06B012 and 06B014, respectively. Lead concentrations ranging from 1.5 ppm to 20.2 ppm were detected. The concentrations of all contaminant detected were below the State maximum concentrations listed in Chapter 170775-400, FAC. Cadmium and arsenic were not detected in any of the confirmatory samples.

The ground water samples were analyzed for the used oil analytical group parameters in accordance with Chapter 62-770.600, FAC. No volatile or semi-volatile contaminants were detected. TRPH and cadmium concentrations were below detection limits. Arsenic concentrations of 32.8 ppb, 21.7 ppb, and 18.4 ppb were detected in 06G001, 06G004, and 06G008, respectively. The State Target Level for arsenic is 50 ppb. Chromium concentrations of 154 ppb, 101 ppb, and 66.7 ppb were detected in 06G001, 06G004, and 06G008, respectively. The state MCL for chromium is 100 ppb (Table 1-8) Tentatively identified compounds (TICs) detected are summarized in Table 1-9. There are no regulatory target levels for TICS.

### **1.5.2.3 Site 7 Investigations**

Site 7 is located on the western boundary of Chevalier Field at the former location of a 500-gallon underground storage tank (UST 122) associated with the aviation gasoline (AVGAS) pipeline (Figure 1-14). The tank was situated 60 feet west of Industrial Boulevard and 150 feet north of Murray Road and used for lubrication oil storage. Five soil borings (07B001-07B005) were taken around the perimeter of the UST excavation area and used for a visual inspection of contamination. OVA headspace measurements were collected from these borings. A composite soil sample (07B006) was collected from the soil returned to the Site 7 excavation area during tank removal (Figure 1-15). After contaminated soil was removed from the site in February 1995 by Bechtel Environmental Inc., five confirmatory soil samples (07B007-07B011) were collected around the excavation area (Figure 1-16). One temporary shallow monitoring well (07Z001) was installed at the site (Figure 1-17).

The results of the soil boring and OVA data is summarized as Table 1-9. Staining was detected at 07B001, but no petroleum odors were detected at any of the borings. Volatile organic compound concentrations were less than the OVA detection limit of 1 ppm. Total volatile organic aromatics (VOA) and total polynuclear aromatic hydrocarbon (PAH) concentrations were below method detection limits for 07B001. A total recoverable petroleum hydrocarbons (TRPH) concentration of 31.4 ppm was detected in 07B006. Because PAH and VOC concentrations were below detection limits, a TRPH clean soil maximum concentration of 50 ppm was applied according to Chapter 62-775.400, FAC. Cadmium, chromium and arsenic

**Table 1-7  
Summary of Soil Sample Analytical Results,  
October 1994 through February 1995**

Contamination Assessment Report Addendum  
Site 6, UST 119, Naval Aviation Depot  
Pensacola, Florida

Contaminant	Soil Sample Designation								Clean Soil <sup>1</sup> Maximum Concentration
	06B00701	06B00802	06B00902	06B01002	06B01102	06B01203	06B01303	06B01404	
<b>Volatile Organic Aromatics (VOA). Reported in parts per billion (ppb).</b>									
Total VOA	bdl	NS	100						
<b>Polynuclear Aromatic Hydrocarbons (PAH). Reported in ppb.</b>									
Total PAH	bdl	NS	1000						
<b>Total Recoverable Petroleum Hydrocarbons (TRPH). Reported in parts per million (ppm).</b>									
TRPH	106	<6.1	26.3	21.0	<6.2	<5.7	<5.8	<5.6	<sup>2</sup> 50
<b>Total Metals. Reported in milligrams per kilogram (mg/kg).</b>									
Cadmium	<0.54	<0.61	<0.62	<0.61	<0.62	<0.57	<0.58	<0.56	37
Chromium	1.9 J	<3.1	<3.1	<3.1	<3.1	3.4	<2.9	3.2	50
Arsenic	0.53	<0.31	<0.31	<0.31	<0.31	<9.1	<9.2	<8.9	10
Lead	4.6	1.5	20.2	0.90	1.9	<2.8	4.1	<2.8	108

<sup>1</sup> Chapter 62-775.400, Florida Administrative Code.

<sup>2</sup> Provided total PAH do not exceed 100 ppb and total volatile organic halocarbons (VOH) do not exceed 50 parts per billion (ppb). In all other cases the TRPH maximum concentration is 10 ppm (Chapter 62-775.400, FAC).

Notes: UST = underground storage tank.

Total VOA = the sum concentration of benzene, toluene, ethylbenzene, and xylenes.

bdl = below detection limits.

NS = not sampled.

Total PAH = the sum concentration of PAH compounds detected by U.S. Environmental Protection Agency (USEPA) Method 8270A.

< = less than.

J = estimated value.

**Table 1-8  
Summary of Groundwater Analytical Results,  
March and May 1995**

Contamination Assessment Report Addendum  
Site 6, UST 119, Naval Aviation Depot  
Pensacola, Florida

Contaminant	Groundwater Sample Designation							State Target Levels <sup>1</sup>
	06G00101	06G00102	06G00201	06G00301	06G00302	06G00401	06G00402	
<b>Volatile Organic Compounds. Reported in parts per billion (ppb).</b>								
Benzene	<1.0	NA	<1.0	<1.0	NA	<1.0	NA	1
Total VOA	<4.0	NA	<4.0	<4.0	NA	<4.0	NA	50
<b>Total Recoverable Petroleum Hydrocarbons (TRPH). Reported in parts per million (ppm).</b>								
TRPH	<1.0	NA	<1.0	<1.0	NA	<1.0	NA	5
<b>Total Metals. Reported in ppb.</b>								
Total arsenic	32.8	<5.0	<5.0	<5.0	<5.0	21.7	<5.0	50
Chromium	154	<50.0	<50.0	<50.0	<50.0	101	<50.0	100
Total lead	168	<5.0	<5.0	22.5	<5.0	177	<5.0	50
See notes at end of table.								

**Table 1-9  
Summary of Lithologic Soil Boring Data,  
September and October 1994**

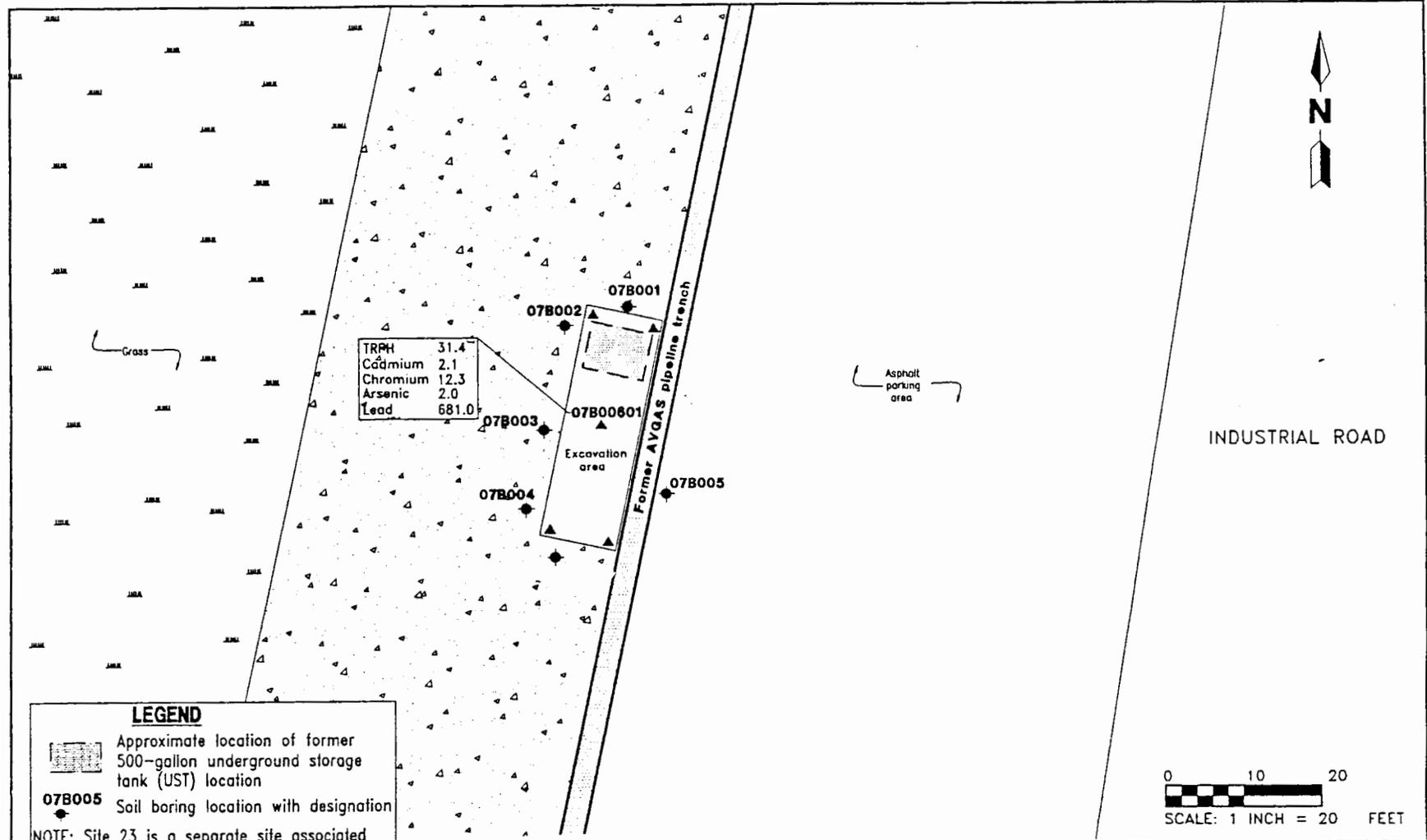
Contamination Assessment Report Addendum  
Site 7, UST 122, Naval Aviation Depot  
Pensacola, Florida

Soil Boring Designation	Sample Depth (feet bls)	Unfiltered OVA Headspace Reading <sup>1</sup>	Visual Observations
07B001	0.5 to 1.0	<1	Soil staining, no petroleum odor
07B002	0.5 to 1.0	<1	No staining, no petroleum odor
07B003	0.5 to 1.0	<1	No staining, no petroleum odor
07B004	0.5 to 1.0	<1	No staining, no petroleum odor
07B005	0.3 to 0.7	1	No staining, no petroleum odor

<sup>1</sup> Filtered readings were not taken due to the very low volatile concentrations encountered at the sites.

Notes: UST = underground storage tank.  
OVA = organic vapor analyzer.  
bls = below land surface.  
< = less than.





**LEGEND**

Approximate location of former 500-gallon underground storage tank (UST) location

**07B005** Soil boring location with designation

**NOTE:** Site 23 is a separate site associated with the AVGAS pipeline. Concentrations are reported in parts per million.

TRPH Total recoverable petroleum hydrocarbons

Contaminant concentration

AVGAS Aviation gasoline

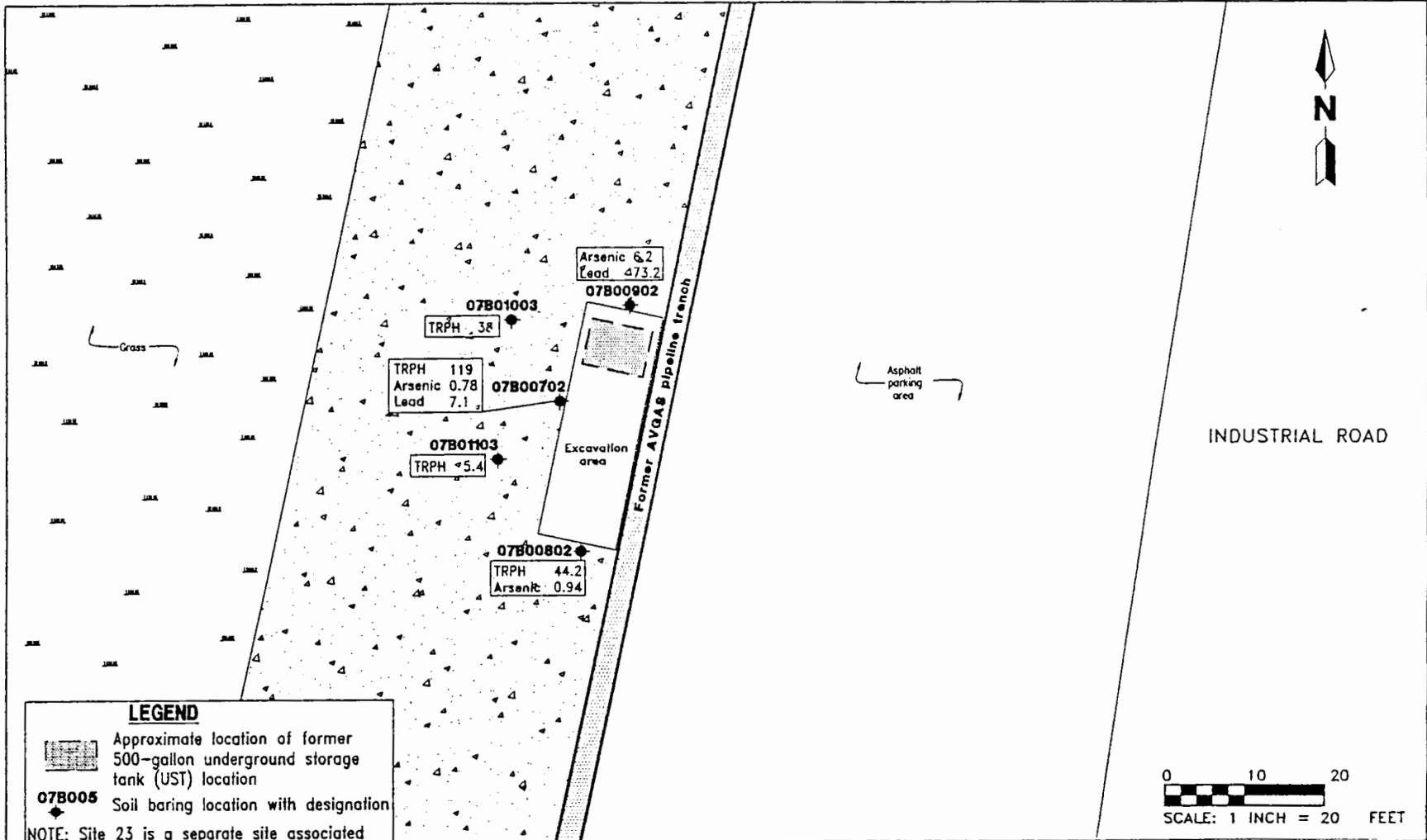
NADEP Naval Aviation Depot

NAVY PUBLIC WORKS CENTER  
PENSACOLA, FLORIDA

SCALE:	FIGURE	DRAWN BY: GAC
DATE: 10/31/95	1-15	CHKG. NO.: DVA
		REVISED BY:

**Site 7- Soil Boring Locations**

CLIENT: SOUTH-HAVFACE/CDOP, CHARLESTON, SC



**LEGEND**

Approximate location of former 500-gallon underground storage tank (UST) location

**07B005** Soil boring location with designation

**NOTE:** Site 23 is a separate site associated with the AVGAS pipeline. Concentrations are reported in parts per million.

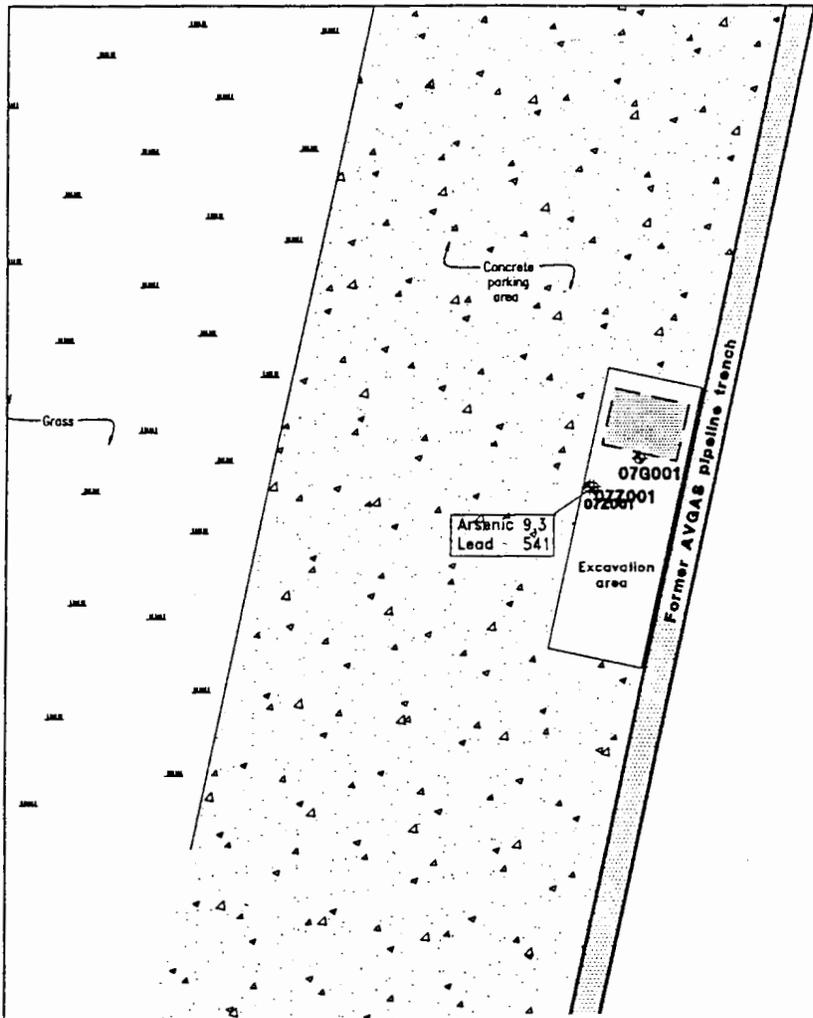
TRPH Total recoverable petroleum hydrocarbons

Contaminant concentration

AVGAS Aviation gasoline

NADEP Naval Aviation Depot

NAVY PUBLIC WORKS CENTER PENSACOLA, FLORIDA		
SCALE:	FIGURE	DRAWN BY: GAC
DATE: 10/15/95	1-16	CHK. NO: OVA
REVISED BY:		
Site 7- Confirmatory Soil Sample Locations		
CLIENT: SOUTH NAVY FAC ENGINEER, CHARLESTON, SC		



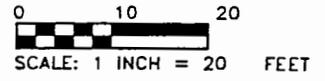
INDUSTRIAL ROAD

**LEGEND**

- Approximate location of former 500 gallon underground storage tank location
- Approximate extent of excessive TRPH contamination
- 07B005** Soil boring location with designation
- 07G001** Monitoring well location with designation

**NOTE:** Concentrations reported in parts per million.

UST      Underground Storage Tanks  
 NADEP    Naval Aviation Depot  
 AVGAS    Aviation gasoline  
 TRPH     Total recoverable petroleum hydrocarbons



NAVY PUBLIC WORKS CENTER PENSACOLA, FLORIDA		
SCALE:	FIGURE	DRAWN BY: GAC
DATE: 10/31/95	1-17	DWG. NO: OVA
		REVISED BY:
Site 7- Temporary		
<u>Monitoring Well Location</u>		
CLIENT: SOUTHNAVFACENCOM, CHARLESTON, SC		

concentrations were below their respective State-mandated maximum concentrations. A lead concentration of 681 ppm was detected in 07B006 (Table 1-10). The state maximum concentration for lead in soil is 108 ppm. The composite soil sample results are included in Figure 1-15.

In February 1995, 17 cubic yards of excessively contaminated soil were removed from the site by Bechtel Environmental, Inc. and properly incinerated. In April 1995, three confirmatory soil samples were collected and analyzed for TRPH, arsenic, cadmium, chromium, and lead. The results are presented in Table 1-10. TRPH concentrations of 119 ppm was detected in 07B002, exceeding the State clean soil maximum concentration of 50 ppm. No other parameters detected in the soil samples exceeded Florida's clean soil maximum concentrations (Table 1-11).

The ground water sample was analyzed for the Used Oil analytical group parameters in accordance with Chapter 62-770.600, FAC. No volatile or semi-volatile contaminants were detected. No TRPH concentrations were detected. Cadmium and chromium concentrations were below method detection limits. An arsenic concentration of 9.3 ppb, and a lead concentration of 541 ppb were detected. The State Target Level for arsenic and lead is 50 ppb. Chromium concentrations of 154 ppb, 101 ppb, and 66.7 ppb were detected. Four tentatively identified compounds (TICs) were detected. There are no regulatory target levels for TICs (Table 1-12).

## **1.6 REGIONAL GEOLOGY AND HYDROGEOLOGY**

NASP is located in the Gulf Coastal Lowland Subdivision of the Coastal Plain Province physiographic division (Brooks 1981). NASP is located on a peninsula bounded on the east and south by Pensacola Bay and Big Lagoon and on the north by Bayou Grande. The most prominent topographic feature on the peninsula is an escarpment or bluff which parallels the southern and eastern shorelines and on which Fort Barrancas was built. Seaward of the escarpment is a nearly level marine terrace with surface elevations of approximately 5 feet above mean sea level (MSL). The central part of the peninsula, located landward of the escarpment, is a broad, gently rolling upland area with surface elevations up to 40 feet MSL (USGS 1970a, 1970b). Sandy soils occur throughout the NAS Pensacola area. As a result, most of the rainfall infiltrates directly into the subsurface. Consequently, there are few streams or surface water bodies on the peninsula.

There are three principal hydrogeologic units of importance which underlie NASP. These are, in descending order, the Surficial Aquifer, the Intermediate System, and the Floridan Aquifer System.

The Surficial Aquifer occurs from land surface to a depth of approximately 300 feet at NASP and is composed of a sequence of unconsolidated to poorly indurated clastic deposits (Wagner *et al.* 1984). In this portion of Florida, the Surficial Aquifer constitutes an important source of water supply and is called the Sand-and-Gravel Aquifer (Southeastern Geological Society [SEGS] 1986). In the NASP vicinity, the Sand-and-Gravel Aquifer is made up of three zones based on contrasting permeabilities. These zones are referred to as the surficial zone, the low permeability zone, and the main producing zone (Wilkins *et al.* 1985).

**Table 1-10  
Summary of Soil Sample Analytical Results,  
October 1994 through April 1995**

Contamination Assessment Report Addendum  
Site 7, UST 122, Naval Aviation Depot  
Pensacola, Florida

Contaminant	Soil Sample Designation						Clean Soil Maximum Concentration <sup>1</sup>
	<sup>2</sup> 07B00601	07B00702	07B00802	<sup>3</sup> 07B00902	07B01003	07B01103	
<b>Volatile Organic Aromatics (VOA). Reported in parts per billion (ppb).</b>							
Total VOA	bdl	NS	NS	NS	NS	NS	100
<b>Polynuclear Aromatic Hydrocarbons (PAH). Reported in ppb.</b>							
Total PAH	bdl	NS	NS	NS	NS	NS	1000
<b>Total Recoverable Petroleum Hydrocarbons (TRPH). Reported in parts per million (ppm).</b>							
TRPH	31.4	119	44.2	<5.5	38	5.4	<sup>4</sup> 50
<b>Total Metals. Reported in milligrams per kilogram (mg/kg).</b>							
Cadmium	2.1	<0.57	<0.53	<0.55	NS	NS	37
Chromium	12.3	<2.8	<2.7	<2.8	NS	NS	50
Arsenic	2.0	0.78	0.94	6.2	NS	NS	10
Lead	681	7.1	12.2	73.2	NS	NS	108
<p><sup>1</sup> Chapter 62-775.400, Florida Administrative Code (FAC).  <sup>2</sup> This sample was collected from the source area prior to soil removal.  <sup>3</sup> The highest concentration detected in 07B00902 or its duplicate, 07B00902, is reported in this column.  <sup>4</sup> Provided total PAH does not exceed 1 ppm and total volatile organic halocarbons (VOH) do not exceed 50 ppb. In all other cases, the TRPH maximum concentration is 10 ppm (Chapter 62-775.400, FAC).</p> <p>Notes: UST = underground storage tank.  Total VOA = the sum concentration of benzene, toluene, ethylbenzene, and xylenes.  bdl = below detection limits.  NS = not sampled.  Total PAH = the sum concentration of PAH compounds detected by U.S. Environmental Protection Agency (USEPA) Method 8270A.  &lt; = less than.</p>							

**Table 1- 11**  
**Summary of Tentatively Identified Compounds,**  
**March 1995**

Contamination Assessment Report Addendum  
 Site 6, UST 119, Naval Aviation Depot  
 Pensacola, Florida

Contaminant	Groundwater Sample Designation									
	06G00101	06G00201	06G00301	06G00401	06G00501	06G00601	06G00701 <sup>1</sup>	06G00801	06G00901	
<b>Tentatively Identified Compounds (TICs). Estimated concentrations in part per billion (ppb).</b>										
Methylene Chloride <sup>2</sup>	40	30	30	25	ND	ND	29	21	21	
Propylene Glycol <sup>2</sup>	11	9	8	9	ND	8	17	13	13	
(E)-3-Chloro-2-methyl-2-pentenal <sup>2</sup>	110	ND	29	56	68	70	28	15	65	
1,4,-Dichlorobenzene-d4 <sup>2</sup>	85	ND	ND	56	46	50	ND	58	57	
Benzene, 1-methyl-4-(1-methylethyl)	ND	6	ND	ND	ND	ND	ND	ND	ND	
Benzene, (1,3,3,3-tetrachloropropyl)-	ND	ND	ND	ND	ND	ND	ND	9	ND	
N,N'-Bis(pentamethylene)thiuramtetrasulf	ND	ND	ND	ND	ND	11	ND	ND	ND	
Benzene, 1,2,3,4-d4,5,6-dichloro	ND	55	51	ND	ND	ND	57	ND	ND	
5-Imidazolic acid	ND	ND	6	ND	ND	ND	ND	ND	ND	
2-Nitro-.alpha.,.alpha.,.alpha.-trifluor	ND	ND	7	ND	ND	ND	ND	ND	ND	
Pyridine, 1,2,3,6-tetrahydro-1-nitroso	ND	ND	4	ND	ND	ND	ND	10	ND	
Stirofos	ND	ND	19	7	ND	ND	ND	ND	ND	
Oxazole, 2-phenyl	ND	ND	6	ND	ND	ND	10	ND	ND	
1-Ethyl-4-piperidone	ND	ND	ND	ND	ND	ND	18	ND	ND	
2-Cyclopenten-1-one, 2-hydroxy-3-methyl	ND	ND	ND	ND	ND	ND	15	ND	ND	
Oxyquinoline	ND	ND	ND	ND	ND	ND	ND	6	ND	
4-Chloro-2-fluoraniline	ND	ND	9	ND	ND	ND	6	ND	D	

See notes at end of table.

**Table 1-12**  
**Summary of Groundwater Analytical Results,**  
**February and April 1995**

Contamination Assessment Report  
 Site 7, UST 122, Naval Aviation Depot  
 Pensacola, Florida

Contaminant	Groundwater Sample Designation		State Maximum Contaminant Levels <sup>1</sup>
	07Z00101	07G00101	
<b>Volatile Organic Aromatics (VOA). Reported in parts per billion (ppb).</b>			
Benzene	<1.0	<1.0	1
Total VOA	<4.0	<4.0	50
<b>Total Recoverable Petroleum Hydrocarbons (TRPH). Reported in parts per million (ppm).</b>			
TRPH	<1.0	<1.0	
<b>Metals. Reported in ppb.</b>			
Arsenic	9.3	<5.0	50
Cadmium	<5.0	<5.0	10
Chromium	<50.0	<50.0	100
Lead	541	18.7	50
<b>Tentatively Identified Compounds (TICs)</b>			
Diphenyl Ether	19	ND	
Sulfur	58	ND	
3-Chloro-6-(methyl)Pyridazine	11	ND	
1,2,4-Trithiolane	ND	69	
1,2,4,5-Tetrathiane	ND	17	
1,2,4,6-Tetrathiepane	ND	10	
Caprolactum	ND	38	
N,N-bis (2-hydroxyethyl)-Dodecaneamine	ND	6	
Unknowns	ND	160	
<sup>1</sup> These maximum contaminant levels are applied according to Chapter 62-770.730(5)(a)3, Florida Administrative Code (FAC), Chapter 62-3.404(1)(a), FAC, and Chapter 62-550, Tables 1 through 3, FAC.  Notes: UST = underground storage tank. Total VOA = the sum concentration of benzene, toluene, ethylbenzene, and xylenes. < = less than. ND = not detected.			

The surficial zone is contiguous with land surface and contains groundwater under water table or perched water table conditions. The results of numerous borings conducted at NASP indicate that the surficial zone ranges in thickness between 40 and 70 feet and consists of tan and brown, fine to medium-grained quartz sand. Depth to the water table with the surficial zone is variable depending on location and ranges from less than 1 foot near surface water bodies to more than 20 feet in areas of higher elevation. Shallow groundwater in the surficial zone moves toward area of lower elevation and/or the nearest surface water body. Overall, the surficial zone has a high permeability (16 to 56 ft/day). Horizontal groundwater flow would generally be expected to be high.

The low permeability zone is underlying the surficial zone and is a zone of lower permeability sediments dominated by clay and silt-mixed material. At NASP this zone is generally composed of gray to blue, sandy, silty, slightly fossiliferous (shelly) clay and clayey sand ranging in thickness from 8 to 40 feet (G&M 1984, 1986). The result of laboratory permeability tests conducted on samples from this zone indicate that vertical hydraulic conductivities are low ( $4.2 \times 10^{-5}$  to  $9.9 \times 10^{-2}$  ft/day). Few, if any, wells are open to the low permeability zone at NASP; thus, no information is available regarding groundwater flow direction.

The main producing zone is the bottom portion of the Sand-and-Gravel Aquifer and consists mainly of sand and gravel interbedded with thin beds of silt and clay. The depth at which the main producing zone is encountered is somewhat variable, ranging from 60 to approximately 120 feet below land surface (BLS) at NASP. This zone generally has the highest permeability characteristics due to thicker and more persistent sand and gravel beds and is tapped by most of the major wells in the Pensacola area (Wilkins *et al.* 1985). The thickness of the main producing zone can be highly variable; however, it is estimated to be up to about 100 feet at NASP. Insufficient data exist for wells open to the main producing zone at NASP to determine direction of groundwater flow within this zone; however, the flow direction is assumed to be generally southward under ambient conditions. Pumpage of the supply wells would locally cause groundwater in this zone to flow toward the wells. Considerable potential exists for vertical groundwater flow from the surficial to the main producing zone at this location. It is not known to what extent this potential exists elsewhere at NASP.

The low limit of the Sand-and-Gravel Aquifer coincides with the top of a regionally extensive and vertically persistent hydrogeologic unit of much lower permeability. This unit is referred to as the Intermediate System. In the vicinity of NASP, the top of the Intermediate System generally lies within the sediments termed Miocene Coarse Clastics or corresponds to the top of the Upper Member of the Pensacola Clay and occurs at a depth of approximately 300 feet (Wilkins *et al.* 1985). In general, the Intermediate System consists of fine-grained sediments and functions as an effective confining unit which retards the exchange of water between the overlying Sand-and-Gravel Aquifer and the underlying Floridan Aquifer System (SEGS 1986). The entire sequence is primarily poor to non-water bearing. In the NASP area, the Intermediate System is approximately 1,100 feet thick and is composed of the lower portion of the Miocene Coarse Clastics, the Upper Member of the Pensacola Clay, the Escambia Sand Member of the Pensacola clay, and the Lower Member of the Pensacola Clay; all are of Miocene Age.

Immediately underlying the Intermediate System and occurring at a depth of approximately 1,500 feet BLS at NASP is the Floridan Aquifer System. The Floridan Aquifer in this area is composed of the Middle to Lower Miocene Chickasawhay Limestone and undifferentiated Tampa State Limestone. Groundwater within the Floridan Aquifer in this area is highly mineralized and is not used for water supply (Wagner et al. 1984).

In the immediate vicinity of Site 23, the surficial zone of the Sand-and-Gravel Aquifer probably occurs to a depth of about 50 feet BLS. Although no deep borings have been completed in the immediate vicinity of either site, data from numerous borings completed at various sites on NASP indicate a general surficial zone thickness of approximately 50 feet. Furthermore, the surficial zone thickens toward the western portion of the base. G&M (1984) provides drilling logs for borings conducted on NASP prior to the Verification Study. Included in this report is information concerning a group of boring (boring group 10) which was completed approximately 0.75 miles east of Site 23. The lithologic description of cuttings from boring group 10 indicates that the surficial zone consists primarily of tan and brown, fine to medium-grained quartz sand. A total of 10 shallow monitoring wells, open to the surficial zone, have been installed during previous investigation at Site 23. These wells indicate that the water table generally occurs between 1 and 4 feet BLS. The water level data collected from wells located on Site 23 indicate groundwater flow direction in the surficial zone is to the south-southeast and the horizontal hydraulic gradient is approximately 0.004. Based on groundwater data collected at Site 23, G&M (1986) estimated a horizontal shallow ground-water flow velocity of 0.36 ft/day or 130 ft/yr.

Based on data collected from borings completed at other NASP locations, it is assumed that the low permeability zone of the Sand-and-Gravel Aquifer occurs at approximately 50 feet and extends to a depth of approximately 100 BLS (G&M 1984). Based on reported lithologic data from boring group 10 (G&M 1984), this zone would be expected to function as a confining or semiconfining unit restricting the flow of groundwater between the surficial zone and the main producing zone which underlies the unit. The direction of groundwater flow with the low permeability zone is unknown.

## **1.7 WELL SURVEY**

Currently there are two potable water wells located at NASP that are permitted by the Northwest Florida Water Management District. Potable water to the base is mainly supplied by potable water wells located at Corry Station, located three miles to the north. The two potable water wells located at NASP are only used to supplement the potable water wells at Corry Station. NASP water supply wells No. 1 and No. 2 are located approximately 0.44 miles northwest and 0.74 miles west of Site 23, respectively. The supply wells were installed in 1942 to a depth open to the main producing zone. The wells yield, when in use, about 650 gpm, each. The depth to the static water level for supply well No. 1 and No. 2, in 1942, was approximately 32 feet and 38 feet, respectively. Well construction details are shown in Table 1-13.

## **2.0 SITE ASSESSMENT**

TABLE 1-13

CONSTRUCTION DETAILS OF WATER-SUPPLY WELLS

NAVAL AIR STATION, PENSACOLA, FLORIDA GROUNDWATER WELL NUMBER	#1 696	#2 706
Year Drilled	1942	1942
Depth Drilled	174' x 6"	178'
Length, outside casing	106"	114"
Diameter, outside casing	24" x 100' 12" x 106'	24" x 110' 12" x 114'
Material, outside casing	Steel	Steel
Depth to static water level	23'	24'
Normal suction lift (wkng. level)	32'	38'
Normal yield, GPM	650	650
Test yield, GPM	u/k	u/k
Type of grout	Cement	Cement
Drilling method	Rotary	Rotary
Type of strainer	Bronze	Bronze
Depth to top of strainer	106'	114'
Protection from surface water?	Yes	Yes
Is inundation of well possible?	No	No
Seal intrusion noted in past?	No	No
Has the well ever been contaminated?	No	No
Pump manufacturers' name	Layne Bowler	Layne Bowler
Model number	RKLC	RKLC
Capacity GPM	750	750
Check valve present in line?	Yes	Yes
Date of last servicing	Routine Maint.	Routine Maint.
Maintenance schedule (day/mo.)	Daily	Daily

Notes: uk=unknown  
s.s.=stainless

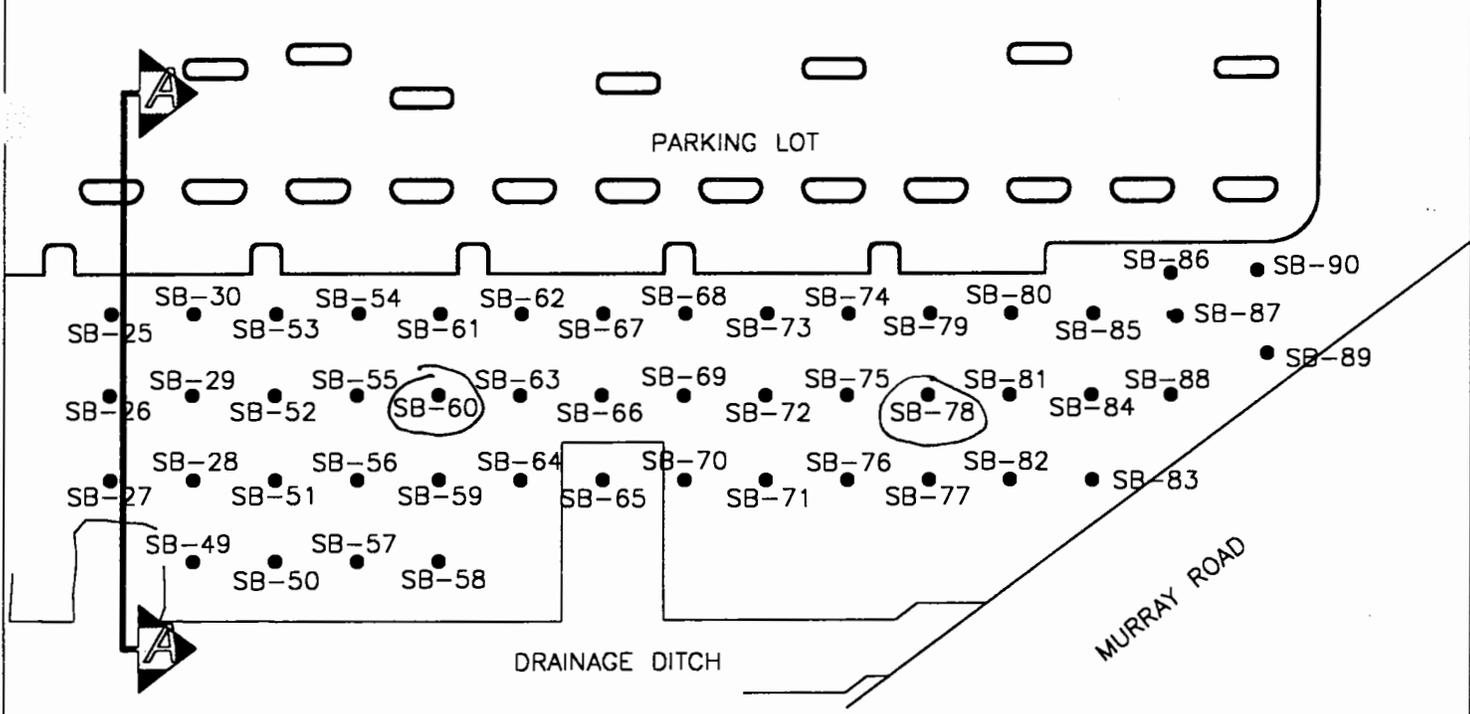
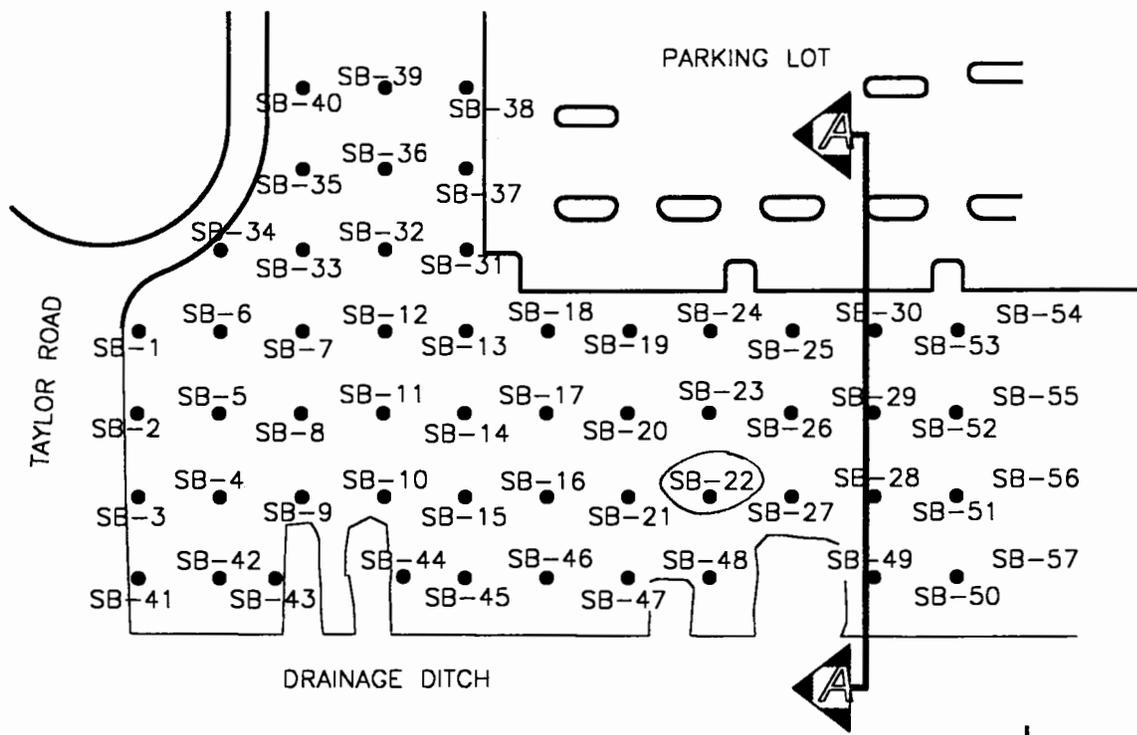
## **2.1 SOIL BORING AND MONITORING WELL CONSTRUCTION DETAILS**

Ninety soil borings (SB-1 thru SB-90), excluding monitoring well soil borings, were installed at the site on March 27 and April 8, 9, 1997 by W.E.S., Inc. to a depth of approximately 2 feet below land surface (BLS). Soil samples were collected at depths of 1 and 2 feet BLS. The soil borings were installed using a stainless steel hand auger. The stainless steel hand auger was decontaminated between borings using liquanox soap, isopropyl alcohol, and distilled water. Soil boring cuttings were placed back into the boreholes upon completion of installation. Soil borings SB-1 thru SB-30 were initially installed in a grid pattern at approximately 50 ft. apart. Soil samples were also collected from each of the boreholes during the installation of shallow monitoring wells MW-1 thru MW-6. Soil samples were collected at a depth of 1 foot BLS. Each soil sample collected was analyzed for volatile organic vapors using an organic vapor analyzer (OVA) with a flame ionization detector. Location maps of the soil borings and monitoring wells are provided in Figures 2-1 and 2-2, respectfully. Monitoring well construction diagrams for monitoring wells MW-1 thru MW-6 are shown in Appendix A. Lithological logs for monitoring wells MW-1 thru MW-6 are shown in Appendix B.

Shallow groundwater monitoring wells MW-1 thru MW-6 were installed at the site by W.E.S., Inc. personnel. Monitoring wells MW-1 thru MW-5 were installed on April 9, 1997. Shallow groundwater monitoring wells MW-1 thru MW-6 were installed to a depth of from 11.0' to 12.0' BLS depending on the groundwater depth. Monitoring wells MW-1 thru MW-6 were installed using a hollow stem auger with an inside diameter of 4 inches. The shallow groundwater monitoring wells consist of 2-inch diameter by 10 feet of 0.0010-inch slotted schedule 40 PVC screen, threaded to between 1.0 feet and 2.0 feet of solid schedule 40 PVC riser. The filter sand pack for monitoring wells consisted of coarse silica sand with a mesh size of 20 to 30. The sand filter pack was placed in the annular space between the outside of the well screen and borehole from the bottom of the borehole to approximately 0.25 to 0.50 foot above the well screen. A 0.5 foot to 1.0 foot bentonite seal was placed above the sand pack with the remaining annular space filled with cement grout. A flush mounted manhole was installed around the top of the monitoring wells with an 8" diameter manhole cover. A locking cap placed at the top of the monitoring wells completed the monitoring wells construction. The groundwater extracted during wells development was placed into steel 55 gallon drums and properly labeled for disposal. Plastic was placed under and on top of drill cuttings.

## **2.2 GROUNDWATER FLOW DIRECTION**

The top of casing elevations for monitoring wells MW-1 thru MW-6 were surveyed by W.E.S., Inc. on April 21, 1997. Survey benchmark is assumed elevation of 30.00 ft., NW Corner of Concrete Lamp Post, @ NW Corner of existing Asphalt parking lot. Groundwater elevations for the groundwater level measurements taken on September 11, 1997 are shown in Table 2-1. This site meets the "No Further Action" criteria in Rule 62-770.68(1), and therefore a groundwater flow direction map was not required.

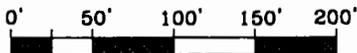


LEGEND

● SOIL BORING HOLE NUMBER



42



NAVY PUBLIC WORKS CENTER  
PENSACOLA, FLORIDA

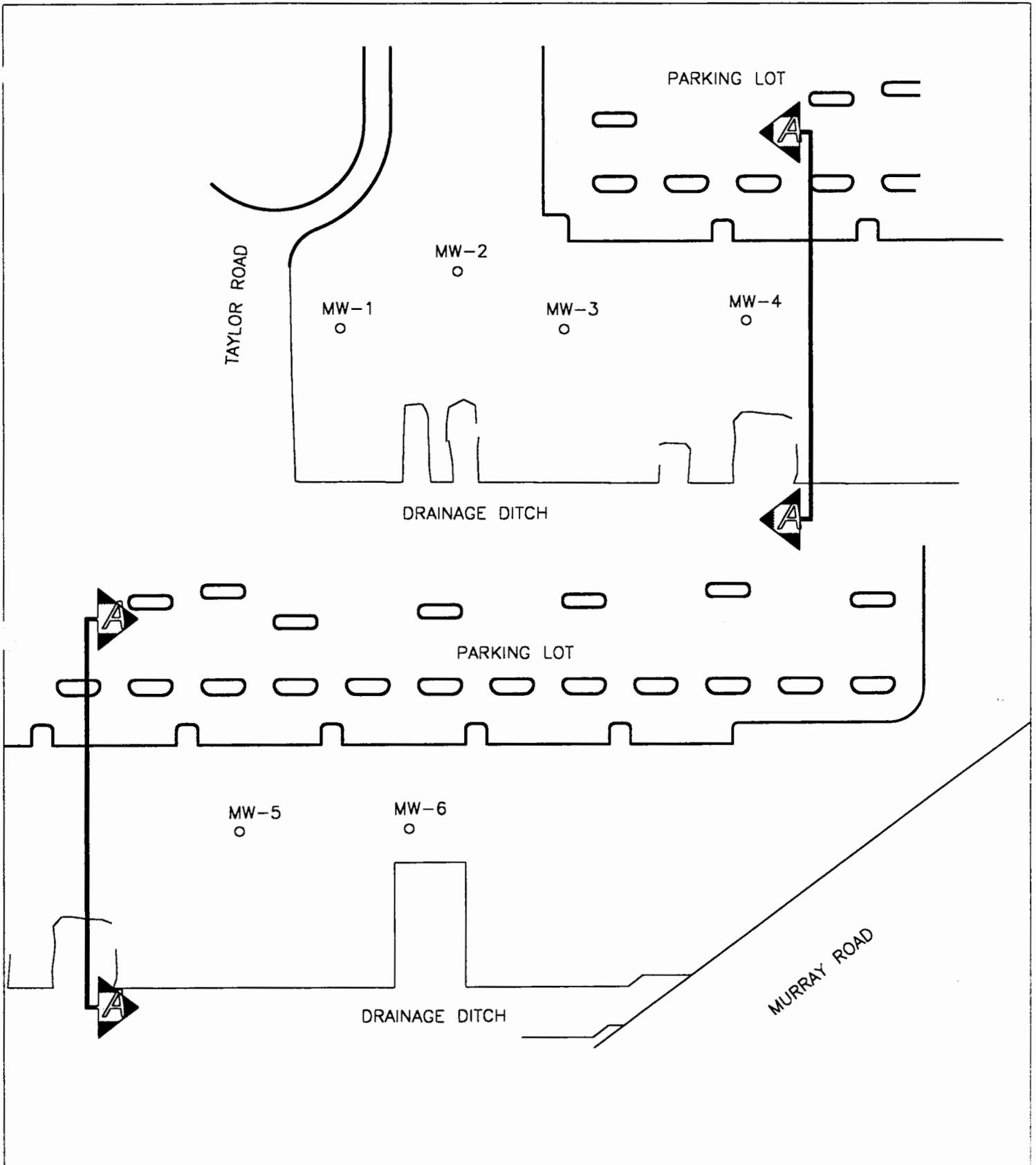
SCALE:  
DATE:

FIGURE  
2-1

DRAWN BY:  
DWG. NO:  
REVISED BY:

SOIL BORING LOCATION MAP  
SITE 23, NAVAL AIR STATION PENSACOLA

CLIENT: MAS ENVIRONMENTAL DEPARTMENT, MAS PENSACOLA

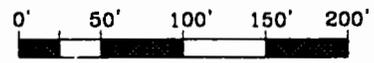


LEGEND

○ MONITORING WELL NUMBER



43



NAVY PUBLIC WORKS CENTER PENSACOLA, FLORIDA		
SCALE: DATE:	FIGURE 2-2	DRAWN BY: DWG. NO: REVISED BY:
MONITORING WELL LOCATION MAP SITE 23, NAVAL AIR STATION PENSACOLA		
CLIENT: NAS ENVIRONMENTAL DEPARTMENT, NAS PENSACOLA		

**TABLE 2-1  
TOP OF CASING AND GROUNDWATER ELEVATIONS  
NAVAL AIR STATION PENSACOLA, SITE 23**

WELL NUMBER	TOC FT. M.S.L.	DTW (FT)	GROUNDWATER ELEVATION
		9/11/97	9/11/97
MW-1	29.20	2.17	27.03
MW-2	28.89	1.76	27.13
MW-3	27.74	0.63	27.11
MW-4	27.41	0.32	27.09
MW-5	27.64	0.42	27.22
MW-6	27.30	0.14	27.16

NOTES: TOC = Top of Casing  
 DTW = Depth to Water  
 Benchmark assumes elevation of 30.00 ft., NW Corner of Concrete Lamp Post, @  
 NW Corner of existing Asphalt parking lot.

### **2.3 GROUNDWATER FLOW RATE**

The site meets the “No Further Action” criteria in Rule 62-770.68(1), and therefore the determination of groundwater flow rate was not required.

### **2.4 SOIL ASSESSMENT**

The extent of soil contamination at the site was determined by installation of soil borings and OVA screening of soil samples. The soil borings were installed using a stainless steel auger. Soil samples were collected from each borehole at depths of 1' and 2' BLS. The investigation was initiated by the installation of thirty soil borings (SB-1 thru SB-30) on March 27, 1997. The soil borings were installed from the north end of the site toward the south in a grid pattern with 50 ft. spacing. The VOC readings for all soil borings (SB-1 thru SB-90) were below detection limits (BDL).

In addition to the hand auger soil borings, soil samples were collected during the installation of monitoring wells MW-1 thru MW-6. Soil samples were collected from these boreholes at 1 foot BLS. The VOCs readings of the soil samples indicated all the soil samples collected from monitoring wells (MW-1 thru MW-6) were BDL. The location of the soil borings and monitoring wells is provided in Figures 2-1 and 2-2, respectively.

### **2.5 SITE SPECIFIC GEOLOGY AND HYDROGEOLOGY**

The principal aquifer of concern at the site is the surficial zone of the Sand-and-Gravel Aquifer. The surficial zone was penetrated to at depth of 12.5 feet during this investigation. The lithology at the site was found to be consistent and is generally composed of (1) red, brown medium sand/clay mix from 0 to 1 foot BLS and (2) increasingly more gray silty fine sand from 1 to 12 feet BLS. The groundwater table at the site was encountered at 1.5 feet BLS. Lithological logs describing the soils encountered at various depth, the approximate groundwater level, and OVA screening results for the soil borings installed during monitoring well installation are shown in Appendix B.

### **2.6 SURFACE WATER ASSESSMENT**

A man-made, concrete stormwater ditch, located directly adjacent to the site, is wet all season. The water entering the ditch eventually discharges to Bayou Grande. No groundwater or soil contamination was observed at the site, therefore no surface water assessment was performed at this site.

### **2.7 GROUNDWATER QUALITY ASSESSMENT**

Groundwater samples were extracted from shallow groundwater monitoring wells MW-1 thru MW-6 by W.E.S., Inc. personnel using the methods and procedures outlined in their Comprehensive Quality Assurance Plan No. 900465G. The groundwater samples were analyzed by NPWC laboratory using the method and procedures outlined in PWC's

Comprehensive Quality Assurance Plan No. 920121G. The groundwater samples were collected on April 14, 1997. The locations of the groundwater monitoring wells are shown in Figure 2-2. Groundwater samples were analyzed for volatile organic aromatics (VOAs), polynuclear aromatic hydrocarbons (PAHs), ethylene dibromide (EDB) and TPH using EPA methods 8260, 8270, 504 and FLPRO, respectively. Groundwater samples were collected from monitoring wells MW-1 thru MW-6 on September 11, 1997 by PWC personnel using quiescent sampling technique in accordance with the methods and procedures outlined in their Comprehensive Quality Assurance Plan (CompQAP). The groundwater samples were analyzed for total lead using EPA method SW6010A. A lead summary table is included as Table 2-2 and the analytical laboratory results are found in Appendix C.

The groundwater quality assessment was initiated by the installation of six shallow monitoring wells MW-1 thru MW-6 on April 9, 1997. The placement of the initial groundwater monitoring wells was dictated by the soil assessments performed at the site.

No VOAs, PAHs, EDB, or TPHs were detected in the groundwater samples collected from monitoring wells MW-1 thru MW-6. Groundwater sampling performed September 12, 1997 at Site 23 using the quiescent sampling technique detected lead at a concentration level of 4 ppb in monitoring well MW-6 which is well below the FDEPs regulatory limits of 15 ppb for lead. No lead was detected in monitoring well MW-1 thru MW-5.

### **3.0 CONCLUSIONS AND RECOMMENDATIONS**

#### **3.1 CONCLUSIONS**

- The source of the contamination has been eliminated.
- No initial remedial action was performed at the site.
- A total of 90 soil borings were installed to the groundwater table in order to delineate the extent of contaminated soils. Six additional soil samples were collected during the installation of monitoring wells MW-1 thru MW-6. No volatile organic compounds were detected in the soil samples collected from SB-1 thru SB-90 or MW-1 thru MW-6.
- Six shallow groundwater monitoring wells (MW-1 thru MW-6) were installed at the site. Groundwater samples were collected from each well and analyzed for the kerosene analytical group listed in FDEP Rule 62-770.600(8)(b).
- No kerosene analytical group contaminants were detected in monitoring wells MW-1 thru MW-5.
- No VOCs, PAHs, EDBs, or TPHs were detected in groundwater samples collected from monitoring wells MW-1 thru MW-6.

**TABLE 2-2**  
**SUMMARY OF LEAD**  
**ANALYTICAL RESULTS FOR GROUNDWATER SAMPLES**  
**COLLECTED FROM MONITORING WELLS MW-1 THRU MW-6**  
**NAVAL AIR STATION PENSACOLA, SITE 23**

PARAMETER	MONITORING WELL NUMBER					
	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6
Lead	BDL	BDL	BDL	BDL	BDL	4

NOTES: All results reported in parts per billion (ppb) unless otherwise noted  
BDL = Below detection limits  
Groundwater samples collected September 12, 1997

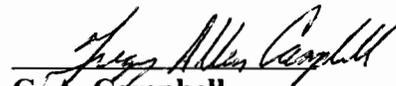
- Lead was detected in monitoring well MW-6 at a concentration level of 4 ppb which is well below the FDEPs regulatory limits of 15 ppb for lead. No lead was detected in MW-1 thru MW-5.
- NASP water supply wells No. 1 and No. 2 are located approximately 0.44 miles northwest and 0.74 miles west of Site 23, respectively.

### **3.2 RECOMMENDATIONS**

PWC Pensacola recommends, based upon the findings and conclusions contained in this report, that “no further action” be required for both the soil and groundwater at the site.

#### 4.0 PROFESSIONAL REVIEW CERTIFICATION

The Site Assessment contained in this report was prepared using sound, hydrogeologic principles and judgement. This assessment is based on the geologic investigation and associated information detailed in the text and appended to this report. If conditions are determined to exist that differ from those described, the undersigned engineer should be notified to evaluate the effects of any additional information on the assessment described in this report. This Site Assessment Report was developed for Naval Air Station Pensacola, Site 23, Pensacola, Florida, and should not be construed to apply to any other site.

  
G.A. Campbell  
Professional Engineer  
P.E. No. 38572

2/25/98  
Date

## 5.0 REFERENCES

Ecology and Environment, Inc. (E&E). 1991. Contamination Assessment/Remedial Activities, Naval Air Station Pensacola, Florida.

Geraghty and Miller, Inc. (G&M) 1984. Assessment of Potential Groundwater Pollution at Naval Air Station Pensacola, Florida.

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Southern Division Naval Facilities Engineering Command (SOUTHNAVFACENGCOM). 1995. Contamination Assessment Report Addendum Site 5, UST 116, Naval Aviation Depot, Naval Air Station, Pensacola, Florida.

Southern Division Naval Facilities Engineering Command (SOUTHNAVFACENGCOM). 1995. Contamination Assessment Report Addendum Site 6, UST 119, Naval Aviation Depot, Naval Air Station, Pensacola, Florida.

Southern Division Naval Facilities Engineering Command (SOUTHNAVFACENGCOM). 1995. Contamination Assessment Report Addendum Site 7, UST 122, Naval Aviation Depot, Naval Air Station, Pensacola, Florida.

## **APPENDICES**

**APPENDIX A**

**MONITORING WELL CONSTRUCTION DIAGRAM**

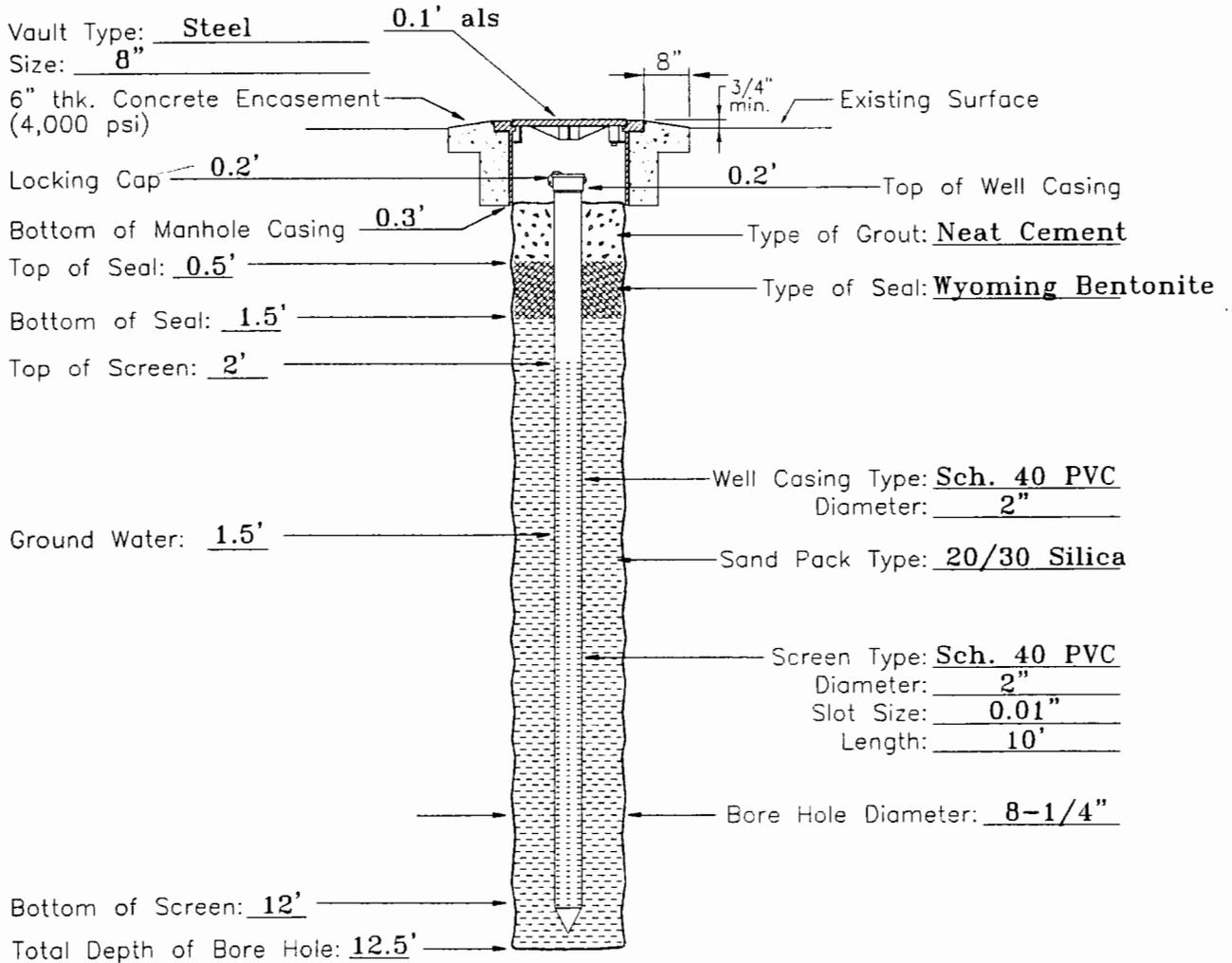
MONITOR WELL CONSTRUCTION DETAIL

6389 Tower Lane  
 Sarasota, FL 34240-8810  
 (941) 371-7617  
 (941) 378-5218 Fax

LOGGED BY: David M. Parker  
 DRILLING CONTRACTOR: S. FL Test & Dr.  
 DRILLER'S NAME: Craig Griffey  
 WELL NUMBER: MW-1

CLIENT: NPWC, ROICC, NAS Pensacola, FL  
 LOCATION: Site 23, Naval Air Station  
 JOB NUMBER: N65114-95-D-2126  
 DATE Start: 04/09/97 Finish: 04/09/97  
 TIME Start: 1300 Finish: 1320

COMMENTS: (Lost circulation interval, Water level changes, Hole collapse interval, etc.):



NOTE: DEPTHS SHOWN ARE BELOW LAND SURFACE (B.L.S.)

DRAWING ABOVE IS NOT TO SCALE

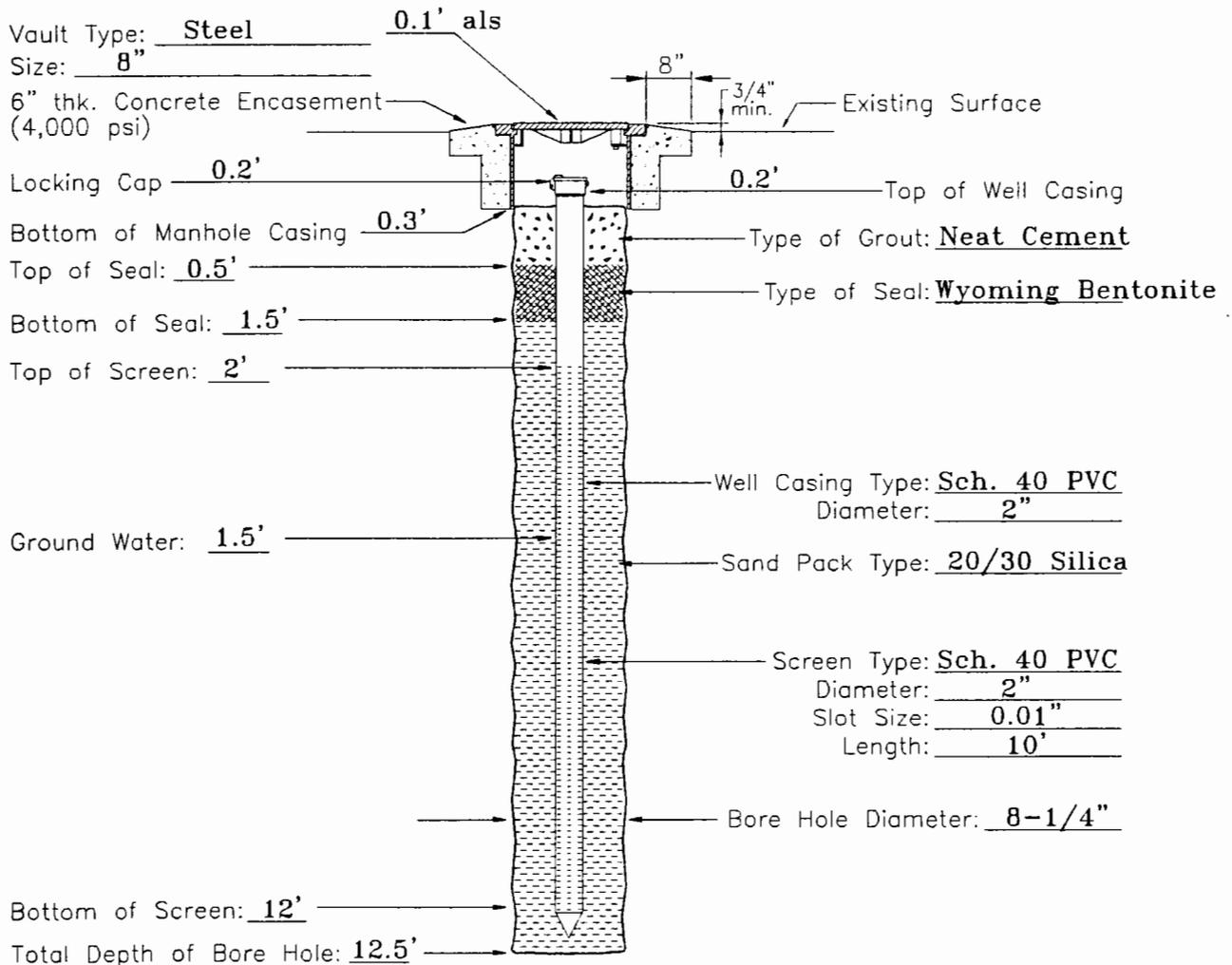
MONITOR WELL CONSTRUCTION DETAIL

6389 Tower Lane  
 Sarasota, FL 34240-8810  
 (941) 371-7617  
 (941) 378-5218 Fax

LOGGED BY: David M. Parker  
 DRILLING CONTRACTOR: S. FL Test & Dr.  
 DRILLER'S NAME: Craig Griffey  
 WELL NUMBER: MW-2

CLIENT: NPWC, ROICC, NAS Pensacola, FL  
 LOCATION: Site 23, Naval Air Station  
 JOB NUMBER: N65114-95-D-2126  
 DATE Start: 04/09/97 Finish: 04/09/97  
 TIME Start: 1320 Finish: 1345

COMMENTS: (Lost circulation interval, Water level changes, Hole collapse interval, etc.):



NOTE: DEPTHS SHOWN ARE BELOW LAND SURFACE (B.L.S.)

DRAWING ABOVE IS NOT TO SCALE

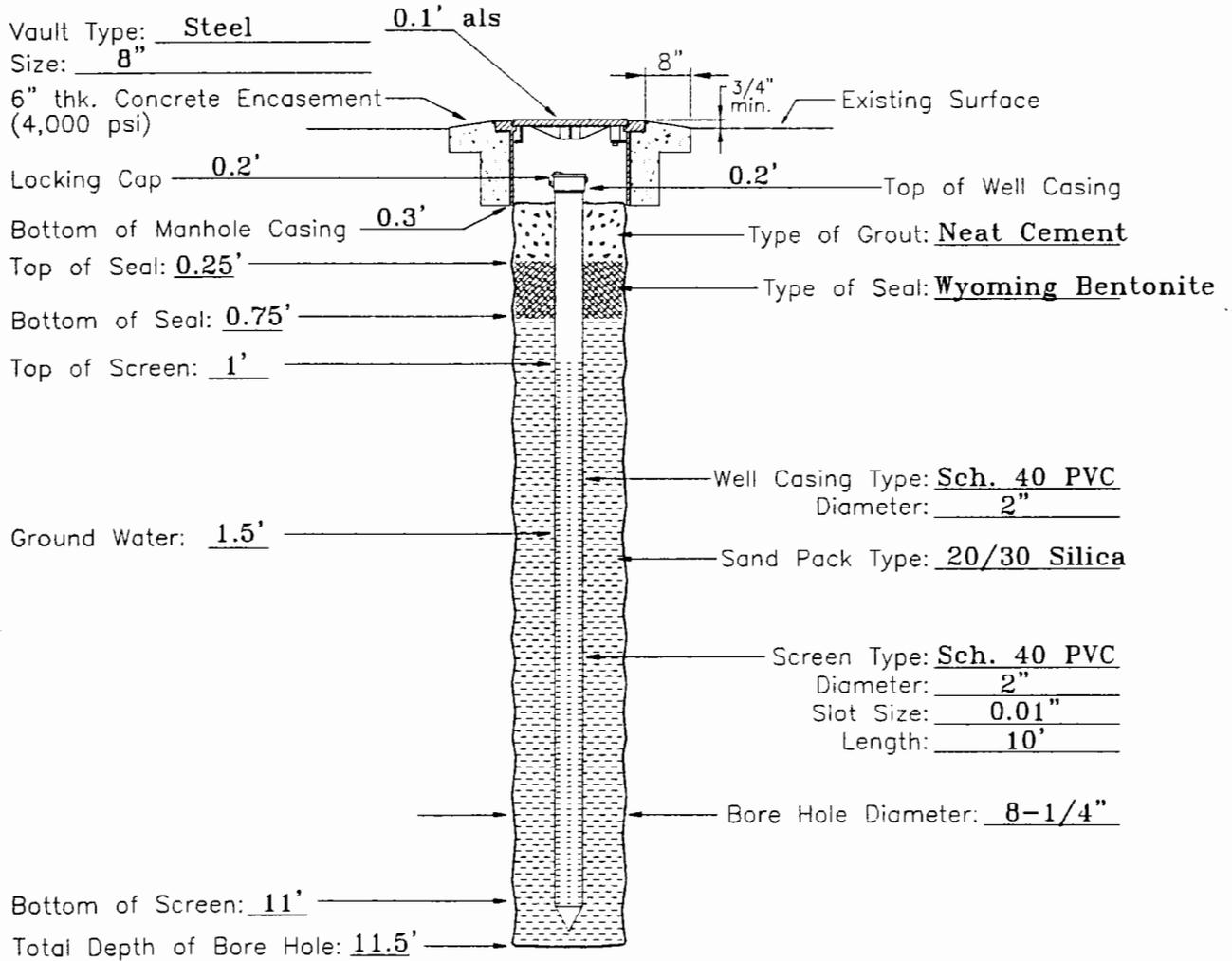
MONITOR WELL CONSTRUCTION DETAIL

6389 Tower Lane  
 Sarasota, FL 34240-8810  
 (941) 371-7617  
 (941) 378-5218 Fax

LOGGED BY: David M. Parker  
 DRILLING CONTRACTOR: S. FL Test & Dr.  
 DRILLER'S NAME: Craig Griffey  
 WELL NUMBER: MW-3

CLIENT: NPWC, ROICC, NAS Pensacola, FL  
 LOCATION: Site 23, Naval Air Station  
 JOB NUMBER: N65114-95-D-2126  
 DATE Start: 04/09/97 Finish: 04/09/97  
 TIME Start: 1345 Finish: 1415

COMMENTS: (Lost circulation interval, Water level changes, Hole collapse interval, etc.):



NOTE: DEPTHS SHOWN ARE BELOW LAND SURFACE (B.L.S.)

DRAWING ABOVE IS NOT TO SCALE

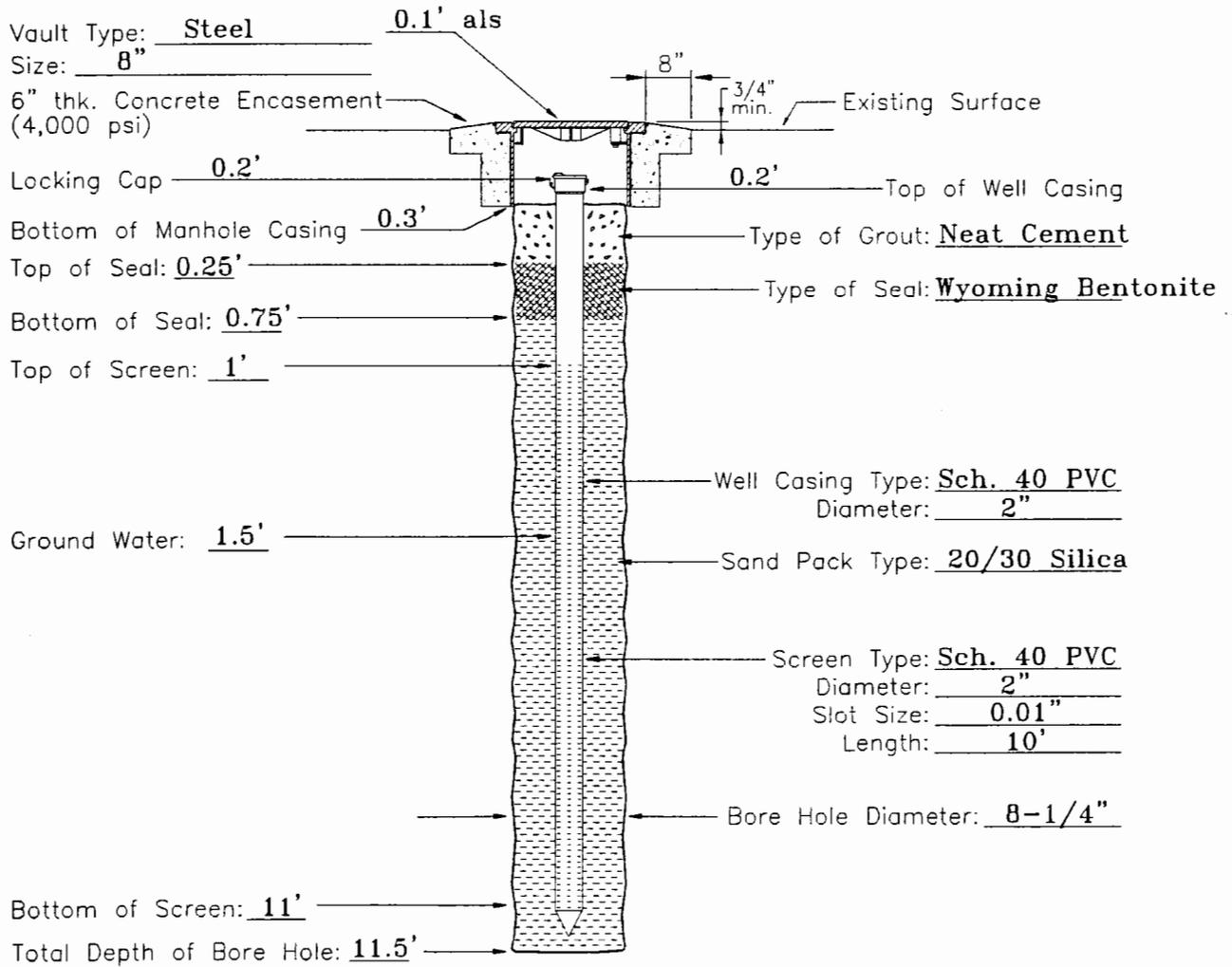
MONITOR WELL CONSTRUCTION DETAIL

6389 Tower Lane  
 Sarasota, FL 34240-8810  
 (941) 371-7617  
 (941) 378-5218 Fax

LOGGED BY: David M. Parker  
 DRILLING CONTRACTOR: S. FL Test & Dr.  
 DRILLER'S NAME: Craig Griffey  
 WELL NUMBER: MW-4

CLIENT: NPWC, ROICC, NAS Pensacola, FL  
 LOCATION: Site 23, Naval Air Station  
 JOB NUMBER: N65114-95-D-2126  
 DATE Start: 04/09/97 Finish: 04/09/97  
 TIME Start: 1415 Finish: 1440

COMMENTS: (Lost circulation interval, Water level changes, Hole collapse interval, etc.):



NOTE: DEPTHS SHOWN ARE BELOW LAND SURFACE (B.L.S.)

DRAWING ABOVE IS NOT TO SCALE

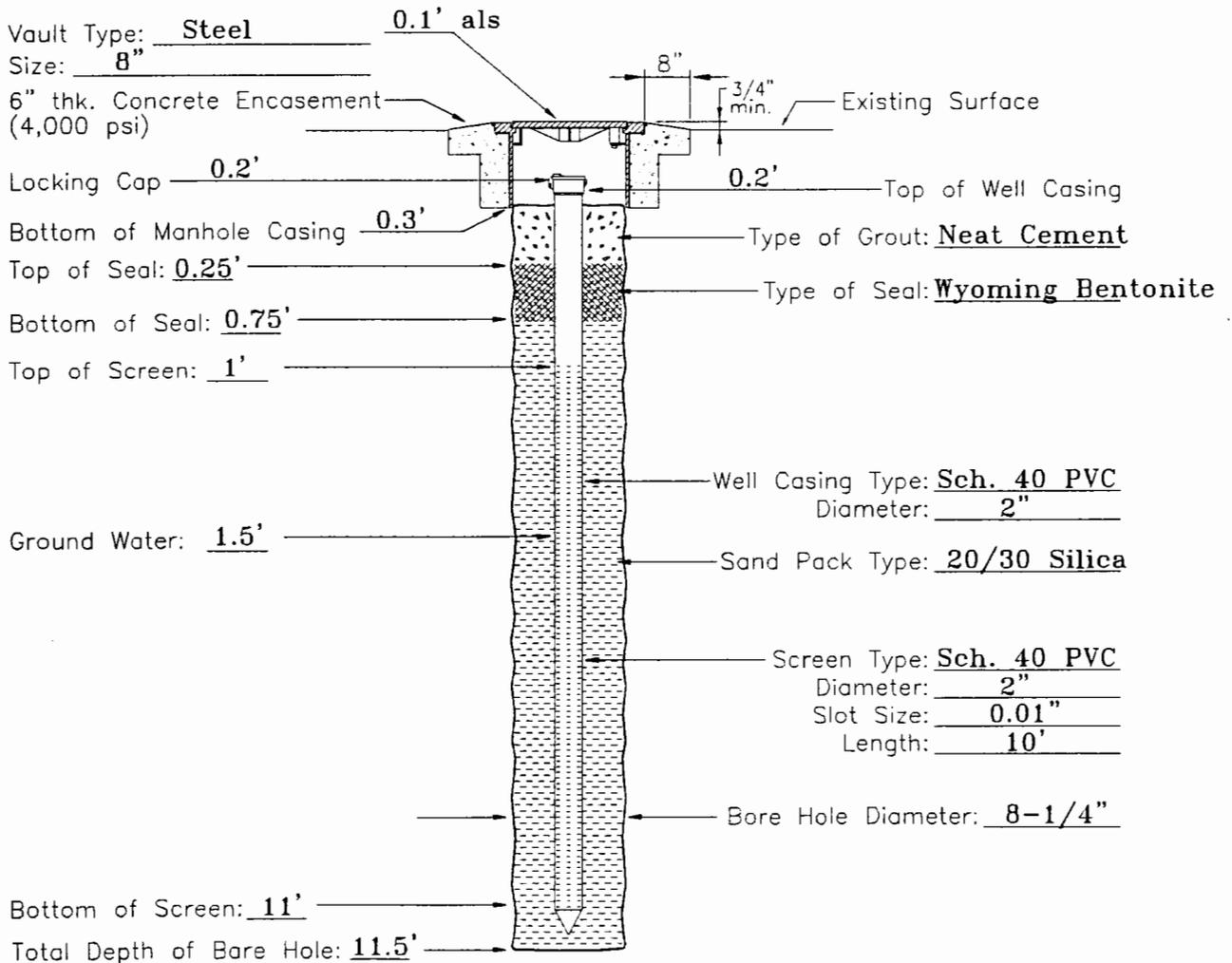
MONITOR WELL CONSTRUCTION DETAIL

6389 Tower Lane  
 Sarasota, FL 34240-8810  
 (941) 371-7617  
 (941) 378-5218 Fax

LOGGED BY: David M. Parker  
 DRILLING CONTRACTOR: S. FL Test & Dr.  
 DRILLER'S NAME: Craig Griffey  
 WELL NUMBER: MW-5

CLIENT: NPWC, ROICC, NAS Pensacola, FL  
 LOCATION: Site 23, Naval Air Station  
 JOB NUMBER: N65114-95-D-2126  
 DATE Start: 04/09/97 Finish: 04/09/97  
 TIME Start: 1440 Finish: 1510

COMMENTS: (Lost circulation interval, Water level changes, Hole collapse interval, etc.):



NOTE: DEPTHS SHOWN ARE BELOW LAND SURFACE (B.L.S.)

DRAWING ABOVE IS NOT TO SCALE

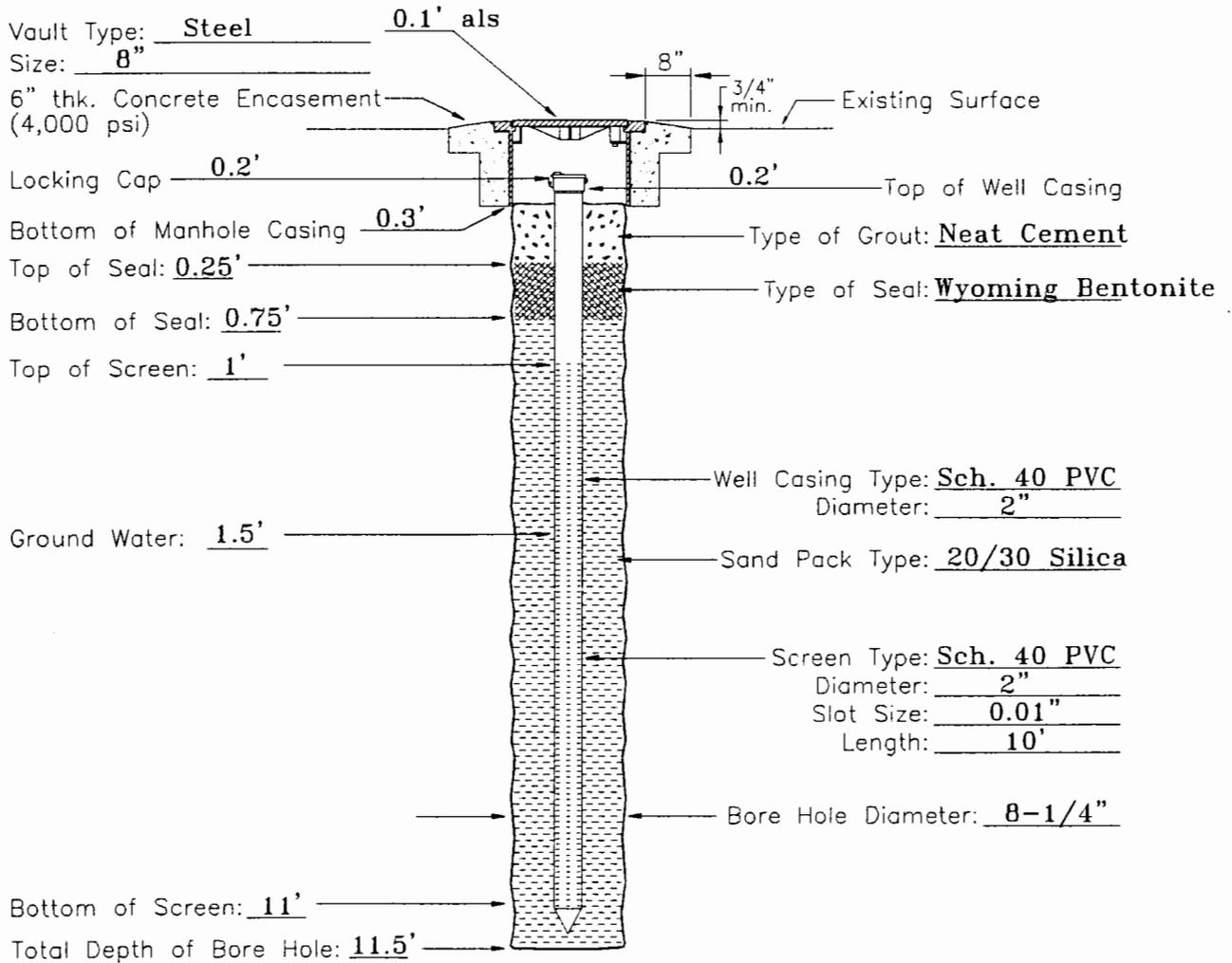
MONITOR WELL CONSTRUCTION DETAIL

6389 Tower Lane  
 Sarasota, FL 34240-8810  
 (941) 371-7617  
 (941) 378-5218 Fax

LOGGED BY: David M. Parker  
 DRILLING CONTRACTOR: S. FL Test & Dr.  
 DRILLER'S NAME: Craig Griffey  
 WELL NUMBER: MW-6

CLIENT: NPWC, ROICC, NAS Pensacola, FL  
 LOCATION: Site 23, Naval Air Station  
 JOB NUMBER: N65114-95-D-2126  
 DATE Start: 04/09/97 Finish: 04/09/97  
 TIME Start: 1510 Finish: 1530

COMMENTS: (Lost circulation interval, Water level changes, Hole collapse interval, etc.):



NOTE: DEPTHS SHOWN ARE BELOW LAND SURFACE (B.L.S.)

DRAWING ABOVE IS NOT TO SCALE

**APPENDIX B**

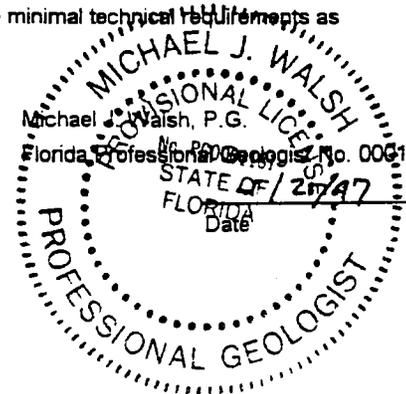
**LITHOLOGIC LOGS**

Site 23					LOGGED BY: David Parker	SHEET 1 OF 1				
Naval Air Station					Contractor: WES, Inc.	Dr. Method: POST HOLE				
Pensacola, Florida					Driller: South Florida Testing & Drilling	Dr. Rig: NA				
MONITORING WELL NO.: MW-1					Start Date: 04/09/97	Completed: 04/09/97				
Delivery Order 0050					Start Time: 1300	Finish Time: 1320				
Contract No. N65114-95-D-2126					CONTAMINATION DATA					
T Y P E	N U M B E R	B O R E W	SAMP. INTV. (FT.)	SAMP. RECV. (IN)	DEPTH	DESCRIPTION OF MATERIALS AND CONDITIONS	OVA RESULTS (PPM) CARBON FILTER		NOTES	
P O S T  H O L E  H S A  H A					1	0'-1'; Red. Brown Medium Sand/Clay Mix.	W/O NR	WITH NR	NET 0	
			Water Table @ 1.5' BLS			2				
					3	1'-12'; Becomes Increasingly More Gray Silty Fine Sand.				
					4					
					5					
					6					
					7					
					8					
					9					
					10					
					11					
					12	End of Boring @ 12' BLS				
				13						
				14						
				15						

I Certify that this lithological log, including geological and hydrogeological interpretations, has been prepared under my direct supervision and meets the minimal technical requirements as set forth in Chapter 492 of the Florida Statutes.

Reviewed by:

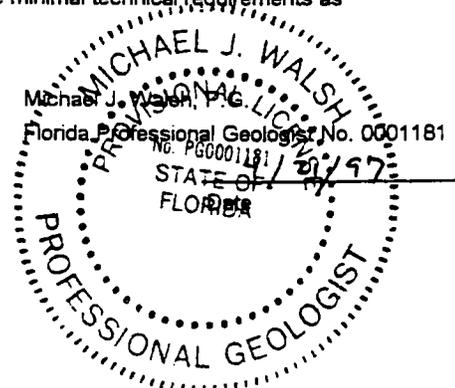
Michael J. Walsh, P.G.  
 Florida Professional Geologist No. 0061181  
 STATE OF FLORIDA  
 Date 4/27/97



Site 23					LOGGED BY: David Parker		SHEET 1 OF 1			
Naval Air Station					Contractor: WES, Inc.		Dr. Method: POST HOLE			
Pensacola, Florida					Driller: South Florida Testing & Drilling		Dr. Rig: NA			
MONITORING WELL NO.: MW-2					Start Date: 04/09/97		Completed: 04/09/97			
Delivery Order 0050					Start Time: 1320		Finish Time: 1345			
					Contract No. N65114-95-D-2126		CONTAMINATION DATA			
T Y P E	N U M B E R	B O R E H O L E	SAMP. INTV. (FT.)	SAMP. RECV. (IN)	DEPTH	DESCRIPTION OF MATERIALS AND CONDITIONS	OVA RESULTS NOTES			
							(PPM) CARBON FILTER			
P O S T  H O L E  H S A  H A					1	0'-1'; Brown, Silty Fine Sand.	W/O NR	WITH NR	NET 0	
			Water Table @ 1.5' BLS			2				
						3	1'-12'; Becomes increasingly More Gray Silty Fine Sand.			
						4				
						5				
						6				
						7				
						8				
						9				
						10				
						11				
						12	End of Boring @ 12' BLS			
						13				
						14				
						15				

I Certify that this lithological log, including geological and hydrogeological interpretations, has been prepared under my direct supervision and meets the minimal technical requirements as set forth in Chapter 492 of the Florida Statutes.

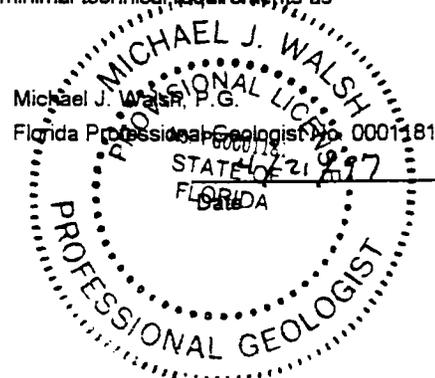
Reviewed by:



Site 23					LOGGED BY: David Parker	SHEET 1 OF 1			
Naval Air Station					Contractor: WES, Inc.	Dr. Method: POST HOLE			
Pensacola, Florida					Driller: South Florida Testing & Drilling	Dr. Rig: NA			
MONITORING WELL NO.: MW-3					Start Date: 04/09/97	Completed: 04/09/97			
Delivery Order 0050					Start Time: 1345	Finish Time: 1415			
Contract No. N65114-95-D-2126					CONTAMINATION DATA				
TYPE	N	B	SAMP. INTV. (FT.)	SAMP. RECV. (IN)	DEPTH	DESCRIPTION OF MATERIALS AND CONDITIONS	OVA RESULTS (PPM) CARBON FILTER		
							W/O	WITH	NET
P O S T  H O L E  H S A  H A					1	0'-1'; Red Brown, Clayey.	80	NR	80
			Water Table @ 1.5' BLS			2			
					3	1'-11'; Becomes Increasingly More Gray Silty Fine Sand.			
					4				
					5				
					6				
					7				
					8				
					9				
					10				
					11	End of Boring @ 11' BLS			
					12				
					13				
					14				
					15				

I Certify that this lithological log, including geological and hydrogeological interpretations, has been prepared under my direct supervision and meets the minimal technical requirements as set forth in Chapter 492 of the Florida Statutes.

Reviewed by:

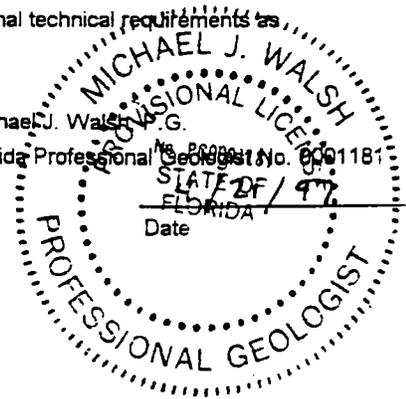


Site 23					LOGGED BY: David Parker	SHEET 1 OF 1			
Naval Air Station					Contractor: WES, Inc.	Dr. Method: POST HOLE			
Pensacola, Florida					Driller: South Florida Testing & Drilling	Dr. Rig: NA			
MONITORING WELL NO.: MW-4					Start Date: 04/09/97	Completed: 04/09/97			
					Start Time: 1415	Finish Time: 1440			
Delivery Order 0050					Contract No. N65114-95-D-2126	CONTAMINATION DATA			
T Y P E	N U M B E R	B O W	SAMP. INTV. (FT.)	SAMP. RECV. (IN)	DEPTH	DESCRIPTION OF MATERIALS AND CONDITIONS	OVA RESULTS (PPM) CARBON FILTER		
							W/O	WITH	NET
P O S T  H O L E  H S A  H A			Water Table @ 1.5' BLS		1	0'-1'; Dark Brown, Silty, Fine Sand.	>1000	>1000	>1000
					2				
					3	1'-11'; Becomes Increasingly More Gray Silty Fine Sand.			
					4				
					5				
					6				
					7				
					8				
					9				
					10				
					11	End of Boring @ 11' BLS			
					12				
					13				
					14				
					15				

I Certify that this lithological log, including geological and hydrogeological interpretations, has been prepared under my direct supervision and meets the minimal technical requirements as set forth in Chapter 492 of the Florida Statutes.

Reviewed by:

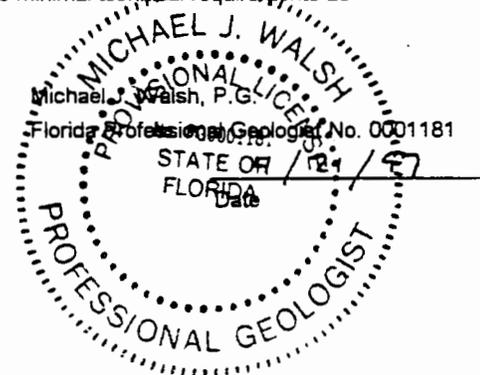
Michael J. Walsh, P.G.  
 Florida Professional Geologist No. 6001181  
 STATE OF FLORIDA  
 Date: 04/09/97



Site 23					LOGGED BY: David Parker	SHEET 1 OF 1			
Naval Air Station					Contractor: WES, Inc.	Dr. Method: POST HOLE			
Pensacola, Florida					Driller: South Florida Testing & Drilling	Dr. Rig: NA			
MONITORING WELL NO.: MW-5					Start Date: 04/09/97	Completed: 04/09/97			
Delivery Order 0050					Start Time: 1440	Finish Time: 1510			
Contract No. N65114-95-D-2126					CONTAMINATION DATA				
T Y P E	N U M B E R	B L O C K	SAMP. INTV. (FT.)	SAMP. RECV. (IN)	DEPTH	DESCRIPTION OF MATERIALS AND CONDITIONS	OVA RESULTS (PPM) CARBON FILTER		
							W/O	WITH	NET
P O S T  H O L E  H S A  H A					1	0'-1'; Dark Brown, Silty, Fine Sand.	>1000	>1000	>1000
			Water Table @ 1.5' BLS			2			
					3	1'-11'; Becomes Increasingly More Gray Silty Fine Sand.			
					4				
					5				
					6				
					7				
					8				
					9				
					10				
					11	End of Boring @ 11' BLS			
					12				
					13				
					14				
					15				

I Certify that this lithological log, including geological and hydrogeological interpretations, has been prepared under my direct supervision and meets the minimal technical requirements as set forth in Chapter 492 of the Florida Statutes.

Reviewed by:

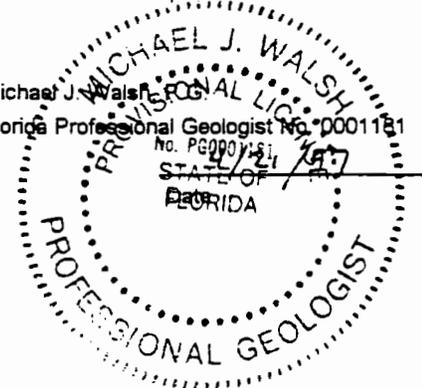


Site 23					LOGGED BY: David Parker	SHEET 1 OF 1			
Naval Air Station					Contractor: WES, Inc.	Dr. Method: POST HOLE			
Pensacola, Florida					Driller: South Florida Testing & Drilling	Dr. Rig: NA			
MONITORING WELL NO.: MW-6					Start Date: 04/09/97	Completed: 04/09/97			
					Start Time: 1510	Finish Time: 153			
Delivery Order 0050					Contract No. N65114-95-D-2126	CONTAMINATION DATA			
T Y P E	N U M B	B L O W	SAMP. INTV. (FT.)	SAMP. RECV. (IN)	DEPTH	DESCRIPTION OF MATERIALS AND CONDITIONS	OVA RESULTS		
							(PPM) CARBON FILTER	NOTES	
P O S T  H O L E  H S A  H A					1	0'-1'; Dark Brown, Silty, Fine Sand.	W/O >1000	WITH >1000	NET >1000
			Water Table @ 1.5' BLS			2			
					3	1'-11'; Becomes Increasingly More Gray Silty Fine Sand.			
					4				
					5				
					6				
					7				
					8				
					9				
					10				
					11	End of Boring @ 11' BLS			
					12				
					13				
					14				
					15				

I Certify that this lithological log, including geological and hydrogeological interpretations, has been prepared under my direct supervision and meets the minimal technical requirements as set forth in Chapter 492 of the Florida Statutes.

Reviewed by:

Michael J. Walsh, P.G.  
Florida Professional Geologist No. 0001181



**APPENDIX C**

**SOIL AND GROUNDWATER ANALYTICAL RESULTS**

# Navy Public Works Center Environmental Laboratory

Bldg. 3887, Code 920  
NAS Pensacola, FL 32508 - 6500  
Phone (904) 452-4728/3642  
DSN 922-4728/3642

Client: NPWC Environmental  
Address: Bldg. 3887, Code 910  
NAS Pensacola, FL 32508  
Phone #: 452-3180  
Contact: Greg Campbell

## Analytical Report

601/602 Volatiles by Method 8260

Lab Report Number: 71500  
Sample Date: 04/14/97  
Received Date: 04/14/97  
Sample Site: NAS Pensacola, FL  
Job Order No.: 130 5001

LAB Sample ID#	1- <b>71500</b>			
Sample Name / Location	Site 23 MW-5			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0900			
Sample Type (composite or grab)	Grab			
Analyst	J. Moore			
Date of Extraction / Initials	04/16/97 JM			
Date of Analysis	04/16/97			
Sample Matrix	N/S			
Dilution	X 1			
<b>Compound Name</b>	<b>1- 71500</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Benzene	BDL	ug/L	1	
Bromodichloromethane	BDL	ug/L	1	
Bromoform	BDL	ug/L	2	
Bromomethane	BDL	ug/L	3	
Carbon Tetrachloride	BDL	ug/L	1	
Chlorobenzene	BDL	ug/L	1	
Chloroethane	BDL	ug/L	1	
2-Chloroethylvinyl ether	BDL	ug/L	1	
Chloroform	BDL	ug/L	1	
Chloromethane	BDL	ug/L	1	
Dibromochloromethane	BDL	ug/L	1	
1,2-Dichlorobenzene	BDL	ug/L	1	
1,3-Dichlorobenzene	BDL	ug/L	1	
1,4-Dichlorobenzene	BDL	ug/L	1	
Dichlorodifluoromethane	BDL	ug/L	1	
1,1-Dichloroethane	BDL	ug/L	1	
1,2-Dichloroethane	BDL	ug/L	1	
1,1-Dichloroethene	BDL	ug/L	1	
trans-1,2-Dichloroethene	BDL	ug/L	1	
1,2-Dichloropropane	BDL	ug/L	1	
cis-1,3-Dichloropropene	BDL	ug/L	1	
trans-1,3-Dichloropropene	BDL	ug/L	1	
Ethylbenzene	BDL	ug/L	1	
Methylene Chloride	BDL	ug/L	1	
Methyl-tert-butyl ether (MTBE) *	BDL	ug/l	1	
1,1,2-Tetrachloroethane	BDL	ug/L	1	
Tetrachloroethene	BDL	ug/L	1	
Toluene	BDL	ug/L	1	
1,1,1-Trichloroethane	BDL	ug/L	1	
1,1,2-Trichloroethane	BDL	ug/L	1	
Trichloroethene	BDL	ug/L	1	
Trichlorofluoromethane	BDL	ug/L	1	
Vinyl Chloride	BDL	ug/L	1	
Xylenes (Total)	BDL	ug/L	1	

### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
1,2-Dichloroethane-d4	75-133	107
Toluene-d8	86-119	101
Bromofluorobenzene	85-116	102

COMMENTS :

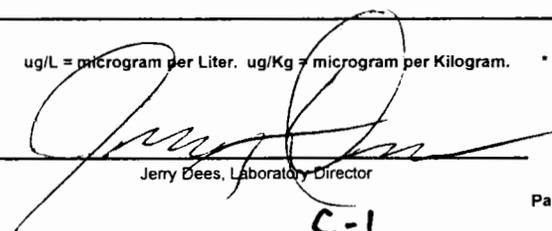
\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

BDL = Below Detection Limit. ug/L = microgram per Liter. ug/Kg = microgram per Kilogram. \* = FL HRS certification pending.

Approved by :

  
Jerry Dees, Laboratory Director

Date: 5/5/97

Report Generated

C-1

# Navy Public Works Center Environmental Laboratory

Bldg. 3887, Code 920  
NAS Pensacola, FL 32508 - 6500  
Phone (904) 452-4728/3642  
DSN 922-4728/3642

Client: NPWC Environmental  
Address: Bldg. 3887, Code 910  
NAS Pensacola, FL 32508  
Phone #: 452-3180  
Contact: Greg Campbell

## Analytical Report

610 PAH's by Method 8270

Lab Report Number: 71500  
Sample Date: 04/14/97  
Received Date: 04/14/97  
Sample Site: NAS Pensacola, FL  
Job Order No.: 130 5001

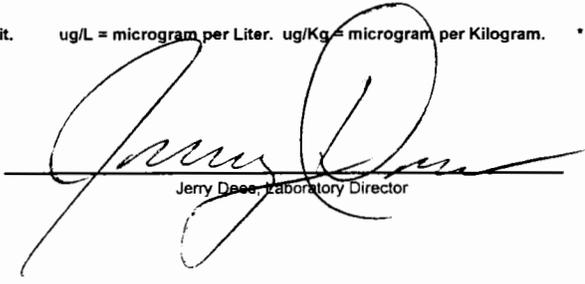
LAB Sample ID#	1- <b>71500</b>			
Sample Name / Location	Site 23 MW-5			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0900			
Sample Type (composite or grab)	Grab			
Analyst	M. Chambers			
Date of Extraction / Initials	04/15/97 JJ			
Date of Analysis	04/16/97			
Sample Matrix	N/S			
Dilution	X 1			
<b>Compound Name</b>	<b>1- 71500</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Acenaphthene	BDL	ug/L	2	
Acenaphthylene	BDL	ug/L	2	
Anthracene	BDL	ug/L	2	
Benzo(a)anthracene	BDL	ug/L	2	
Benzo(a)pyrene	BDL	ug/L	2	
Benzo(b)fluoranthene	BDL	ug/L	2	
Benzo(g,h,i)perylene	BDL	ug/L	2	
Benzo(k)fluoranthene	BDL	ug/L	3	
Chrysene	BDL	ug/L	2	
Dibenz(a,h)anthracene	BDL	ug/L	2	
Fluoranthene	BDL	ug/L	2	
Fluorene	BDL	ug/L	2	
Indeno(1,2,3-cd)pyrene	BDL	ug/L	2	
1-Methylnaphthalene *	BDL	ug/L	2	
2-Methylnaphthalene	BDL	ug/L	3	
Naphthalene	BDL	ug/L	2	
Phenanthrene	BDL	ug/L	2	
Pyrene	BDL	ug/L	2	

### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
Nitrobenzene- d5	35-114	64
2-Fluorobiphenyl	43-116	71
Terphenyl -d14	33-141	115

COMMENTS : \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

BDL = Below Detection Limit. ug/L = microgram per Liter. ug/Kg = microgram per Kilogram. \* = FL HRS certification pending.

Approved by :   
 Jerry Dees, Laboratory Director

Date: 5/5/97  
 Report Generated

# Navy Public Works Center

## Environmental Laboratory

Bldg. 3887, Code 920  
 NAS Pensacola, FL 32508 - 6500  
 Phone (904) 452-4728/3642  
 DSN 922-4728/3642

Client: NPWC Environmental  
 Address: Bldg. 3887, Code 910  
 NAS Pensacola, FL 32508  
 Phone #: 452-3180  
 Contact: Greg Campbell

## Analytical Report

### Ethylene Dibromide by Method 504

Lab Report Number: 71500  
 Sample Date: 04/14/97  
 Received Date: 04/14/97  
 Sample Site: NAS Pensacola, FL  
 Job Order No.: 130 5001

LAB Sample ID#	1- <b>71500</b>			
Sample Name / Location	Site 23 MW-5			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0900			
Sample Type (composite or grab)	Grab			
Analyst	J. Moore			
Date of Extraction / Initials	04/16/97 JM			
Date of Analysis	04/16/97			
Sample Matrix	N/S			
Dilution	X		1	
<b>Compound Name</b>	<b>1- 71500</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Ethylene Dibromide	BDL	ug/L	0.02	

### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
Tetra-Chloro-m-Xylene	54-140	84

COMMENTS :

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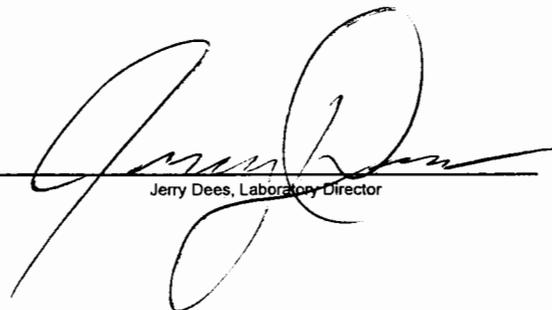
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BDL = Below Detection Limit. ug/L = microgram per Liter. ug/Kg = microgram per Kilogram.

Approved by :



Jerry Dees, Laboratory Director

Date: 5/5/97

Report Generated

# Navy Public Works Center

## Environmental Laboratory

Bldg. 3887, Code 920  
 NAS Pensacola, FL 32508 - 6500  
 Phone (904) 452-4728/3642  
 DSN 922-4728/3642

Client: NPWC Environmental  
 Address: Bldg. 3887, Code 910  
 NAS Pensacola, FL 32508  
 Phone #: 452-3180  
 Contact: Greg Campbell

# Analytical Report

## Petroleum Range Organics by FLPRO

Lab Report Number: 71500  
 Sample Date: 04/14/97  
 Received Date: 04/14/97  
 Sample Site: NAS Pensacola, FL  
 Job Order No.: 130 5001

LAB Sample ID#	1- <b>71500</b>			
Sample Name / Location	Site 23 MW-5			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0900			
Sample Type (composite or grab)	Grab			
Analyst	J. Moore			
Date of extraction / Initials	04/28/97 JM			
Date of Analysis	04/28/97			
Sample Matrix	N/S			
Dilution	x 1			
<b>Parameter</b>	<b>1- 71500</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Petroleum Range Organics by FLPRO	BDL	mg/L	0.25	

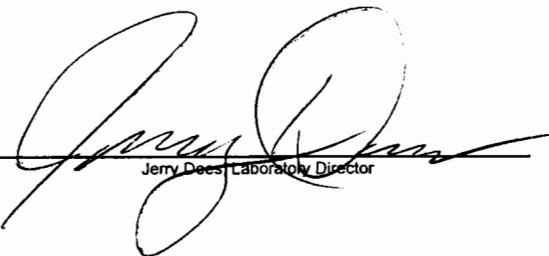
### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
ortho-Terphenyl	82-142 *	79
Nonatriacontane (C-39)	42-193 *	62

COMMENTS : \* = Suggested surrogate recovery limits listed in the method. In-house laboratory limits are in the process of being determined.

BDL = Below Detection Limit. mg/L = milligram per Liter. mg/Kg = milligram per Kilogram.

Approved by :



Jerry Dees, Laboratory Director

Date: 5/5/97

# Navy Public Works Center Environmental Laboratory

Bldg. 3887, Code 920  
NAS Pensacola, FL 32508 - 6500  
Phone (904) 452-4728/3642  
DSN 922-4728/3642

Client: NPWC Environmental  
Address: Bldg. 3887, Code 910  
NAS Pensacola, FL 32508  
Phone #: 452-3180  
Contact: Greg Campbell

## Analytical Report

601/602 Volatiles by Method 8260

Lab Report Number: 71501  
Sample Date: 04/14/97  
Received Date: 04/14/97  
Sample Site: NAS Pensacola, FL  
Job Order No.: 130 5001

LAB Sample ID#	1- <b>71501</b>				
Sample Name / Location	Site 23 MW-6				
Collector's Name	MWH				
Date & Time Collected	04/14/97 @ 0915				
Sample Type (composite or grab)	Grab				
Analyst	J. Moore				
Date of Extraction / Initials	04/16/97 JM				
Date of Analysis	04/16/97				
Sample Matrix	N/S				
Dilution	X 1				
<b>Compound Name</b>	<b>1-</b>	<b>71501</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Benzene	BDL		ug/L	1	
Bromodichloromethane	BDL		ug/L	1	
Bromoform	BDL		ug/L	2	
Bromomethane	BDL		ug/L	3	
Carbon Tetrachloride	BDL		ug/L	1	
Chlorobenzene	BDL		ug/L	1	
Chloroethane	BDL		ug/L	1	
2-Chloroethylvinyl ether	BDL		ug/L	1	
Chloroform	BDL		ug/L	1	
Chloromethane	BDL		ug/L	1	
Dibromochloromethane	BDL		ug/L	1	
1,2-Dichlorobenzene	BDL		ug/L	1	
1,3-Dichlorobenzene	BDL		ug/L	1	
1,4-Dichlorobenzene	BDL		ug/L	1	
Dichlorodifluoromethane	BDL		ug/L	1	
1,1-Dichloroethane	BDL		ug/L	1	
1,2-Dichloroethane	BDL		ug/L	1	
1,1-Dichloroethene	BDL		ug/L	1	
trans-1,2-Dichloroethene	BDL		ug/L	1	
1,2-Dichloropropane	BDL		ug/L	1	
cis-1,3-Dichloropropene	BDL		ug/L	1	
trans-1,3-Dichloropropene	BDL		ug/L	1	
Ethylbenzene	BDL		ug/L	1	
Methylene Chloride	BDL		ug/L	1	
Methyl-tert-butyl ether (MTBE) *	BDL		ug/L	1	
1,1,2,2-Tetrachloroethane	BDL		ug/L	1	
Tetrachloroethene	BDL		ug/L	1	
Toluene	BDL		ug/L	1	
1,1,1-Trichloroethane	BDL		ug/L	1	
1,1,2-Trichloroethane	BDL		ug/L	1	
Trichloroethene	BDL		ug/L	1	
Trichlorofluoromethane	BDL		ug/L	1	
Vinyl Chloride	BDL		ug/L	1	
Xylenes (Total)	BDL		ug/L	1	

### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
1,2-Dichloroethane-d4	75-133	108
Toluene-d8	86-119	102
Bromofluorobenzene	85-116	104

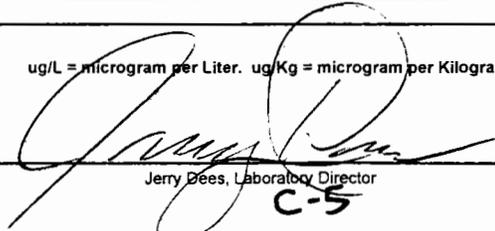
COMMENTS :

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BDL = Below Detection Limit. ug/L = microgram per Liter. ug/Kg = microgram per Kilogram. \* = FL HRS certification pending.

Approved by :

  
Jerry Dees, Laboratory Director  
C-5

Date: 5/5/97

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End of Report

# Navy Public Works Center Environmental Laboratory

Bldg. 3887, Code 920  
NAS Pensacola, FL 32508 - 6500  
Phone (904) 452-4728/3642  
DSN 922-4728/3642

Client: NPWC Environmental  
Address: Bldg. 3887, Code 910  
NAS Pensacola, FL 32508  
Phone #: 452-3180  
Contact: Greg Campbell

## Analytical Report

### 610 PAH's by Method 8270

Lab Report Number: 71501  
Sample Date: 04/14/97  
Received Date: 04/14/97  
Sample Site: NAS Pensacola, FL  
Job Order No.: 130 5001

LAB Sample ID#	1- <b>71501</b>			
Sample Name / Location	Site 23 MW-6			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0915			
Sample Type (composite or grab)	Grab			
Analyst	M. Chambers			
Date of Extraction / Initials	04/15/97 JJ			
Date of Analysis	04/17/97			
Sample Matrix	N/S			
Dilution	X 1			
<b>Compound Name</b>	<b>1- 71501</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Acenaphthene	BDL	ug/L	2	
Acenaphthylene	BDL	ug/L	2	
Anthracene	BDL	ug/L	2	
Benzo(a)anthracene	BDL	ug/L	2	
Benzo(a)pyrene	BDL	ug/L	2	
Benzo(b)fluoranthene	BDL	ug/L	2	
Benzo(g,h,i)perylene	BDL	ug/L	2	
Benzo(k)fluoranthene	BDL	ug/L	3	
Chrysene	BDL	ug/L	2	
Dibenz(a,h)anthracene	BDL	ug/L	2	
Fluoranthene	BDL	ug/L	2	
Fluorene	BDL	ug/L	2	
Indeno(1,2,3-cd)pyrene	BDL	ug/L	2	
1-Methylnaphthalene *	BDL	ug/L	2	
2-Methylnaphthalene	BDL	ug/L	3	
Naphthalene	BDL	ug/L	2	
Phenanthrene	BDL	ug/L	2	
Pyrene	BDL	ug/L	2	

### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
Nitrobenzene- d5	35-114	73
2-Fluorobiphenyl	43-116	82
Terphenyl -d14	33-141	116

COMMENTS :

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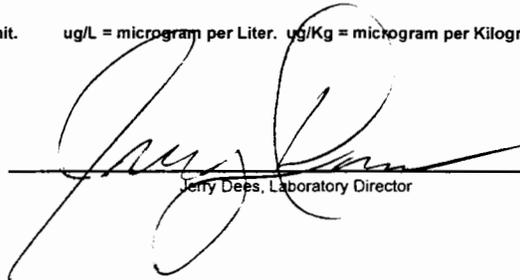
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BDL = Below Detection Limit. ug/L = microgram per Liter. ug/Kg = microgram per Kilogram. \* = FL HRS certification pending.

Approved by :

  
\_\_\_\_\_  
Jerry Dees, Laboratory Director

Date: 5/5/97

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C-6

**Navy Public Works Center  
Environmental Laboratory**

Bldg. 3887, Code 920  
NAS Pensacola, FL 32508 - 6500  
Phone (904) 452-4728/3642  
DSN 922-4728/3642

Client: NPWC Environmental  
Address: Bldg. 3887, Code 910  
NAS Pensacola, FL 32508  
Phone #: 452-3180  
Contact: Greg Campbell

**Analytical Report**

**Ethylene Dibromide by Method 504**

Lab Report Number: 71501  
Sample Date: 04/14/97  
Received Date: 04/14/97  
Sample Site: NAS Pensacola, FL  
Job Order No.: 130 5001

LAB Sample ID#	1- <b>71501</b>			
Sample Name / Location	Site 23 MW-6			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0915			
Sample Type (composite or grab)	Grab			
Analyst	J. Moore			
Date of Extraction / Initials	04/16/97 JM			
Date of Analysis	04/16/97			
Sample Matrix	N/S			
Dilution	X 1			
<b>Compound Name</b>	<b>1- 71501</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Ethylene Dibromide	BDL	ug/L	0.02	

**SURROGATE SPIKE RECOVERIES**

	Acceptance Limits	Percent Recovery
Tetra-Chloro-m-Xylene	54-140	95

COMMENTS :

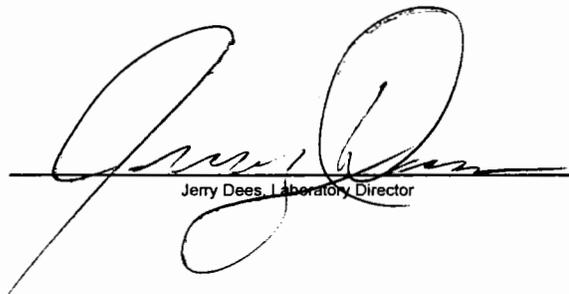
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BDL = Below Detection Limit. ug/L = microgram per Liter. ug/Kg = microgram per Kilogram.

Approved by :



Jerry Dees, Laboratory Director

Date: 5/5/97  
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**Navy Public Works Center  
Environmental Laboratory**

Bldg. 3887, Code 920  
NAS Pensacola, FL 32508 - 6500  
Phone (904) 452-4728/3642  
DSN 922-4728/3642

Client: NPWC Environmental  
Address: Bldg. 3887, Code 910  
NAS Pensacola, FL 32508  
Phone #: 452-3180  
Contact: Greg Campbell

**Analytical Report**

**Petroleum Range Organics by FLPRO**

Lab Report Number: 71501  
Sample Date: 04/14/97  
Received Date: 04/14/97  
Sample Site: NAS Pensacola, FL  
Job Order No.: 130 5001

LAB Sample ID#	1- <b>71501</b>			
Sample Name / Location	Site 23 MW-6			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0915			
Sample Type (composite or grab)	Grab			
Analyst	M. Chambers			
Date of extraction / Initials	04/22/97 MC			
Date of Analysis	04/22/97			
Sample Matrix	N/S			
Dilution	x 1			
Parameter	1- <b>71501</b>	units	Det. Limit	Flags
Petroleum Range Organics by FLPRO	BDL	mg/L	0.25	

**SURROGATE SPIKE RECOVERIES**

	Acceptance Limits	Percent Recovery
ortho-Terphenyl	82-142 *	104
Nonatriacontane (C-39)	42-193 *	91

COMMENTS : \* = Suggested surrogate recovery limits listed in the method. In-house laboratory limits are in the process of being determined.

BDL = Below Detection Limit. mg/L = milligram per Liter. mg/Kg = milligram per Kilogram.

Approved by :



Jerry Dees, Laboratory Director

Date: 5/5/97

# Navy Public Works Center

## Environmental Laboratory

Bldg. 3887, Code 920  
 NAS Pensacola, FL 32508 - 6500  
 Phone (904) 452-4728/3642  
 DSN 922-4728/3642

Client: NPWC Environmental  
 Address: Bldg. 3887, Code 910  
 NAS Pensacola, FL 32508  
 Phone #: 452-3180  
 Contact: Greg Campbell

## Analytical Report

601/602 Volatiles by Method 8260

Lab Report Number: 71502  
 Sample Date: 04/14/97  
 Received Date: 04/14/97  
 Sample Site: NAS Pensacola, FL  
 Job Order No.: 130 5001

LAB Sample ID#	1- <b>71502</b>			
Sample Name / Location	Site 23 Trip Blank			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0930			
Sample Type (composite or grab)	Grab			
Analyst	J. Moore			
Date of Extraction / Initials	04/16/97 JM			
Date of Analysis	04/16/97			
Sample Matrix	DI			
Dilution	X 1			
<b>Compound Name</b>	<b>1- 71502</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Benzene	BDL	ug/L	1	
Bromodichloromethane	BDL	ug/L	1	
Bromoform	BDL	ug/L	2	
Bromomethane	BDL	ug/L	3	
Carbon Tetrachloride	BDL	ug/L	1	
Chlorobenzene	BDL	ug/L	1	
Chloroethane	BDL	ug/L	1	
2-Chloroethylvinyl ether	BDL	ug/L	1	
Chloroform	BDL	ug/L	1	
Chloromethane	BDL	ug/L	1	
Dibromochloromethane	BDL	ug/L	1	
1,2-Dichlorobenzene	BDL	ug/L	1	
1,3-Dichlorobenzene	BDL	ug/L	1	
1,4-Dichlorobenzene	BDL	ug/L	1	
Dichlorodifluoromethane	BDL	ug/L	1	
1,1-Dichloroethane	BDL	ug/L	1	
1,2-Dichloroethane	BDL	ug/L	1	
1,1-Dichloroethene	BDL	ug/L	1	
trans-1,2-Dichloroethene	BDL	ug/L	1	
1,2-Dichloropropane	BDL	ug/L	1	
cis-1,3-Dichloropropene	BDL	ug/L	1	
trans-1,3-Dichloropropene	BDL	ug/L	1	
Ethylbenzene	BDL	ug/L	1	
Methylene Chloride	BDL	ug/L	1	
Methyl-tert-butyl ether (MTBE) *	BDL	ug/l	1	
1,1,2,2-Tetrachloroethane	BDL	ug/L	1	
Tetrachloroethene	BDL	ug/L	1	
Toluene	BDL	ug/L	1	
1,1,1-Trichloroethane	BDL	ug/L	1	
1,1,2-Trichloroethane	BDL	ug/L	1	
Trichloroethene	BDL	ug/L	1	
Trichlorofluoromethane	BDL	ug/L	1	
Vinyl Chloride	BDL	ug/L	1	
Xylenes (Total)	BDL	ug/L	1	

### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
1,2-Dichloroethane-d4	75-133	107
Toluene-d8	86-119	101
Bromofluorobenzene	85-116	103

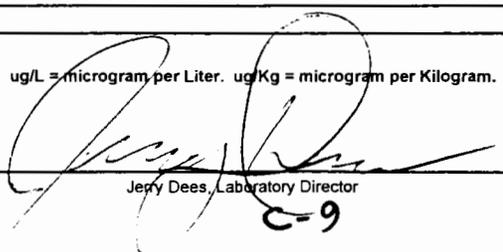
COMMENTS :

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BDL = Below Detection Limit. ug/L = microgram per Liter. ug/Kg = microgram per Kilogram. \* = FL HRS certification pending.

Approved by :

  
 Jerry Dees, Laboratory Director

Date: 5/5/97

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# Navy Public Works Center

## Environmental Laboratory

Bldg. 3887, Code 920  
 NAS Pensacola, FL 32508 - 6500  
 Phone (904) 452-4728/3642  
 DSN 922-4728/3642

Client: NPWC Environmental  
 Address: Bldg. 3887, Code 910  
 NAS Pensacola, FL 32508  
 Phone #: 452-3180  
 Contact: Greg Campbell

## Analytical Report

601/602 Volatiles by Method 8260

Lab Report Number: 71503  
 Sample Date: 04/14/97  
 Received Date: 04/14/97  
 Sample Site: NAS Pensacola, FL  
 Job Order No.: 130 5001

LAB Sample ID#	1- <b>71503</b>			
Sample Name / Location	Site 23 Duplicate			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0945			
Sample Type (composite or grab)	Grab			
Analyst	J. Moore			
Date of Extraction / Initials	04/16/97 JM			
Date of Analysis	04/16/97			
Sample Matrix	GW			
Dilution	X 1			
<b>Compound Name</b>	<b>1- 71503</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Benzene	BDL	ug/L	1	
Bromodichloromethane	BDL	ug/L	1	
Bromoform	BDL	ug/L	2	
Bromomethane	BDL	ug/L	3	
Carbon Tetrachloride	BDL	ug/L	1	
Chlorobenzene	BDL	ug/L	1	
Chloroethane	BDL	ug/L	1	
2-Chloroethylvinyl ether	BDL	ug/L	1	
Chloroform	BDL	ug/L	1	
Chloromethane	BDL	ug/L	1	
Dibromochloromethane	BDL	ug/L	1	
1,2-Dichlorobenzene	BDL	ug/L	1	
1,3-Dichlorobenzene	BDL	ug/L	1	
1,4-Dichlorobenzene	BDL	ug/L	1	
Dichlorodifluoromethane	BDL	ug/L	1	
1,1-Dichloroethane	BDL	ug/L	1	
1,2-Dichloroethane	BDL	ug/L	1	
1,1-Dichloroethene	BDL	ug/L	1	
trans-1,2-Dichloroethene	BDL	ug/L	1	
1,2-Dichloropropane	BDL	ug/L	1	
cis-1,3-Dichloropropene	BDL	ug/L	1	
trans-1,3-Dichloropropene	BDL	ug/L	1	
Ethylbenzene	BDL	ug/L	1	
Methylene Chloride	BDL	ug/L	1	
Methyl-tert-butyl ether (MTBE) *	BDL	ug/l	1	
1,1,2,2-Tetrachloroethane	BDL	ug/L	1	
Tetrachloroethene	BDL	ug/L	1	
Toluene	BDL	ug/L	1	
1,1,1-Trichloroethane	BDL	ug/L	1	
1,1,2-Trichloroethane	BDL	ug/L	1	
Trichloroethene	BDL	ug/L	1	
Trichlorofluoromethane	BDL	ug/L	1	
Vinyl Chloride	BDL	ug/L	1	
Xylenes (Total)	BDL	ug/L	1	

### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
1,2-Dichloroethane-d4	75-133	108
Toluene-d8	86-119	101
Bromofluorobenzene	85-116	104

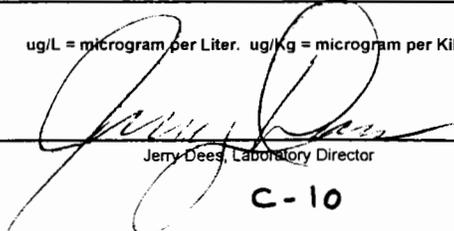
COMMENTS :

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BDL = Below Detection Limit. ug/L = microgram per Liter. ug/Kg = microgram per Kilogram. \* = FL HRS certification pending.

Approved by :

  
 \_\_\_\_\_  
 Jerry Dees, Laboratory Director

Date: 5/5/97

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# Navy Public Works Center Environmental Laboratory

Bldg. 3887, Code 920  
NAS Pensacola, FL 32508 - 6500  
Phone (904) 452-4728/3642  
DSN 922-4728/3642

Client: NPWC Environmental  
Address: Bldg. 3887, Code 910  
NAS Pensacola, FL 32508  
Phone #: 452-3180  
Contact: Greg Campbell

## Analytical Report

610 PAH's by Method 8270

Lab Report Number: 71503  
Sample Date: 04/14/97  
Received Date: 04/14/97  
Sample Site: NAS Pensacola, FL  
Job Order No.: 130 5001

LAB Sample ID#	1- <b>71503</b>			
Sample Name / Location	Site 23 Duplicate			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0945			
Sample Type (composite or grab)	Grab			
Analyst	M. Chambers			
Date of Extraction / Initials	04/15/97 JJ			
Date of Analysis	04/17/97			
Sample Matrix	GW			
Dilution	X 1			
<b>Compound Name</b>	<b>1-</b>	<b>71503</b>	<b>units</b>	<b>Det. Limit</b>
Acenaphthene	BDL		ug/L	2
Acenaphthylene	BDL		ug/L	2
Anthracene	BDL		ug/L	2
Benzo(a)anthracene	BDL		ug/L	2
Benzo(a)pyrene	BDL		ug/L	2
Benzo(b)fluoranthene	BDL		ug/L	2
Benzo(g,h,i)perylene	BDL		ug/L	2
Benzo(k)fluoranthene	BDL		ug/L	3
Chrysene	BDL		ug/L	2
Dibenz(a,h)anthracene	BDL		ug/L	2
Fluoranthene	BDL		ug/L	2
Fluorene	BDL		ug/L	2
Indeno(1,2,3-cd)pyrene	BDL		ug/L	2
1-Methylnaphthalene *	BDL		ug/L	2
2-Methylnaphthalene	BDL		ug/L	3
Naphthalene	BDL		ug/L	2
Phenanthrene	BDL		ug/L	2
Pyrene	BDL		ug/L	2

### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
Nitrobenzene- d5	35-114	73
2-Fluorobiphenyl	43-116	77
Terphenyl -d14	33-141	113

COMMENTS :

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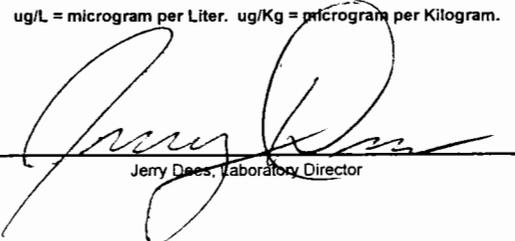
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BDL = Below Detection Limit. ug/L = microgram per Liter. ug/Kg = microgram per Kilogram. \* = FL HRS certification pending.

Approved by :

  
Jerry Dees, Laboratory Director

Date: 5/5/97

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# Navy Public Works Center

## Environmental Laboratory

Bldg. 3887, Code 920  
 NAS Pensacola, FL 32508 - 6500  
 Phone (904) 452-4728/3642  
 DSN 922-4728/3642

Client: NPWC Environmental  
 Address: Bldg. 3887, Code 910  
 NAS Pensacola, FL 32508  
 Phone #: 452-3180  
 Contact: Greg Campbell

## Analytical Report

### Ethylene Dibromide by Method 504

Lab Report Number: 71503  
 Sample Date: 04/14/97  
 Received Date: 04/14/97  
 Sample Site: NAS Pensacola, FL  
 Job Order No.: 130 5001

LAB Sample ID#	1- <b>71503</b>			
Sample Name / Location	Site 23 Duplicate			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0945			
Sample Type (composite or grab)	Grab			
Analyst	J. Moore			
Date of Extraction / Initials	04/16/97 JM			
Date of Analysis	04/16/97			
Sample Matrix	GW			
Dilution	X 1			
<b>Compound Name</b>	<b>1- 71503</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Ethylene Dibromide	BDL	ug/L	0.02	

### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
Tetra-Chloro-m-Xylene	54-140	99

COMMENTS :

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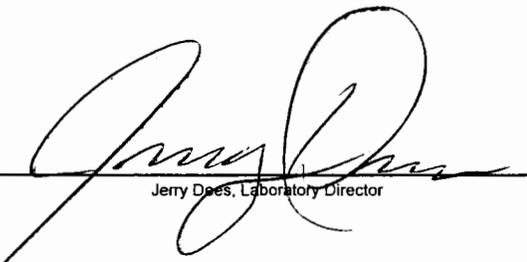
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BDL = Below Detection Limit. ug/L = microgram per Liter. ug/Kg = microgram per Kilogram.

Approved by :



Jerry Dees, Laboratory Director

Date: 5/5/97

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# Navy Public Works Center

## Environmental Laboratory

Bldg. 3887, Code 920  
 NAS Pensacola, FL 32508 - 6500  
 Phone (904) 452-4728/3642  
 DSN 922-4728/3642

Client: NPWC Environmental  
 Address: Bldg. 3887, Code 910  
 NAS Pensacola, FL 32508  
 Phone #: 452-3180  
 Contact: Greg Campbell

# Analytical Report

## Petroleum Range Organics by FLPRO

Lab Report Number: 71503  
 Sample Date: 04/14/97  
 Received Date: 04/14/97  
 Sample Site: NAS Pensacola, FL  
 Job Order No.: 130 5001

LAB Sample ID#	1- <b>71503</b>			
Sample Name / Location	Site 23 Duplicate			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0945			
Sample Type (composite or grab)	Grab			
Analyst	M. Chambers			
Date of extraction / Initials	04/22/97 MC			
Date of Analysis	04/22/97			
Sample Matrix	GW			
Dilution	x 1			
<b>Parameter</b>	<b>1- 71503</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Petroleum Range Organics by FLPRO	BDL	mg/L	0.25	

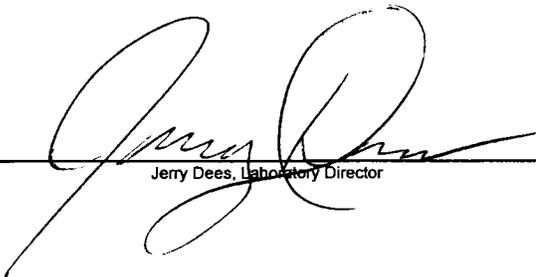
### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
ortho-Terphenyl	82-142 *	98
Nonatriacontane (C-39)	42-193 *	88

COMMENTS : \* = Suggested surrogate recovery limits listed in the method. In-house laboratory limits are in the process of being determined.

BDL = Below Detection Limit. mg/L = milligram per Liter. mg/Kg = milligram per Kilogram.

Approved by :



Jerry Dees, Laboratory Director

Date: 5/5/97

# Navy Public Works Center

## Environmental Laboratory

Bldg. 3887, Code 920  
 NAS Pensacola, FL 32508 - 6500  
 Phone (904) 452-4728/3642  
 DSN 922-4728/3642

Client: NPWC Environmental  
 Address: Bldg. 3887, Code 910  
 NAS Pensacola, FL 32508  
 Phone #: 452-3180  
 Contact: Greg Campbell

## Analytical Report

601/602 Volatiles by Method 8260

Lab Report Number: 71504  
 Sample Date: 04/14/97  
 Received Date: 04/14/97  
 Sample Site: NAS Pensacola, FL  
 Job Order No.: 130 5001

LAB Sample ID#	1- <b>71504</b>			
Sample Name / Location	Site 23 MW-1			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0800			
Sample Type (composite or grab)	Grab			
Analyst	J. Moore			
Date of Extraction / Initials	04/16/97 JM			
Date of Analysis	04/16/97			
Sample Matrix	GW			
Dilution	X 1			
<b>Compound Name</b>	<b>1- 71504</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Benzene	BDL	ug/L	1	
Bromodichloromethane	BDL	ug/L	1	
Bromoform	BDL	ug/L	2	
Bromomethane	BDL	ug/L	3	
Carbon Tetrachloride	BDL	ug/L	1	
Chlorobenzene	BDL	ug/L	1	
Chloroethane	BDL	ug/L	1	
2-Chloroethylvinyl ether	BDL	ug/L	1	
Chloroform	BDL	ug/L	1	
Chloromethane	BDL	ug/L	1	
Dibromochloromethane	BDL	ug/L	1	
1,2-Dichlorobenzene	BDL	ug/L	1	
1,3-Dichlorobenzene	BDL	ug/L	1	
1,4-Dichlorobenzene	BDL	ug/L	1	
Dichlorodifluoromethane	BDL	ug/L	1	
1,1-Dichloroethane	BDL	ug/L	1	
1,2-Dichloroethane	BDL	ug/L	1	
1,1-Dichloroethene	BDL	ug/L	1	
trans-1,2-Dichloroethene	BDL	ug/L	1	
1,2-Dichloropropane	BDL	ug/L	1	
cis-1,3-Dichloropropene	BDL	ug/L	1	
trans-1,3-Dichloropropene	BDL	ug/L	1	
Ethylbenzene	BDL	ug/L	1	
Methylene Chloride	BDL	ug/L	1	
Methyl-tert-butyl ether (MTBE) *	BDL	ug/L	1	
1,1,2,2-Tetrachloroethane	BDL	ug/L	1	
Tetrachloroethene	BDL	ug/L	1	
Toluene	BDL	ug/L	1	
1,1,1-Trichloroethane	BDL	ug/L	1	
1,1,2-Trichloroethane	BDL	ug/L	1	
Trichloroethene	BDL	ug/L	1	
Trichlorofluoromethane	BDL	ug/L	1	
Vinyl Chloride	BDL	ug/L	1	
Xylenes (Total)	BDL	ug/L	1	

### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
1,2-Dichloroethane-d4	75-133	106
Toluene-d8	86-119	102
Bromofluorobenzene	85-116	105

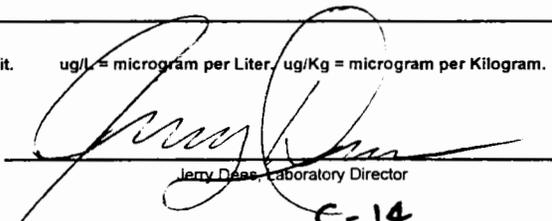
COMMENTS :

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\_\_\_\_\_

BDL = Below Detection Limit. ug/L = microgram per Liter, ug/Kg = microgram per Kilogram. \* = FL HRS certification pending.

Approved by :

  
 Jerry Deas, Laboratory Director

Date: 5/5/97

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# Navy Public Works Center

## Environmental Laboratory

Bldg. 3887, Code 920  
 NAS Pensacola, FL 32508 - 6500  
 Phone (904) 452-4728/3642  
 DSN 922-4728/3642

Client: NPWC Environmental  
 Address: Bldg. 3887, Code 910  
 NAS Pensacola, FL 32508  
 Phone #: 452-3180  
 Contact: Greg Campbell

## Analytical Report

### 610 PAH's by Method 8270

Lab Report Number: 71504  
 Sample Date: 04/14/97  
 Received Date: 04/14/97  
 Sample Site: NAS Pensacola, FL  
 Job Order No.: 130 5001

LAB Sample ID#	1- <b>71504</b>			
Sample Name / Location	Site 23 MW-1			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0800			
Sample Type (composite or grab)	Grab			
Analyst	M. Chambers			
Date of Extraction / Initials	04/15/97 JJ			
Date of Analysis	04/17/97			
Sample Matrix	GW			
Dilution	X 1			
<b>Compound Name</b>	<b>1- 71504</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Acenaphthene	BDL	ug/L	2	
Acenaphthylene	BDL	ug/L	2	
Anthracene	BDL	ug/L	2	
Benzo(a)anthracene	BDL	ug/L	2	
Benzo(a)pyrene	BDL	ug/L	2	
Benzo(b)fluoranthene	BDL	ug/L	2	
Benzo(g,h,i)perylene	BDL	ug/L	2	
Benzo(k)fluoranthene	BDL	ug/L	3	
Chrysene	BDL	ug/L	2	
Dibenz(a,h)anthracene	BDL	ug/L	2	
Fluoranthene	BDL	ug/L	2	
Fluorene	BDL	ug/L	2	
Indeno(1,2,3-cd)pyrene	BDL	ug/L	2	
1-Methylnaphthalene *	BDL	ug/L	2	
2-Methylnaphthalene	BDL	ug/L	3	
Naphthalene	BDL	ug/L	2	
Phenanthrene	BDL	ug/L	2	
Pyrene	BDL	ug/L	2	

### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
Nitrobenzene- d5	35-114	77
2-Fluorobiphenyl	43-116	87
Terphenyl -d14	33-141	99

COMMENTS :

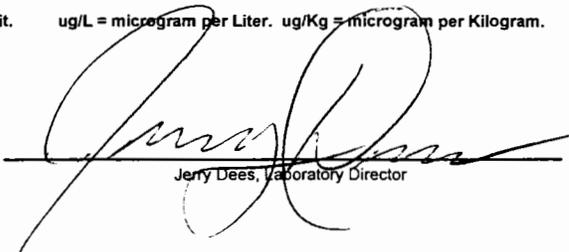
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BDL = Below Detection Limit. ug/L = microgram per Liter. ug/Kg = microgram per Kilogram. \* = FL HRS certification pending.

Approved by :



Jerry Dees, Laboratory Director

Date: 5/5/97

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# Navy Public Works Center

## Environmental Laboratory

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 DSN 922-4728/3642

Client: NPWC Environmental  
 Address: Bldg. 3887, Code 910  
 NAS Pensacola, FL 32508  
 Phone #: 452-3180  
 Contact: Greg Campbell

## Analytical Report

### Ethylene Dibromide by Method 504

Lab Report Number: 71504  
 Sample Date: 04/14/97  
 Received Date: 04/14/97  
 Sample Site: NAS Pensacola, FL  
 Job Order No.: 130 5001

LAB Sample ID#	1- <b>71504</b>			
Sample Name / Location	Site 23 MW-1			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0800			
Sample Type (composite or grab)	Grab			
Analyst	J. Moore			
Date of Extraction / Initials	04/15/97 JM			
Date of Analysis	04/15/97			
Sample Matrix	GW			
Dilution	X		1	
<b>Compound Name</b>	<b>1- 71504</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Ethylene Dibromide	BDL	ug/L	0.02	

### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
Tetra-Chloro-m-Xylene	54-140	81

COMMENTS :

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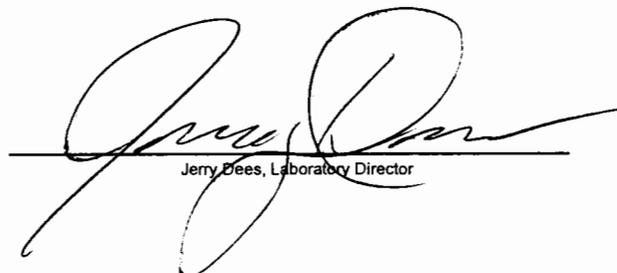
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BDL = Below Detection Limit. ug/L = microgram per Liter. ug/Kg = microgram per Kilogram.

Approved by :



Jerry Dees, Laboratory Director

Date: 5/5/97

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# Navy Public Works Center

## Environmental Laboratory

Bldg. 3887, Code 920  
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Client: NPWC Environmental  
 Address: Bldg. 3887, Code 910  
 NAS Pensacola, FL 32508  
 Phone #: 452-3180  
 Contact: Greg Campbell

# Analytical Report

## Petroleum Range Organics by FLPRO

Lab Report Number: 71504  
 Sample Date: 04/14/97  
 Received Date: 04/14/97  
 Sample Site: NAS Pensacola, FL  
 Job Order No.: 130 5001

LAB Sample ID#	1- <b>71504</b>			
Sample Name / Location	Site 23 MW-1			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0800			
Sample Type (composite or grab)	Grab			
Analyst	M. Chambers			
Date of extraction / Initials	04/22/97 MC			
Date of Analysis	04/22/97			
Sample Matrix	GW			
Dilution	x 1			
<b>Parameter</b>	<b>1- 71504</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Petroleum Range Organics by FLPRO	BDL	mg/L	0.25	

### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
ortho-Terphenyl	82-142 *	118
Nonatriacontane (C-39)	42-193 *	101

COMMENTS : \* = Suggested surrogate recovery limits listed in the method. In-house laboratory limits are in the process of being determined.

BDL = Below Detection Limit. mg/L = milligram per Liter. mg/Kg = milligram per Kilogram.

Approved by :



Jerry Dees, Laboratory Director

Date: 5/5/97

# Navy Public Works Center

## Environmental Laboratory

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 NAS Pensacola, FL 32508 - 6500  
 Phone (904) 452-4728/3642  
 DSN 922-4728/3642

Client: NPWC Environmental  
 Address: Bldg. 3887, Code 910  
 NAS Pensacola, FL 32508  
 Phone #: 452-3180  
 Contact: Greg Campbell

## Analytical Report

601/602 Volatiles by Method 8260

Lab Report Number: 71505  
 Sample Date: 04/14/97  
 Received Date: 04/14/97  
 Sample Site: NAS Pensacola, FL  
 Job Order No.: 130 5001

LAB Sample ID#	1- <b>71505</b>			
Sample Name / Location	Site 23 MW-2			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0815			
Sample Type (composite or grab)	Grab			
Analyst	J. Moore			
Date of Extraction / Initials	04/16/97 JM			
Date of Analysis	04/16/97			
Sample Matrix	GW			
Dilution	X 1			
<b>Compound Name</b>	<b>1- 71505</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Benzene	BDL	ug/L	1	
Bromodichloromethane	BDL	ug/L	1	
Bromoform	BDL	ug/L	2	
Bromomethane	BDL	ug/L	3	
Carbon Tetrachloride	BDL	ug/L	1	
Chlorobenzene	BDL	ug/L	1	
Chloroethane	BDL	ug/L	1	
2-Chloroethylvinyl ether	BDL	ug/L	1	
Chloroform	BDL	ug/L	1	
Chloromethane	BDL	ug/L	1	
Dibromochloromethane	BDL	ug/L	1	
1,2-Dichlorobenzene	BDL	ug/L	1	
1,3-Dichlorobenzene	BDL	ug/L	1	
1,4-Dichlorobenzene	BDL	ug/L	1	
Dichlorodifluoromethane	BDL	ug/L	1	
1,1-Dichloroethane	BDL	ug/L	1	
1,2-Dichloroethane	BDL	ug/L	1	
1,1-Dichloroethene	BDL	ug/L	1	
trans-1,2-Dichloroethene	BDL	ug/L	1	
1,2-Dichloropropane	BDL	ug/L	1	
cis-1,3-Dichloropropene	BDL	ug/L	1	
trans-1,3-Dichloropropene	BDL	ug/L	1	
Ethylbenzene	BDL	ug/L	1	
Methylene Chloride	BDL	ug/L	1	
Methyl-tert-butyl ether (MTBE) *	BDL	ug/L	1	
1,1,2,2-Tetrachloroethane	BDL	ug/L	1	
Tetrachloroethene	BDL	ug/L	1	
Toluene	BDL	ug/L	1	
1,1,1-Trichloroethane	BDL	ug/L	1	
1,1,2-Trichloroethane	BDL	ug/L	1	
Trichloroethene	BDL	ug/L	1	
Trichlorofluoromethane	BDL	ug/L	1	
Vinyl Chloride	BDL	ug/L	1	
Xylenes (Total)	BDL	ug/L	1	

### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
1,2-Dichloroethane-d4	75-133	109
Toluene-d8	86-119	102
Bromofluorobenzene	85-116	104

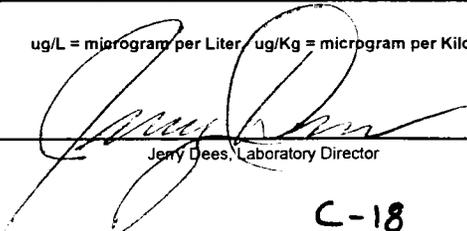
COMMENTS :

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\_\_\_\_\_

BDL = Below Detection Limit. ug/L = microgram per Liter, ug/Kg = microgram per Kilogram. \* = FL HRS certification pending.

Approved by :

  
 Jerry Dees, Laboratory Director

Date: 5/5/97

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# Navy Public Works Center

## Environmental Laboratory

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 NAS Pensacola, FL 32508 - 6500  
 Phone (904) 452-4728/3642  
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Client: NPWC Environmental  
 Address: Bldg. 3887, Code 910  
 NAS Pensacola, FL 32508  
 Phone #: 452-3180  
 Contact: Greg Campbell

## Analytical Report

### 610 PAH's by Method 8270

Lab Report Number: 71505  
 Sample Date: 04/14/97  
 Received Date: 04/14/97  
 Sample Site: NAS Pensacola, FL  
 Job Order No.: 130 5001

LAB Sample ID#	1- <b>71505</b>			
Sample Name / Location	Site 23 MW-2			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0815			
Sample Type (composite or grab)	Grab			
Analyst	M. Chambers			
Date of Extraction / Initials	04/15/97 JJ			
Date of Analysis	04/17/97			
Sample Matrix	GW			
Dilution	X 1			
<b>Compound Name</b>	<b>1- 71505</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Acenaphthene	BDL	ug/L	2	
Acenaphthylene	BDL	ug/L	2	
Anthracene	BDL	ug/L	2	
Benzo(a)anthracene	BDL	ug/L	2	
Benzo(a)pyrene	BDL	ug/L	2	
Benzo(b)fluoranthene	BDL	ug/L	2	
Benzo(g,h,i)perylene	BDL	ug/L	2	
Benzo(k)fluoranthene	BDL	ug/L	3	
Chrysene	BDL	ug/L	2	
Dibenz(a,h)anthracene	BDL	ug/L	2	
Fluoranthene	BDL	ug/L	2	
Fluorene	BDL	ug/L	2	
Indeno(1,2,3-cd)pyrene	BDL	ug/L	2	
1-Methylnaphthalene *	BDL	ug/L	2	
2-Methylnaphthalene	BDL	ug/L	3	
Naphthalene	BDL	ug/L	2	
Phenanthrene	BDL	ug/L	2	
Pyrene	BDL	ug/L	2	

### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
Nitrobenzene- d5	35-114	81
2-Fluorobiphenyl	43-116	87
Terphenyl -d14	33-141	118

COMMENTS :

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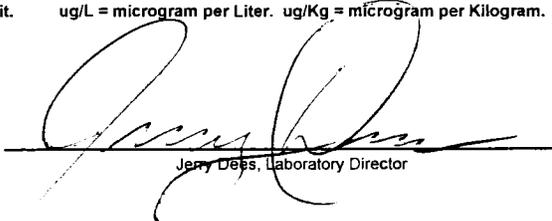
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BDL = Below Detection Limit. ug/L = microgram per Liter. ug/Kg = microgram per Kilogram. \* = FL HRS certification pending.

Approved by :



Jerry Dees, Laboratory Director

Date: 5/5/97  
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# Navy Public Works Center

## Environmental Laboratory

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 Phone (904) 452-4728/3642  
 DSN 922-4728/3642

Client: NPWC Environmental  
 Address: Bldg. 3887, Code 910  
 NAS Pensacola, FL 32508  
 Phone #: 452-3180  
 Contact: Greg Campbell

## Analytical Report

### Ethylene Dibromide by Method 504

Lab Report Number: 71505  
 Sample Date: 04/14/97  
 Received Date: 04/14/97  
 Sample Site: NAS Pensacola, FL  
 Job Order No.: 130 5001

LAB Sample ID#	1- <b>71505</b>			
Sample Name / Location	Site 23 MW-2			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0815			
Sample Type (composite or grab)	Grab			
Analyst	J. Moore			
Date of Extraction / Initials	04/15/97 JM			
Date of Analysis	04/15/97			
Sample Matrix	GW			
Dilution	X		1	
<b>Compound Name</b>	<b>1- 71505</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Ethylene Dibromide	BDL	ug/L	0.02	

### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
Tetra-Chloro-m-Xylene	54-140	75

COMMENTS :

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BDL = Below Detection Limit. ug/L = microgram per Liter. ug/Kg = microgram per Kilogram.

Approved by :



Jerry Dees, Laboratory Director

Date: 5/5/97

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# Navy Public Works Center

## Environmental Laboratory

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 DSN 922-4728/3642

Client: NPWC Environmental  
 Address: Bldg. 3887, Code 910  
 NAS Pensacola, FL 32508  
 Phone #: 452-3180  
 Contact: Greg Campbell

# Analytical Report

## Petroleum Range Organics by FLPRO

Lab Report Number: 71505  
 Sample Date: 04/14/97  
 Received Date: 04/14/97  
 Sample Site: NAS Pensacola, FL  
 Job Order No.: 130 5001

LAB Sample ID#	1- <b>71505</b>			
Sample Name / Location	Site 23 MW-2			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0815			
Sample Type (composite or grab)	Grab			
Analyst	M. Chambers			
Date of extraction / Initials	04/22/97 MC			
Date of Analysis	04/22/97			
Sample Matrix	GW			
Dilution	x 1			
<b>Parameter</b>	<b>1- 71505</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Petroleum Range Organics by FLPRO	BDL	mg/L	0.25	

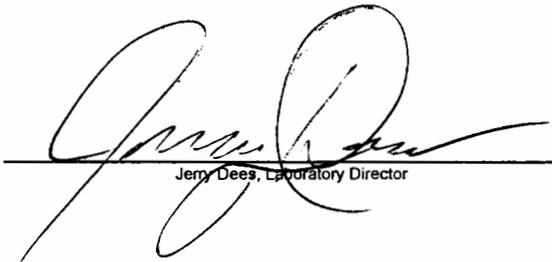
### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
ortho-Terphenyl	82-142 *	115
Nonatriacontane (C-39)	42-193 *	85

COMMENTS : \* = Suggested surrogate recovery limits listed in the method. In-house laboratory limits are in the process of being determined.

BDL = Below Detection Limit. mg/L = milligram per Liter. mg/Kg = milligram per Kilogram.

Approved by :



Jerry Dees, Laboratory Director

Date: 5/5/97

# Navy Public Works Center

## Environmental Laboratory

Bldg. 3887, Code 920  
 NAS Pensacola, FL 32508 - 6500  
 Phone (904) 452-4728/3642  
 DSN 922-4728/3642

Client: NPWC Environmental  
 Address: Bldg. 3887, Code 910  
 NAS Pensacola, FL 32508  
 Phone #: 452-3180  
 Contact: Greg Campbell

## Analytical Report

601/602 Volatiles by Method 8260

Lab Report Number: 71506  
 Sample Date: 04/14/97  
 Received Date: 04/14/97  
 Sample Site: NAS Pensacola, FL  
 Job Order No.: 130 5001

LAB Sample ID#	1- <b>71506</b>			
Sample Name / Location	Site 23 MW-3			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0830			
Sample Type (composite or grab)	Grab			
Analyst	J. Moore			
Date of Extraction / Initials	04/16/97 JM			
Date of Analysis	04/16/97			
Sample Matrix	GW			
Dilution	X 1			
<b>Compound Name</b>	<b>1- 71506</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Benzene	BDL	ug/L	1	
Bromodichloromethane	BDL	ug/L	1	
Bromoform	BDL	ug/L	2	
Bromomethane	BDL	ug/L	3	
Carbon Tetrachloride	BDL	ug/L	1	
Chlorobenzene	BDL	ug/L	1	
Chloroethane	BDL	ug/L	1	
2-Chloroethylvinyl ether	BDL	ug/L	1	
Chloroform	BDL	ug/L	1	
Chloromethane	BDL	ug/L	1	
Dibromochloromethane	BDL	ug/L	1	
1,2-Dichlorobenzene	BDL	ug/L	1	
1,3-Dichlorobenzene	BDL	ug/L	1	
1,4-Dichlorobenzene	BDL	ug/L	1	
Dichlorodifluoromethane	BDL	ug/L	1	
1,1-Dichloroethane	BDL	ug/L	1	
1,2-Dichloroethane	BDL	ug/L	1	
1,1-Dichloroethene	BDL	ug/L	1	
trans-1,2-Dichloroethene	BDL	ug/L	1	
1,2-Dichloropropane	BDL	ug/L	1	
cis-1,3-Dichloropropene	BDL	ug/L	1	
trans-1,3-Dichloropropene	BDL	ug/L	1	
Ethylbenzene	BDL	ug/L	1	
Methylene Chloride	BDL	ug/L	1	
Methyl-tert-butyl ether (MTBE) *	BDL	ug/L	1	
1,1,2,2-Tetrachloroethane	BDL	ug/L	1	
Tetrachloroethene	BDL	ug/L	1	
Toluene	BDL	ug/L	1	
1,1,1-Trichloroethane	BDL	ug/L	1	
1,1,2-Trichloroethane	BDL	ug/L	1	
Trichloroethene	BDL	ug/L	1	
Trichlorofluoromethane	BDL	ug/L	1	
Vinyl Chloride	BDL	ug/L	1	
Xylenes (Total)	BDL	ug/L	1	

### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
1,2-Dichloroethane-d4	75-133	106
Toluene-d8	86-119	102
Bromofluorobenzene	85-116	105

COMMENTS :

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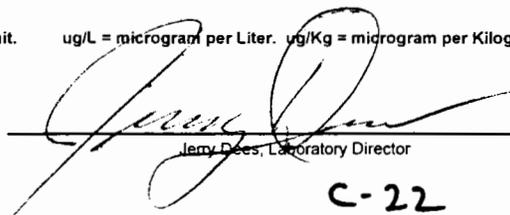
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BDL = Below Detection Limit. ug/L = microgram per Liter. ug/Kg = microgram per Kilogram. \* = FL HRS certification pending.

Approved by :

  
 Jerry Dees, Laboratory Director

Date: 5/5/97

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# Navy Public Works Center Environmental Laboratory

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NAS Pensacola, FL 32508 - 6500  
Phone (904) 452-4728/3642  
DSN 922-4728/3642

Client: NPWC Environmental  
Address: Bldg. 3887, Code 910  
NAS Pensacola, FL 32508  
Phone #: 452-3180  
Contact: Greg Campbell

## Analytical Report

610 PAH's by Method 8270

Lab Report Number: 71506  
Sample Date: 04/14/97  
Received Date: 04/14/97  
Sample Site: NAS Pensacola, FL  
Job Order No.: 130 5001

LAB Sample ID#	1- <b>71506</b>			
Sample Name / Location	Site 23 MW-3			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0830			
Sample Type (composite or grab)	Grab			
Analyst	M. Chambers			
Date of Extraction / Initials	04/15/97 JJ			
Date of Analysis	04/17/97			
Sample Matrix	GW			
Dilution	X 1			
<b>Compound Name</b>	<b>1- 71506</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Acenaphthene	BDL	ug/L	2	
Acenaphthylene	BDL	ug/L	2	
Anthracene	BDL	ug/L	2	
Benzo(a)anthracene	BDL	ug/L	2	
Benzo(a)pyrene	BDL	ug/L	2	
Benzo(b)fluoranthene	BDL	ug/L	2	
Benzo(g,h,i)perylene	BDL	ug/L	2	
Benzo(k)fluoranthene	BDL	ug/L	3	
Chrysene	BDL	ug/L	2	
Dibenz(a,h)anthracene	BDL	ug/L	2	
Fluoranthene	BDL	ug/L	2	
Fluorene	BDL	ug/L	2	
Indeno(1,2,3-cd)pyrene	BDL	ug/L	2	
1-Methylnaphthalene *	BDL	ug/L	2	
2-Methylnaphthalene	BDL	ug/L	3	
Naphthalene	BDL	ug/L	2	
Phenanthrene	BDL	ug/L	2	
Pyrene	BDL	ug/L	2	

### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
Nitrobenzene- d5	35-114	75
2-Fluorobiphenyl	43-116	84
Terphenyl -d14	33-141	111

COMMENTS :

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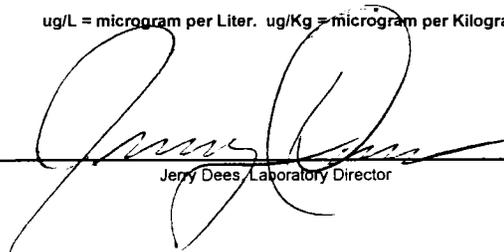
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BDL = Below Detection Limit. ug/L = microgram per Liter. ug/Kg = microgram per Kilogram. \* = FL HRS certification pending.

Approved by :



Jerry Dees, Laboratory Director

Date: 5/5/97  
Report Generated

# Navy Public Works Center

## Environmental Laboratory

Bldg. 3887, Code 920  
 NAS Pensacola, FL 32508 - 6500  
 Phone (904) 452-4728/3642  
 DSN 922-4728/3642

Client: NPWC Environmental  
 Address: Bldg. 3887, Code 910  
 NAS Pensacola, FL 32508  
 Phone #: 452-3180  
 Contact: Greg Campbell

# Analytical Report

## Ethylene Dibromide by Method 504

Lab Report Number: 71506  
 Sample Date: 04/14/97  
 Received Date: 04/14/97  
 Sample Site: NAS Pensacola, FL  
 Job Order No.: 130 5001

LAB Sample ID#	1- <b>71506</b>			
Sample Name / Location	Site 23 MW-3			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0830			
Sample Type (composite or grab)	Grab			
Analyst	J. Moore			
Date of Extraction / Initials	04/16/97 JM			
Date of Analysis	04/16/97			
Sample Matrix	GW			
Dilution	X		1	
<b>Compound Name</b>	<b>1- 71506</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Ethylene Dibromide	BDL	ug/L	0.02	

### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
Tetra-Chloro-m-Xylene	54-140	64

COMMENTS :

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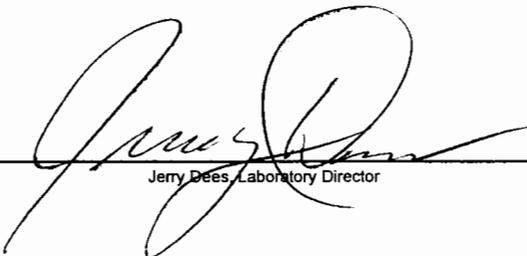
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BDL = Below Detection Limit. ug/L = microgram per Liter. ug/Kg = microgram per Kilogram.

Approved by :



Jerry Dees, Laboratory Director

Date: 5/5/97  
 Report Generated

**Navy Public Works Center  
Environmental Laboratory**

Bldg. 3887, Code 920  
NAS Pensacola, FL 32508 - 6500  
Phone (904) 452-4728/3642  
DSN 922-4728/3642

Client: NPWC Environmental  
Address: Bldg. 3887, Code 910  
NAS Pensacola, FL 32508  
Phone #: 452-3180  
Contact: Greg Campbell

**Analytical Report**

**Petroleum Range Organics by FLPRO**

Lab Report Number: 71506  
Sample Date: 04/14/97  
Received Date: 04/14/97  
Sample Site: NAS Pensacola, FL  
Job Order No.: 130 5001

LAB Sample ID#	1- <b>71506</b>			
Sample Name / Location	Site 23 MW-3			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0830			
Sample Type (composite or grab)	Grab			
Analyst	M. Chambers			
Date of extraction / Initials	04/22/97 MC			
Date of Analysis	04/22/97			
Sample Matrix	GW			
Dilution	x 1			
<b>Parameter</b>	<b>1- 71506</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Petroleum Range Organics by FLPRO	BDL	mg/L	0.25	

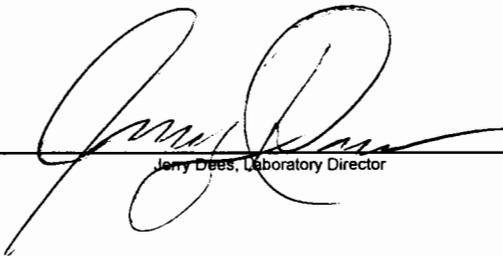
**SURROGATE SPIKE RECOVERIES**

	Acceptance Limits	Percent Recovery
ortho-Terphenyl	82-142 *	120
Nonatriacontane (C-39)	42-193 *	89

COMMENTS : \* = Suggested surrogate recovery limits listed in the method. In-house laboratory limits are in the process of being determined.

BDL = Below Detection Limit. mg/L = milligram per Liter. mg/Kg = milligram per Kilogram.

Approved by :



Jerry Dees, Laboratory Director

Date: 5/5/97

# Navy Public Works Center

## Environmental Laboratory

Bldg. 3887, Code 920  
 NAS Pensacola, FL 32508 - 6500  
 Phone (904) 452-4728/3642  
 DSN 922-4728/3642

Client: NPWC Environmental  
 Address: Bldg. 3887, Code 910  
 NAS Pensacola, FL 32508  
 Phone #: 452-3180  
 Contact: Greg Campbell

## Analytical Report

601/602 Volatiles by Method 8260

Lab Report Number: 71507  
 Sample Date: 04/14/97  
 Received Date: 04/14/97  
 Sample Site: NAS Pensacola, FL  
 Job Order No.: 130 5001

LAB Sample ID#	1- <b>71507</b>			
Sample Name / Location	Site 23 MW-4			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0845			
Sample Type (composite or grab)	Grab			
Analyst	J. Moore			
Date of Extraction / Initials	04/17/97 JM			
Date of Analysis	04/17/97			
Sample Matrix	GW			
Dilution	X 1			
<b>Compound Name</b>	<b>1- 71507</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Benzene	BDL	ug/L	1	
Bromodichloromethane	BDL	ug/L	1	
Bromoform	BDL	ug/L	2	
Bromomethane	BDL	ug/L	3	
Carbon Tetrachloride	BDL	ug/L	1	
Chlorobenzene	BDL	ug/L	1	
Chloroethane	BDL	ug/L	1	
2-Chloroethylvinyl ether	BDL	ug/L	1	
Chloroform	BDL	ug/L	1	
Chloromethane	BDL	ug/L	1	
Dibromochloromethane	BDL	ug/L	1	
1,2-Dichlorobenzene	BDL	ug/L	1	
1,3-Dichlorobenzene	BDL	ug/L	1	
1,4-Dichlorobenzene	BDL	ug/L	1	
Dichlorodifluoromethane	BDL	ug/L	1	
1,1-Dichloroethane	BDL	ug/L	1	
1,2-Dichloroethane	BDL	ug/L	1	
1,1-Dichloroethene	BDL	ug/L	1	
trans-1,2-Dichloroethene	BDL	ug/L	1	
1,2-Dichloropropane	BDL	ug/L	1	
cis-1,3-Dichloropropene	BDL	ug/L	1	
trans-1,3-Dichloropropene	BDL	ug/L	1	
Ethylbenzene	BDL	ug/L	1	
Methylene Chloride	BDL	ug/L	1	
Methyl-tert-butyl ether (MTBE) *	BDL	ug/L	1	
1,1,2,2-Tetrachloroethane	BDL	ug/L	1	
Tetrachloroethene	BDL	ug/L	1	
Toluene	BDL	ug/L	1	
1,1,1-Trichloroethane	BDL	ug/L	1	
1,1,2-Trichloroethane	BDL	ug/L	1	
Trichloroethene	BDL	ug/L	1	
Trichlorofluoromethane	BDL	ug/L	1	
Vinyl Chloride	BDL	ug/L	1	
Xylenes (Total)	BDL	ug/L	1	

### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
1,2-Dichloroethane-d4	75-133	110
Toluene-d8	86-119	103
Bromofluorobenzene	85-116	103

COMMENTS :

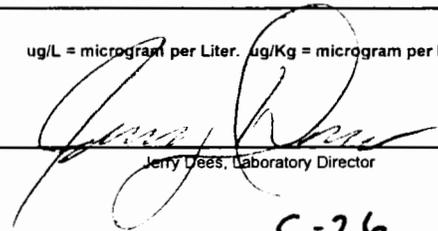
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\_\_\_\_\_

BDL = Below Detection Limit. ug/L = microgram per Liter. ug/Kg = microgram per Kilogram. \* = FL HRS certification pending.

Approved by :

  
 Jerry Dees, Laboratory Director

Date: 5/5/97

Report Generated

# Navy Public Works Center Environmental Laboratory

Bldg. 3887, Code 920  
NAS Pensacola, FL 32508 - 6500  
Phone (904) 452-4728/3642  
DSN 922-4728/3642

Client: NPWC Environmental  
Address: Bldg. 3887, Code 910  
NAS Pensacola, FL 32508  
Phone #: 452-3180  
Contact: Greg Campbell

## Analytical Report

### 610 PAH's by Method 8270

Lab Report Number: 71507  
Sample Date: 04/14/97  
Received Date: 04/14/97  
Sample Site: NAS Pensacola, FL  
Job Order No.: 130 5001

LAB Sample ID#	1- <b>71507</b>			
Sample Name / Location	Site 23 MW-4			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0845			
Sample Type (composite or grab)	Grab			
Analyst	M. Chambers			
Date of Extraction / Initials	04/15/97 JJ			
Date of Analysis	04/17/97			
Sample Matrix	GW			
Dilution	X 1			
<b>Compound Name</b>	<b>1- 71507</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Acenaphthene	BDL	ug/L	2	
Acenaphthylene	BDL	ug/L	2	
Anthracene	BDL	ug/L	2	
Benzo(a)anthracene	BDL	ug/L	2	
Benzo(a)pyrene	BDL	ug/L	2	
Benzo(b)fluoranthene	BDL	ug/L	2	
Benzo(g,h,i)perylene	BDL	ug/L	2	
Benzo(k)fluoranthene	BDL	ug/L	3	
Chrysene	BDL	ug/L	2	
Dibenz(a,h)anthracene	BDL	ug/L	2	
Fluoranthene	BDL	ug/L	2	
Fluorene	BDL	ug/L	2	
Indeno(1,2,3-cd)pyrene	BDL	ug/L	2	
1-Methylnaphthalene *	BDL	ug/L	2	
2-Methylnaphthalene	BDL	ug/L	3	
Naphthalene	BDL	ug/L	2	
Phenanthrene	BDL	ug/L	2	
Pyrene	BDL	ug/L	2	

#### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
Nitrobenzene- d5	35-114	79
2-Fluorobiphenyl	43-116	95
Terphenyl -d14	33-141	123

COMMENTS :

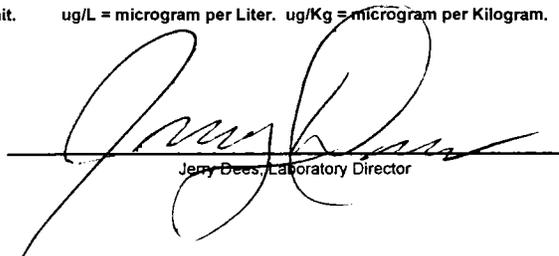
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BDL = Below Detection Limit. ug/L = microgram per Liter. ug/Kg = microgram per Kilogram. \* = FL HRS certification pending.

Approved by :



Jerry Dees, Laboratory Director

Date: 5/5/97

Report Generated

# Navy Public Works Center Environmental Laboratory

Bldg.3887, Code 440  
NAS Pensacola, FL 32508  
Phone (850) 452-3180/3642  
DSN 922-3180/3642

**Requester:** NPWC Engineering  
**Address:** Bldg. 458, Code 400  
NAS Pensacola, FL 32508  
**Phone #:** 452-4315  
**Contact:** Greg Campbell

# Laboratory Report

Lead in Water by Method 239.2

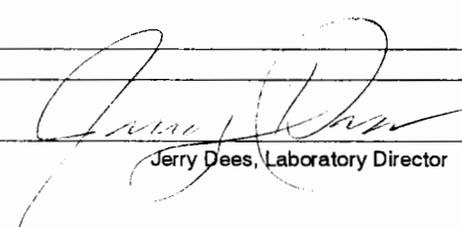
**Lab ID Number:** 9709045  
**Sample Date:** 12 Sep 97  
**Received Date:** 12 Sep 97  
**Sample Site:** NAS Pensacola, Site #23  
**Job Order #:** 130 5001

Sample ID#	Lab	1- 74096			2- 74097			3- 74098			4- 74099			Analyst(s):				
Sample Name	Requester	Site #23, MW-1			Site #23, MW-2			Site #23, MW-3			Site #23, MW-4			Brian Nelson				
Collector Name		P. Keane																
Date/Time Collected (Military)	Comp start													Date(s) of analysis:				
	Comp stop														19 Sep 97			
	Grab	12 Sep 97	@	1026	12 Sep 97	@	1100	12 Sep 97	@	1210	12 Sep 97	@	1300					
Sample Type	Comp/Grab	Grab			Grab			Grab			Grab							
Sample Matrix		Groundwater			Groundwater			Groundwater			Groundwater							
PARAMETER		ID#	units	Det. Limit	Preservative(s)													
Metals:	METHOD #	1-	74096		2-	74097		3-	74098		4-	74099						
Lead(Pb)	EPA 239.2	X	BDL	mg/l	0.003	X	BDL	mg/l	0.003	X	BDL	mg/l	0.003	X	BDL	mg/l	0.003	HNO <sub>3</sub> to pH<2

Sample ID#	Lab	5- 74100			6- 74101			7- 74102			8-			Analyst(s):				
Sample Name	Requester	Site #23, Duplicate			Site #23, MW-5			Site #23, MW-6						Brian Nelson				
Collector Name		P. Keane			P. Keane			P. Keane										
Date/Time Collected (Military)	Comp start													Date(s) of analysis:				
	Comp stop														19 Sep 97			
	Grab	12 Sep 97	@	NS	12 Sep 97	@	1345	12 Sep 97	@	1450								
Sample Type	Comp/Grab	Grab			Grab			Grab										
Sample Matrix		Groundwater			Groundwater			Groundwater										
PARAMETER		ID#	units	Det. Limit	ID#	units	Det. Limit	ID#	units	Det. Limit	ID#	units	Det. Limit	Preservative(s)				
Metals:	METHOD #	5-	74100		6-	74101		7-	74102		8-							
Lead(Pb)	EPA 239.2	X	BDL	mg/l	0.003	X	BDL	mg/l	0.003	X	0.004	mg/l	0.003	X		mg/l	0.003	HNO <sub>3</sub> to pH<2

Comments: mg/l=milligrams per liter.

Approved by: \_\_\_\_\_



Jerry Dees, Laboratory Director

Date/Time: 24-Sep-97 14:32

C-28

10/2

### CHAIN OF CUSTODY/REQUEST FOR ANALYSIS (UST Projects)

WC Environmental Laboratory  
 Bldg. 3887, Code 920  
 NAS Pensacola, Fl. 32508  
 Phone - (904) 452-4728/3642  
 DSN 922-4728/3642  
 FAX (904) 452-2799/2387

Requester: NPAC ENGINEER CODE 400  
 Address: NAS PENSACOLA, FL  
 Phone #: 482-4315  
 Contact: GREG CAMPBELL  
 Job Order #: 1305001

Report Required? (Yes) No    QC Required? Yes No  
 Lab ID Number: \_\_\_\_\_  
 Sample Date: 9/12/97  
 Received Date: 9/12/97  
 Sample Site: NAS PENSACOLA, FL SITE #23  
 Lab Due Date: \_\_\_\_\_

Sample ID #	Lab	01-7-4096	02-7-4097	03-7-4098	04-7-4099	Notes:
Sample Name		Site #23	Site #23	Site #23	Site #23	NAS SITE #23 QUIESCENT SAMPLES
or Location		MW #1	MW #2	MW #3	MW #4	
Sampled by		Phane	Phane	Phane	Phane	
Composite	Begin	/	/	/	/	
Date/Time	Frequency	/	/	/	/	
Collected	End	/	/	/	/	
Grab Time		1026	1100	1210	1300	
Sample Matrix		GW	GW	GW	GW	

PARAMETER by Method Name	METHOD #	X	1-1 Bottle ID #'s	X	1-1 Bottle ID #'s	X	1-1 Bottle ID #'s	X	Bottle ID #'s	Billing Units	Containers Required	Preservative(s) Used
Ethylene Dibromide (EDB)	EPA 504									3	120ml A VOA/4 oz.	None/4° C
Purg. Halocarbons/GC	EPA 601									4	40 ml VOA Vial x 2	HCl/4° C
Purg. Aromatics/GC	EPA 602									3	40 ml VOA Vial x 2	HCl/4° C
Purg. Halo. & Aro./GC	EPA 601/602									6	40 ml VOA Vial x 2	HCl/4° C
Polynuclear Aromatics/HPLC	EPA 610									7	1L Amber x 2	4° C
Purgeables/GCMS	EPA 624									6	40 ml VOA Vial x 2	HCl/4° C
Acids/Neutrals & Acids/GCMS	EPA 625									15	1L Amber x 2	4° C
GC Chromatography	EPA SW 8000									5	40ml 2/1Lx2/4 oz.	HCl/4° C/None
Halo. Vol. Org./GC	EPA SW 8010									4	40ml VOAx2/4 oz.	HCl/4° C/None
Non-Halo. Vol. Org./GC	EPA SW 8015(MOD)									4	40ml 2/1Lx2/4 oz.	HCl/4° C/None
Arom. Vol. Org./GC	EPA SW 8020									3	40ml VOAx2/4 oz.	HCl/4° C/None
Halo./Arom. Vol. Org./GC	EPA SW 8010/8020									6	40ml VOAx2/4 oz.	HCl/4° C/None
Polynuclear Aromatics/GC	EPA SW 8100									6	1Lx2/4 oz.	4° C/None
VOC/GCMS	EPA SW 8240A									6	40ml VOAx2/4 oz.	HCl/4° C/None
VOC/GCMS-Cap.	EPA SW 8260									6	40ml VOAx2/4 oz.	HCl/4° C/None
Semivol. Org. /GCMS-Cap.	EPA SW 8270A									16	1Lx3/4 oz.	4° C/None
Polynuclear Aromatics (PAHs)	EPA SW 8310									9	1Lx3/4 oz.	4° C/None

PARAMETER by Group Name	METHOD SOURCE	X	Bottle ID #'s	Billing Units	Containers Required	Preservative(s) Used						
Gasoline Analytical Group	EPA SW-846									47	Consult Lab	Consult Lab
Kerosene Analytical Group	EPA SW-846									39	Consult Lab	Consult Lab
Mixed Product Analytical Group	EPA SW-846									24	Consult Lab	Consult Lab
Total Petroleum Hydrocarbons	EPA 418.1									2	Consult Lab	Consult Lab
Total Petroleum Hydrocarbons	FL-PRO									7	Consult Lab	Consult Lab
RCRA Metals (6)	EPA Various									6	Consult Lab	Consult Lab
TCLP Metals (6) w/extraction	EPA SW-846									10	Consult Lab	Consult Lab
Lead (Pb) only	EPA 239.2	X	1 BOTTLE	1	250ml/4 oz.	HNO <sub>3</sub> /None						
Other:												

Comments: all samples very clean

Relinquished by: Phane  
 Date/Time: 9/12/97

Received by: Phane  
 Date/Time: 9/12/97

c:\12324\forms\custody\ust10 wk1 rev 0 1/28/96

Departed Site #23  
1500

Time to Lab - 1520

2012

CHAIN OF CUSTODY/REQUEST FOR ANALYSIS (UST Projects)

WC Environmental Laboratory  
Jg. 3887, Code 920  
NAS Pensacola, Fl. 32508  
Phone - (904) 452-4728/3642  
DSN 922-4728/3642  
FAX (904) 452-2799/2387

Requester: NAVC ENGINEER CODE 400  
Address: NAS PENSACOLA, FL  
Phone #: 452-4315  
Contact: GREG CAMPBELL  
Job Order #: 1305001

Report Required?  Yes  No    QC Required?  Yes  No  
Lab ID Number: \_\_\_\_\_  
Sample Date: 9/12/97  
Received Date: 9/12/97  
Sample Site: NAS PENSACOLA, FL  
Lab Due Date: \_\_\_\_\_

Sample ID #	Lab	#1-74000	#2-74101	#3-74102	#4-	Notes:						
Sample Name	-----	SITE #23	Site 23	Site 23		NAS SITE #23  QUIESCENT SAMPLES						
or Location	-----	Duplicate	MW # 5	MW # 6								
Sampled by	-----	Blank	Blank	Blank								
Composite	Begin	/	/	/								
Date/Time	Frequency	/	/	/								
Collected	End	/	/	/								
Grab Time	-----		1345	1450								
Sample Matrix	-----	GW	GW	GW								
PARAMETER by Method Name	METHOD #	X	1-1 Bottle ID #'s	X	1-1 Bottle ID #'s	X	Bottle ID #'s	X	Bottle ID #'s	Billing Units	Containers Required	Preservative(s) Used
Ethylene Dibromide (EDB)	EPA 504									3	120ml A VOA/4 oz.	None/4° C
Purg. Halocarbons/GC	EPA 601									4	40 ml VOA Vial x 2	HCl/4° C
Purg. Aromatics/GC	EPA 602									3	40 ml VOA Vial x 2	HCl/4° C
Purg. Halo. & Aro./GC	EPA 601/602									6	40 ml VOA Vial x 2	HCl/4° C
Polynuclear Aromatics/HPLC	EPA 610									7	1L Amber x 2	4° C
Purgeables/GCMS	EPA 624									8	40 ml VOA Vial x 2	HCl/4° C
Base/Neutrals & Acids/GCMS	EPA 625									15	1L Amber x 2	4° C
Chromatography	EPA SW 8000									5	40mb2/1Lx2/4 oz.	HCl/4° C/None
Halo. Vol. Org./GC	EPA SW 8010									4	40ml VOAx2/4 oz.	HCl/4° C/None
Non-Halo. Vol. Org./GC	EPA SW 8015(MOD)									4	40mb2/1Lx2/4 oz.	HCl/4° C/None
Arom. Vol. Org./GC	EPA SW 8020									3	40ml VOAx2/4 oz.	HCl/4° C/None
Halo./Arom. Vol. Org./GC	EPA SW 8010/8020									6	40ml VOAx2/4 oz.	HCl/4° C/None
Polynuclear Aromatics/GC	EPA SW 8100									6	1Lx2/4 oz.	4° C/None
VOC/GCMS	EPA SW 8240A									8	40ml VOAx2/4 oz.	HCl/4° C/None
VOC/GCMS-Cap.	EPA SW 8260									8	40ml VOAx2/4 oz.	HCl/4° C/None
Semivol. Org./GCMS-Cap.	EPA SW 8270A									16	1Lx3/4 oz.	4° C/None
Polynuclear Aromatics (PAHs)	EPA SW 8310									9	1Lx3/4 oz.	4° C/None
PARAMETER by Group Name	METHOD SOURCE	X	Bottle ID #'s	X	Bottle ID #'s	X	Bottle ID #'s	X	Bottle ID #'s	Billing Units	Containers Required	Preservative(s) Used
Gasoline Analytical Group	EPA SW-846									47	Consult Lab	Consult Lab
Kerosene Analytical Group	EPA SW-846									39	Consult Lab	Consult Lab
Mixed Product Analytical Group	EPA SW-846									24	Consult Lab	Consult Lab
Total Petroleum Hydrocarbons	EPA 418.1									2	Consult Lab	Consult Lab
Total Petroleum Hydrocarbons	FL-PRO									7	Consult Lab	Consult Lab
RCRA Metals (6)	EPA Various									6	Consult Lab	Consult Lab
TCLP Metals (6) w/extraction	EPA SW-846									10	Consult Lab	Consult Lab
Lead (Pb) only	EPA 239.2	X	1 BOTTLE	X	1 BOTTLE	X	1 BOTTLE			1	250ml/4 oz.	HNO <sub>3</sub> /None
Other:												

Comments: all samples very clean

Relinquished by: [Signature]  
Date/Time: 9/12/97

Received by: [Signature]  
Date/Time: 9/12/97

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Departed Site #23  
1500

Time to lab - 1530

**Navy Public Works Center  
Environmental Laboratory**

Bldg. 3887, Code 920  
NAS Pensacola, FL 32508 - 6500  
Phone (904) 452-4728/3642  
DSN 922-4728/3642

Client: NPWC Environmental  
Address: Bldg. 3887, Code 910  
NAS Pensacola, FL 32508  
Phone #: 452-3180  
Contact: Greg Campbell

**Analytical Report**

**Ethylene Dibromide by Method 504**

Lab Report Number: 71507  
Sample Date: 04/14/97  
Received Date: 04/14/97  
Sample Site: NAS Pensacola, FL  
Job Order No.: 130 5001

LAB Sample ID#	1- <b>71507</b>			
Sample Name / Location	Site 23 MW-4			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0845			
Sample Type (composite or grab)	Grab			
Analyst	J. Moore			
Date of Extraction / Initials	04/16/97 JM			
Date of Analysis	04/16/97			
Sample Matrix	GW			
Dilution	X		1	
<b>Compound Name</b>	<b>1- 71507</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Ethylene Dibromide	BDL	ug/L	0.02	

**SURROGATE SPIKE RECOVERIES**

	Acceptance Limits	Percent Recovery
Tetra-Chloro-m-Xylene	54-140	99

COMMENTS :

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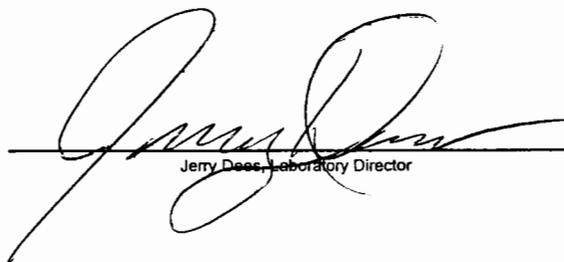
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BDL = Below Detection Limit. ug/L = microgram per Liter. ug/Kg = microgram per Kilogram.

Approved by :



Jerry Dees, Laboratory Director

Date: 5/5/97  
Report Generated

# Navy Public Works Center

## Environmental Laboratory

Bldg. 3887, Code 920  
 NAS Pensacola, FL 32508 - 6500  
 Phone (904) 452-4728/3642  
 DSN 922-4728/3642

Client: NPWC Environmental  
 Address: Bldg. 3887, Code 910  
 NAS Pensacola, FL 32508  
 Phone #: 452-3180  
 Contact: Greg Campbell

# Analytical Report

## Petroleum Range Organics by FLPRO

Lab Report Number: 71507  
 Sample Date: 04/14/97  
 Received Date: 04/14/97  
 Sample Site: NAS Pensacola, FL  
 Job Order No.: 130 5001

LAB Sample ID#	1- <b>71507</b>			
Sample Name / Location	Site 23 MW-4			
Collector's Name	MWH			
Date & Time Collected	04/14/97 @ 0845			
Sample Type (composite or grab)	Grab			
Analyst	M. Chambers			
Date of extraction / Initials	04/22/97 MC			
Date of Analysis	04/22/97			
Sample Matrix	GW			
Dilution	x 1			
<b>Parameter</b>	<b>1- 71507</b>	<b>units</b>	<b>Det. Limit</b>	<b>Flags</b>
Petroleum Range Organics by FLPRO	BDL	mg/L	0.25	

### SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
ortho-Terphenyl	82-142 *	120
Nonatriacontane (C-39)	42-193 *	82

COMMENTS : \* = Suggested surrogate recovery limits listed in the method. In-house laboratory limits are in the process of being determined.

BDL = Below Detection Limit. mg/L = milligram per Liter. mg/Kg = milligram per Kilogram.

Approved by :



Jerry Dees, Laboratory Director

Date: 5/5/97

# UST CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

NPWC Environmental Laboratory

Bldg. 3287, Code 829

NAS Pensacola, FL 32508-6500

Ph# - (904) 452-4728

Autovox - 822-4728

Requestor:

Address:

Phone #:

Contact:

Job Order #:

NPWC Environmental Dept.

Bldg. 3691, Code 910

NAS Pensacola, FL 32508

(904) 452-3180

Greg Campbell

1305001

Report Required?

Yes No DEP? Yes No

Lab ID Number:

Sample Date:

Received Date:

Sample S&C:

Lab Due Date:

4-13-97  
4-13-97  
NAS-23

Notes:

KAG

LESS Pb

Sample ID #	Lab	01-7-1500	02-7-1501	03-7-1502	04-7-1503	Notes:						
Sample Name or Location		NAS-23 M W.5	NAS-23 MW-6	NAS-23 Trip Blank	NAS-23 Duplicate	KAG						
Sampled by						LESS Pb						
Compos	Begin											
Date/Time	Frequency											
Collected	End											
Grab Time		9:00	9:15	9:30	9:45							
Sample Matrix												
PARAMETER by Method Name	METHOD #	X	Bottle ID #'s	X	Bottle ID #'s	X	Bottle ID #'s	X	Bottle ID #'s	Billing Units	Containers Required	Preservative(s) Used
Ethylene Dibromide (EDB)	EPA 504	X	2 EDB	X	2 EDB			X	2 EDB	3	120ml A VOA/4 oz.	None/4°C
Purg. Halocarbons/GC	EPA 801									4	40 ml VOA Vial x 2	HCV4°C
Purg. Aromatics/GC	EPA 802									3	40 ml VOA Vial x 2	HCV4°C
Purg. Halo. & Aro./GC	EPA 801/802	X	4-VOA	X	4-VOA	X	2-VOA	X	4-VOA	8	40 ml VOA Vial x 2	HCV4°C
Polynuclear Aromatics/HPLC	EPA 810									7	1L Amber x 2	4°C
Perylene/GCMS	EPA 824									8	40 ml VOA Vial x 2	HCV4°C
Benzofurans & Acids/GCMS	EPA 823									15	1L Amber x 2	4°C
Gas Chromatography	EPA SW 8000									5	40ml 2/1Lx2/4 oz.	HCV4°C/None
Halo. Vol. Org./GC	EPA SW 8010									4	40ml VOAx2/4 oz.	HCV4°C/None
Non-Halo. Vol. Org./GC	EPA SW 8015(MOD)									4	40ml 2/1Lx2/4 oz.	HCV4°C/None
Aro. Vol. Org./GC	EPA SW 8020									3	40ml VOAx2/4 oz.	HCV4°C/None
Halo./Aro. Vol. Org./GC	EPA SW 8010/8020									8	40ml VOAx2/4 oz.	HCV4°C/None
Polynuclear Aromatics/GC	EPA SW 8100									8	1Lx2/4 oz.	4°C/None
VOCGCMS	EPA SW 8210A									8	40ml VOAx2/4 oz.	HCV4°C/None
VOCGCMS - Cap.	EPA SW 8280									8	40ml VOAx2/4 oz.	HCV4°C/None
Semivol. Org./GCMS - Cap.	EPA SW 8270A									18	1Lx2/4 oz.	4°C/None
Polynuclear Aromatics (PAHs)	EPA SW 8310	X	2-PAH	X	2-PAH			X	2-PAH		1Lx2/4 oz.	4°C/None
PARAMETER by Group Name	METHOD	X	Bottle ID #'s	X	Bottle ID #'s	X	Bottle ID #'s	X	Bottle ID #'s	Billing Units	Containers Required	Preservative(s) Used
Gasoline Analytical Group	EPA SW-648										Consult Lab	Consult Lab
Kerosene Analytical Group	EPA SW-648										Consult Lab	Consult Lab
Mixed Product Analytical Group	EPA SW-648										Consult Lab	Consult Lab
Total Petroleum Hydrocarbons	EL-EPA-8464	X	2-TPH	X	2-TPH			X	2-TPH		Consult Lab	Consult Lab
NCPA Metals (8)	EPA Various										Consult Lab	Consult Lab
TCLP Metals (8) w/ extraction	EPA SW-648										Consult Lab	Consult Lab
Lead (Pb)	EPA-238.2										250ml 4 oz.	1HNO <sub>3</sub> /None
Other:												

Comments:

Relinquished by:

Date/Time:

MARK BAIRDEN  
4-13-97 1250

Received by:

Date/Time:

RE Thompson  
4/14/97 1250

NPWC 25108