N60508.AR.002412
NAS WHITING FIELD
5090.3a

PHASE IIA REMEDIAL INVESTIGATION DATA RELEASE FOR PIEZOCONE PENETROMETER TESTS AND IN-SITU BENGT-ARNE-TORSTENSSON (BAT) GROUNDWATER SAMPLING NAS WHITING FIELD FL

6/1/1993

40

PHASE II-A REMEDIAL INVESTIGATION DATA RELEASE

Piezocone Penetrometer Tests and In-Situ Bengt-Arne-Torstensson (BAT) Groundwater Sampling

Naval Air Station Whiting Field
Milton, Florida

June 1993

TABLE OF CONTENTS

Section	Title	Page No.
1.0	INTRODUCTION	1
2.0	PIEZOCONE PENETROMETER TEST (PCPT) EXPLORATION AND BENGT-ARNE-TORSTENSSON (BAT) GROUNDWATER SAMPLING OBJECTIVES	1
3.0	PCPT EXPLORATIONS	1
3.1	PCPT METHODOLOGY	1
3.2	SUMMARY OF PCPT EXPLORATIONS	1
4.0	BAT GROUNDWATER SAMPLING	4
4.1	BAT METHODOLOGY	4
4.2	SUMMARY OF BAT GROUNDWATER SAMPLING PROGRAM	4
5.0	INTERPRETATION OF THE VOLATILE ORGANIC COMPOUND (VOC) ANALYSIS RESULTS	4
5.1	VOC RESULTS IN THE WATER TABLE SAMPLES	6
5.2	VOC RESULTS FROM THE PRODUCTION ZONE GROUNDWATER SAMPLES	6
6.0	SUMMARY	10

Appendix A: PCPT Sounding Logs

LIST OF FIGURES

Figure	Title	Page No.
1	Phase II-A RI PCPT/BAT Locations	2

LIST OF TABLES

Table	Title	Page No.
1	Summary of PCPT Soundings	3
2	BAT Groundwater Sampling Summary	5
3	Summary of Shallow BAT Groundwater Sample Analytical Results	7
4	Summary of Deep BAT Groundwater Sample Analytical Results	8
5	Summary of QC BAT Groundwater Sample Analytical Results	9

GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
ASTM	American Society for Testing and Materials
AVGAS	aviation gasoline
BAT	Bengt-Arne-Torstensson
bls	below land surface
CRDL	contract required detection limit
DCA	dichloroethane
1,2-DCE	1,2-dichloroethene
DQOs	data quality objectives
ID	inside diameter
MCLs	maximum contaminant levels
$\mu g/\ell$	micrograms per liter
NAS	Naval Air Station
NEESA	Naval Energy and Environmental Support Activity
PCPT	piezocone penetrometer test
QC	quality control
RI	Remedial Investigation
TCE	trichloroethene
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compounds

1.0 INTRODUCTION

A piezocone penetrometer test (PCPT) exploration and Bengt-Arne-Torstensson (BAT) groundwater sampling program were conducted at Naval Air Station (NAS) Whiting Field between October 12 and November 2, 1992. Williams Earth Sciences of Clearwater, Florida, under the supervision of ABB Environmental Services, Inc. (ABB-ES), personnel, performed the PCPT soundings and collected the BAT groundwater samples.

2.0 PIEZOCONE PENETROMETER TEST (PCPT) EXPLORATION AND BENGT-ARNE-TORSTENSSON (BAT) GROUNDWATER SAMPLING OBJECTIVES

The objective of the PCPT exploration program at NAS Whiting Field was to define the stratigraphy and determine shallow and deep BAT groundwater sampling depths at each sounding location.

Groundwater samples were collected to determine whether observed groundwater contamination in the industrial area is migrating toward Clear Creek and Site 15 (Southwest Landfill) and Site 16 (Open Disposal and Burn Area).

3.0 PCPT EXPLORATIONS

3.1 PCPT METHODOLOGY. PCPT explorations were performed in accordance with American Society for Testing and Materials (ASTM) Designation D3441-86, *Standard ASTM Method for Deep, Quasi-Static, Cone and Friction-Cone Penetration Tests of Soils*. Specifically, a stainless-steel cone tip (equipped with electronic sensors) connected to stainless-steel rods was hydraulically driven into the overburden soils. Measurements of end-bearing resistance, friction resistance, and pore pressure were recorded throughout each sounding to define the lithology and locate the water table.

Analog signals from four sensors in the cone tip were digitized for data logging. Analysis of the digitized data was done in the field using a data acquisition software system. Based on the cone readings a lithologic description of the soils was computed with the aid of the software package.

3.2 SUMMARY OF PCPT EXPLORATIONS. A total of seven PCPT soundings were conducted in the southwestern part of the installation (Figure 1). Depths of the soundings are summarized in Table 1. PCPT sounding lithologic logs are presented in Appendix A.

During the PCPT exploration program, the cone tip met refusal in very dense sands at various depths at all sounding locations. In order to gain lithologic data beyond the dense sands, a drill rig bored through the dense sand collecting split-spoon samples at 5-foot intervals until less dense material was encountered. Once the less dense material was encountered, 2-inch inside diameter (ID) steel casing was placed into the borehole to provide additional support for the piezocone rod and the PCPT sounding continued until refusal. This method was employed successfully at only one location (WHF-CPT-01). At the remaining six locations, the soil was too dense to push the PCPT rod through and the soundings were stopped at the actual depths listed in Table 1.

Figure 1 Phase II-A RI PCPT/BAT Locations

Table 1
Summary of PCPT Soundings

Phase II-A Remedial Investigation Data Release
NAS Whiting Field
Milton, Florida

Date	PCPT Sounding	Proposed Depth (feet bls)	Actual Depth (feet bls)
10-12-92	WHF-2A-CPT-01	180	111
10-12-92	WHF-2A-CPT-02	180	130
10-13-92	WHF-2A-CPT-03	180	96
10-14-92	WHF-2A-CPT-04	180	75
10-14-92	WHF-2A-CPT-05	180	110
10-15-92	WHF-2A-CPT-06	180	99
10-15-92	WHF-2A-CPT-07	180	85

Notes: PCPT = piezocone penetrometer test.
bls = below land surface.

4.0 BAT GROUNDWATER SAMPLING

4.1 BAT METHODOLOGY. The BAT groundwater sampling technique was used to collect groundwater samples for volatile organic compound (VOC) analysis. The following paragraphs describe the methodology used during the NAS Whiting Field Phase II-A Remedial Investigation (RI) field program.

Once the groundwater sampling depth was determined from the PCPT soundings, a drill rig was used to advance a borehole to approximately 2 to 3 feet above the desired sampling location. A sampling device connected to a pushrod was lowered to the bottom of the borehole and was manually driven (150-pound hammer) 2 to 3 feet beyond the bottom of the borehole to prevent drilling mud from being sampled. Once the sampling depth was reached, the pushrod was retracted approximately 6 inches, opening the sampling device to the formation fluids.

A hermetically sealed evacuated vial was then lowered into the pushrod through the use of a weighted sampling assembly. The assembly mechanism contained a double-ended hypodermic needle, which first pierced the sampling device chamber seal, followed immediately thereafter by the vial seal, located in the vial screw cap. Formation fluids were drawn into the vial until the pressure in the vial was equivalent to the formation pore fluid pressure. When the sampling assembly was pulled from the rod tip, the needle was pulled from both seals, and both the vial and tip were resealed.

The BAT procedure was used to obtain groundwater in a closed system, with little opportunity for cross contamination, human contact, volatilization, or changes resulting from exposure to surface pressures of the atmosphere. Although some headspace existed in the vial, this headspace is equivalent to the pore fluid pressure of the natural formation and research has shown that the sample integrity is greater than if sampled by more conventional methods, such as a bailer.

4.2 SUMMARY OF BAT GROUNDWATER SAMPLING PROGRAM. A total of 14 groundwater samples were collected from the 7 exploration locations. One sample was collected from the water table and one sample was collected from the sand and gravel aquifer where the installation water supply wells are screened. Groundwater sample identification and sampling depths are summarized in Table 2.

The groundwater samples were shipped to CH_2M Hill Laboratory, Montgomery, Alabama, for VOC analysis. Samples were collected, analyzed, and reported in accordance with Naval Energy and Environmental Support Activity (NEESA) Level E data quality objectives (DQOs).

5.0 INTERPRETATION OF THE VOLATILE ORGANIC COMPOUND (VOC) ANALYSIS RESULTS

Because the BAT groundwater sampling method is not a U.S. Environmental Protection Agency (USEPA) approved method, the data are appropriate for preliminary screening but would not support risk assessment conclusions or decision making relative to response actions. Although direct comparison of this Level E screening data to Florida and Federal maximum contaminant levels (MCLs) cannot be made (to support risk assessment conclusions), reference to MCLs will be made for comparison purposes.

Table 2
BAT Groundwater Sampling Summary

Phase II-A Remedial Investigation Data Release
NAS Whiting Field
Milton, Florida

Date	Groundwater Sample	Sampling Depth (feet bls)
10-13-92	WHF-2A-WP-01-01	107
10-17-92	WHF-2A-WP-01-02	170
10-13-92	WHF-2A-WP-02-01	113
10-19-92	WHF-2A-WP-02-02	178
10-20-92	WHF-2A-WP-03-01	129
10-20-92	WHF-2A-WP-03-01A	129
10-26-92	WHF-2A-WP-03-02	183
10-27-92	WHF-2A-WP-04-01	128
10-28-92	WHF-2A-WP-04-02	183
10-30-92	WHF-2A-WP-05-01	128
10-30-92	WHF-2A-WP-05-02	198
10-31-92	WHF-2A-WP-06-01	134
10-31-92	WHF-2A-WP-06-02	178
11-1-92	WHF-2A-WP-07-01	133
11-1-92	WHF-2A-WP-07-02	188

Notes: WHF-2A-WP-03-01A is a duplicate sample.
bls = below land surface.

Results of the VOC analysis will be presented in two sets, the water table set and the production set. A summary of the VOCs detected in the 14 groundwater samples is presented in Tables 3 and 4. Table 5 presents the results for the QC samples collected during this event.

5.1 VOC RESULTS IN THE WATER TABLE SAMPLES. A total of six VOC compounds were detected in the water table groundwater samples collected from the seven sampling locations (Table 3). The detected compounds included methylene chloride, acetone, carbon disulfide, 1,2-dichloroethene (DCE), trichloroethene (TCE), benzene, ethylbenzene, xylene, 2-hexanone, toluene, and xylene.

Methylene chloride was detected in six of the seven samples at concentrations ranging from 2 to 11 micrograms per liter ($\mu g/\ell$). Acetone was detected in four samples at concentrations ranging from 7 J to 11 $\mu g/\ell$. Both methylene chloride and acetone were detected at low concentrations (less than 15 $\mu g/\ell$) in the laboratory preparation blanks, trip blanks, and field blanks. Methylene chloride was also detected in the rinsate blanks. Due to the presence of these two VOCs in the laboratory blanks at a concentration of less than five times the blank concentration (the highest concentration) and the other quality control (QC) blanks, it appears that both methylene chloride and acetone are artifacts of laboratory analysis.

Carbon disulfide was detected in six of the seven samples at concentrations ranging from 4 to 49 $\mu g/\ell$. The source of the carbon disulfide, as believed during the Phase I RI, is the BAT sampling system. The septum of the collection vials is composed of butyl rubber, which is required to hold a vacuum against water pressure and perforate easily while sealing completely after sampling is complete. Less pliable inert septa, such as Teflon™, are not acceptable. Carbon disulfide was also detected in the rinsate blanks, trip blanks, and the field blanks.

1,2-DCE was detected at one location (WP-06-01 at 96 $\mu g/\ell$). WP-06 is located 1,100 feet downgradient of Site 3 where 1,2-DCE was detected in the shallow water table BAT samples (118 feet below land surface [bls]) during the Phase I RI. It has not yet been determined that Site 3 is the source of the 1,2-DCE. Similar to the detection of 1,2-DCE, trichloroethene (TCE) was detected at WP-06-01 (80 $\mu g/\ell$) and at the Phase I Site 3 water table locations.

1,2-DCE (1 J $\mu g/\ell$) and TCE (9 J $\mu g/\ell$) were also detected at location WP-02-01. Both concentrations were below the contract required detection limit (CRDL). WP-02-01 is located along the southwest perimeter road approximately 1,000 feet from the South Field Runway 27. WP-02-01 is located downgradient of the South Field Maintenance Hanger (Site 30) where TCE has been detected in both subsurface soil and groundwater samples.

Xylene (2 J $\mu g/\ell$) was detected below the CRDL in the water table sample collected from location WP-01-01 and above the CRDL at WP-06-01 (64 mg/ℓ). WP-01-01 is located downgradient of the South Aviation Gasoline (AVGAS) Tank Sludge Disposal Area (Site 7) where xylene was detected in monitoring well WHF-7-1 at 1,000 $\mu g/\ell$.

Expected VOCs (benzene, toluene, ethyl benzene, and xylenes [BTEX] and solvents), from site related releases within the industrial area, were not detected at sampling locations WP-03-01, WP-04-01, WP-05-01, WP-06-01, and WP-07-01.

5.2 VOC RESULTS FROM THE PRODUCTION ZONE GROUNDWATER SAMPLES. A total of seven VOCs were detected from the seven deeper (production) zone samples of the sand and gravel aquifer (Table 4). The detected compounds included methylene chloride, acetone, carbon disulfide, TCE, benzene, 1,2-dichloroethane (DCA), and bromoethane.

Table 3
Summary of Shallow BAT Groundwater Sample Analytical Results

Phase II-A Remedial Investigation Data Release
NAS Whiting Field
Milton, Florida

Sample Number	Methylene Chloride	Acetone	Carbon Disulfide	1,2-DCE	TCE	Benzene	Ethyl benzene	Xylene	2-Hexanone	Toluene
WP-01-01	9 J	11	--	--	--	--	--	2 J	--	--
WP-02-01	2 J	9 J	4 J	1 J	9 J	--	--	--	--	--
WP-03-01	2 BJ	--	14	--	--	--	--	--	--	--
WP-03-01A	--	--	10	--	--	--	--	--	--	--
WP-04-01	11 B	7 BJ	--	--	--	--	--	--	--	--
WP-05-01	3 BJ	--	49	--	--	--	--	--	--	--
WP-06-01	1 BJ	7 J	24	96	80	340	96	64	2 J	4 J
WP-07-01	--	--	9 J	--	--	--	--	--	--	--

[1] Duplicate sample.

Notes: All results are expressed in micrograms per liter ($\mu g/\ell$).
DCE = dichloroethene.
TCE = trichloroethene.
DCA = dichloroethane.
J = reported concentration is an estimated value.
B = contamination found in the method blank sample.
-- = not detected.

Table 4
Summary of Deep BAT Groundwater Sample Analytical Results

Phase II-A Remedial Investigation Data Release
NAS Whiting Field
Milton, Florida

Sample Number	Methylene Chloride	Acetone	Carbon Disulfide	TCE	Benzene	1,2-DCA	Bromoethane
WP-01-02	--	390	--	--	160	--	--
WP-02-02	4 J	--	2 J	--	--	--	--
WP-03-02	2 BJ	--	--	4 J	--	3 J	--
WP-04-02	5 BJ	--	2 J	--	--	--	1 J
WP-05-02	5 BJ	--	18	--	--	--	--
WP-06-02	4 BJ	--	20	--	--	--	--
WP-07-02	1 BJ	--	17	2 J	--	--	--

Notes: All results are expressed in micrograms per liter ($\mu g/\ell$).
TCE = trichloroethene.
DCA = dichloroethane.
-- not detected.
J = reported concentration is an estimated value.
B = contamination found in the method blank sample.

Table 5
Summary of QC BAT Groundwater Sample Analytical Results

Phase II-A Remedial Investigation Data Release
NAS Whiting Field
Milton, Florida

Sample Number	Methylene Chloride	Acetone	Carbon Disulfide
WP-RB-01	3 J	--	--
WP-RB-02	--	--	--
WP-RB-03	2 BJ	--	1 J
WP-RB-04	1 BJ	--	8 J
WP-TB-01	2 J	17	--
WP-TB-02	2 J	9 J	--
WP-TB-03	4 J	18	--
WP-TB-04	--	--	--
WP-TB-05	2 BJ	15	--
WP-TB-06	5 BJ	--	--
WP-TB-07	6 BJ	--	1 J
WP-TB-08	6 BJ	--	--
WP-TB-09	6 BJ	--	1 J
WP-TB-10	7 BJ	9 J	1 J
WP-FB-01	1 J	--	--
WP-FB-02	1 BJ	--	31

Notes: All results are expressed in micrograms per liter ($\mu g/\ell$).
J = reported concentration is an estimated value.
-- = not detected.
B = contamination found in the method blank sample.

As mentioned in Section 5.1, methylene chloride and acetone appear to be artifacts of laboratory analysis because of their presence in the associated QC blanks. The detection of carbon disulfide can be attributed to the butyl rubber septa in the collection vials (see Section 5.1).

TCE (WP-03-02, 4 $\mu g/\ell$), 1,2-DCA (WP-03-02, 3 $\mu g/\ell$), and bromoethane (WP-04-02, 1 $\mu g/\ell$) were all detected below the CRDLs. Bromomethane was reported below the CRDL at 1 $\mu g/\ell$ in the BAT sample from WP-04-02.

Benzene was detected at WP-01-02 at 160 $\mu g/\ell$. The location of WP-01-02 is downgradient of Site 7 where benzene was detected in monitoring well WHF-7-1 at 8,800 $\mu g/\ell$ during the Verification Study. The lack of any benzene in the water table sample WP-01-01 may be an indication that the contaminated groundwater at Site 7 is being driven deeper into the aquifer under dipping clay layers or by infiltrating groundwater; therefore, not being detected in the water table component of the aquifer. The detection of benzene deeper in the aquifer and not at the water table was also encountered (further downgradient, west of Site 16) during the Phase I BAT sampling program. These data suggest that the source of the VOC contamination is the southern industrial area. Confirmation monitoring wells will be installed upgradient and downgradient of Site 16 during the Phase II-A RI.

6.0 SUMMARY

The results of the PCPT and BAT explorations provided both lithologic and groundwater quality information at locations between the industrial area and Clear Creek Sites 15 and 16.

BaSed on the results of the groundwater sampling and VOC analysis, there does not appear to be a westward component of VOC contaminant migration from the industrial area to Clear Creek. However, there does appear to be southwesterly component of VOC (i.e., benzene, 160 $\mu g\ell$ at WHF-2A-CPT-01) migration from the industrial area towards Sites 15 and 16 and Clear Creek. This detection of benzene at WHF-2A-CPT-01 in the deeper zone suggests that the benzene found deeper in the aquifer, west of Site 16, may be a result of its migration from upgradient sources in the industrial area.

Monitoring wells will be installed and sampled upgradient of Sites 15 and 16 to determine if the industrial source area contamination is migrating towards the sites and Clear Creek.

APPENDIX A

PCPT SOUNDING LOGS

TITLE: NAVAL AIR STATION WHITING FIELD		**LOG of WELL:** N/A	**BORING NO.** WHF-2A-CPT-01
CLIENT: SOUTHNAVFACENGCOM			**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Williams Earth Science Inc. (WESI)		**DATE STARTED:** 10/12/92	**COMPLTD:** 10/17/92
METHOD: Cone Penotrometer	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 170FT.	**DPTH TO ∇** 105 FT.
LOGGED BY: WESI	**WELL DEVELOPMENT DATE:** N/A		**SITE:** WHITING FIELD

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Sand to silty sand.		SM/SP		
					Sand		SP		
5					Sand to silty sand.		SM/SP		
10							SP		
15									
20									
25					Sand				
30									
35									
40					Sand to silty sand.		SM/SP		
							SP		
45									
50					Sand				
55					Gravelly sand to sand.		SW/SP		
					Sand		SP		
							SW/SP		
60					Gravelly sand to sand.				

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD		**LOG of WELL:** N/A	**BORING NO.** WHF-2A-CPT-01
CLIENT: SOUTHNAVFACENGCOM			**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Williams Earth Science Inc. (WESI)		**DATE STARTED:** 10/12/92	**COMPLTD:** 10/17/92
METHOD: Cone Penotrometer	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 170FT.	**DPTH TO ∇** 105 FT.
LOGGED BY: WESI	**WELL DEVELOPMENT DATE:** N/A		**SITE:** WHITING FIELD

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Continued from PAGE 1				
					Gravelly sand to sand.		SW/SP		
					Sand		SP		
65							SW/SP		
70					Gravelly sand to sand.				
75									
					Sand		SP		
					Gravelly sand to sand.		SW/SP		
80					Sand		SP		
					Gravelly sand to sand.		SW/SP		
							SP		
85					Sand		SW/SP		
					Gravelly sand to sand.		SP		
					Sand		SM/SP		
90					Sand to silty sand.		SP		
					Sand				
95									
			0.2/1.5	0	SAND: Grey, fine, trace gravel.		SP	37,50/5",--	
100			0.5/1.5	0	SAND: Grey, fine to medium, little coarse sand and gravel.		SP	33,41,42	
			0.0/1.5		N/A			31,32,30	∇
105	105'								
110									
115			0.8/1.5	0	SAND: Grey, fine to medium, little coarse, dark red clayey fine sand lenses.		SP	17,24,32	
120							SW		

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD		**LOG of WELL:** N/A	**BORING NO.** WHF-2A-CPT-01
CLIENT: SOUTHNAVFACENGCOM			**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Williams Earth Science Inc. (WESI)		**DATE STARTED:** 10/12/92	**COMPLTD:** 10/17/92
METHOD: Cone Penotrometer	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 170FT.	**DPTH TO ∇** 105 FT.
LOGGED BY: WESI	**WELL DEVELOPMENT DATE:** N/A		**SITE:** WHITING FIELD

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Continued from PAGE 2				
			0.8/1.5	0	SAND: Grey, coarse to fine, little gravel, grading to fine sand at 0.2.		SW	32,34,28	
125			0.1/1.5	0	SAND: Light grey, fine to medium.		SP	39,50/6",--	
130			0.3/1.5	0	Same as above, trace coarse.		SP	49,50/6",--	
135									
140									
145									
150									
155									
160									
165									
170	170'								
175									
180									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD	**LOG of WELL:** N/A	**BORING NO.** WHF-2A-CPT-02
CLIENT: SOUTHNAVFACENGCOM		**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Williams Earth Science Inc. (WESI)	**DATE STARTED:** 10/12/92	**COMPLTD:** 10/19/92
METHOD: Cone Penotrometer	**CASE SIZE:** N/A / **SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA / **TOT DPTH:** 178FT.	**DPTH TO ∇** 112 FT.
LOGGED BY: WESI	**WELL DEVELOPMENT DATE:** N/A	**SITE:** WHITING FIELD

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Silty sand to sandy silt.		SM/ML		
5					Sand to silty sand.		SP/SM		
					Silty sand to sandy silt.		SM/ML		
10					Sandy silt to clayey silt.		ML		
					Sand to silty sand.		SP/SM		
					Sand		SP		
15					Clayey silt to silty clay.		ML/CL		
					Silty sand to sandy silt.		SM/ML		
					Gravelly sand to sand.		SW/SP		
20					Sand		SP		
					Gravelly sand to sand.		SW/SP		
25									
30					Sand		SP		
35									
40					Sand to silty sand.		SP/SM		
					Sand		SP		
45									
50					Gravelly sand to sand.		SW/SP		
55					Sand		SP		
60									

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD	**LOG of WELL:** N/A	**BORING NO.** WHF-2A-CPT-02
CLIENT: SOUTHNAVFACENGCOM		**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Williams Earth Science Inc. (WESI)	**DATE STARTED:** 10/12/92	**COMPLTD:** 10/19/92
METHOD: Cone Penotrometer	**CASE SIZE:** N/A / **SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA / **TOT DPTH:** 178FT.	**DPTH TO ∇** 112 FT.
LOGGED BY: WESI	**WELL DEVELOPMENT DATE:** N/A	**SITE:** WHITING FIELD

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Continued from PAGE 1				
					Sand		SP		
65					Sand to silty sand.		SP/SM		
					Sand		SP		
					Sand to silty sand.		SP/SM		
70					Sand		SP		
					Gravelly sand to sand.		SW/SP		
					Sand		SP		
75					Gravelly sand to sand.		SW/SP		
					Sand		SP		
80					Gravelly sand to sand.		SW/SP		
85									
90									
					Sand		SP		
95					Gravelly sand to sand.		SW/SP		
100									
					Sand		SP		
105					Gravelly sand to sand.		SW/SP		
					Sand to silty sand.		SP/SM		
					Gravelly sand to sand.		SW/SP		
110					Sand		SP		
	113 '				Gravelly sand to sand.		SW/SP		∇
115									
120									

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD		**LOG of WELL:** N/A	**BORING NO.** WHF-2A-CPT-02
CLIENT: SOUTHNAVFACENGCOM			**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Williams Earth Science Inc. (WESI)		**DATE STARTED:** 10/12/92	**COMPLTD:** 10/19/92
METHOD: Cone Penotrometer	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 178FT.	**DPTH TO ∇** 112 FT.
LOGGED BY: WESI	**WELL DEVELOPMENT DATE:** N/A		**SITE:** WHITING FIELD

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Continued from PAGE 2				
125					Gravelly sand to sand.		SW/SP		
130									
135									
140			6/18		SAND: Purple, white and tan, fine to very fine, some clay at 140 ft. bls.		SP	27,35,42	
145									
150			6/18		SAND: Light brown, very fine to medium, some clay and silt.		SP	47,50/4"	
155									
160									
165									
170									
175	175'								
180									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD	**LOG of WELL:** N/A	**BORING NO.** WHF-2A-CPT-03
CLIENT: SOUTHNAVFACENGCOM		**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Williams Earth Science Inc. (WESI)	**DATE STARTED:** 10/13/92	**COMPLTD:** 10/26/92
METHOD: Cone Penotrometer	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 183FT.	**DPTH TO ∇** 111 FT.
LOGGED BY: WESI	**WELL DEVELOPMENT DATE:** N/A	**SITE:** WHITING FIELD

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Sandy silt to clayey silt.		ML		
					Silty sand to sandy silt.		SM/ML		
5					Sand to silty sand.		SP/SM		
					Silty sand to sandy silt.		SM/ML		
10					Sand to silty sand.		SP/SM		
15									
					Sand		SP		
20									
					Gravelly sand to sand.		SW/SP		
25					Sand		SP		
					Gravelly sand to sand.		SW/SP		
30					Sand		SP		
					Gravelly sand to sand.		SW/SP		
35					Sand		SP		
					Gravelly sand to sand.		SW/SP		
40									
					Sand		SP		
45									
50									
55									
60									
65							SP/SM		

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD	**LOG of WELL:** N/A	**BORING NO.** WHF-2A-CPT-03
CLIENT: SOUTHNAVFACENGCOM		**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Williams Earth Science Inc. (WESI)	**DATE STARTED:** 10/13/92	**COMPLTD:** 10/26/92

METHOD: Cone Penotrometer	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 183FT.	**DPTH TO ∇** 111 FT.
LOGGED BY: WESI	**WELL DEVELOPMENT DATE:** N/A		**SITE:** WHITING FIELD

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Continued from PAGE 1				
					Sand to silty sand.		SP/SM		
					Silty sand to sandy silt.		SM/ML		
					Sand to silty sand.		SP/SM		
70					Sand		SP		
75									
80									
85									
90					Gravelly sand to sand.		SW/SP		
95									
100									
105									
110			6/18		SAND: Tan, medium coarse to fine, trace silt, red-orange grains throughout.		SP	28,44,39	∇
115									
120									
125									
130	129'								

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD	**LOG of WELL:** N/A	**BORING NO.** WHF-2A-CPT-03
CLIENT: SOUTHNAVFACENGCOM		**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Williams Earth Science Inc. (WESI)	**DATE STARTED:** 10/13/92	**COMPLTD:** 10/26/92
METHOD: Cone Penotrometer	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 183FT.	**DPTH TO ∇** 111 FT.
LOGGED BY: WESI	**WELL DEVELOPMENT DATE:** N/A	**SITE:** WHITING FIELD

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Continued from PAGE 2				
135			6/18		SAND: Light brown to white, fine to very fine, saturated.		SP	33,48,41	
140			5/18		SAND: Light brown to white, fine to very fine, saturated.		SP	43,50,54	
145									
150									
155									
160									
165									
170									
175									
180	180'								
185									
190									
195									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD		**LOG of WELL:** N/A	**BORING NO.** WHF-2A-CPT-04
CLIENT: SOUTHNAVFACENGCOM			**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Williams Earth Science Inc. (WESI)		**DATE STARTED:** 10/14/92	**COMPLTD:** 10/28/92
METHOD: Cone Penotrometer	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 180FT.	**DPTH TO ∇** 125 FT.
LOGGED BY: WESI	**WELL DEVELOPMENT DATE:** N/A		**SITE:** WHITING FIELD

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Sand to silty sand.		SP/SM		
							SP		
					Sand		SP/SM		
5					Sand to silty sand.				
					Undefined		SM/ML		
					Silty sand to sandy silt.				
10					Sand		SP		
15									
20					Sand to silty sand.		SP/SM		
25									
30					Sand		SP		
35									
40									
45					Sand to silty sand.		SP/SM		
					Sand		SP		
							SP/SM		
50					Sand to silty sand.		SP		
					Sand				
55					Sand to silty sand.		SP/SM		
					Sand		SP		
60									
65									

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD	**LOG of WELL:** N/A	**BORING NO.** WHF-2A-CPT-04
CLIENT: SOUTHNAVFACENGCOM		**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Williams Earth Science Inc. (WESI)	**DATE STARTED:** 10/14/92	**COMPLTD:** 10/28/92
METHOD: Cone Penotrometer	**CASE SIZE:** N/A / **SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA / **TOT DPTH:** 180FT.	**DPTH TO ∇** 125 FT.
LOGGED BY: WESI	**WELL DEVELOPMENT DATE:** N/A	**SITE:** WHITING FIELD

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Continued from PAGE 1				
					Sand		SP		
					Gravelly sand to sand.		SW/SP		
70					Sand		SP		
					Gravelly sand to sand.		SW/SP		
					Sand		SP		
75					Gravelly sand to sand.		SW/SP		
					Sand		SP		
80					Gravelly sand to sand.		SW/SP		
85									
					Sand		SP		
90					Gravelly sand to sand.		SW/SP		
95									
100									
105									
110			14/18		SILTY SAND: Yellow to orange red, saturated.		SM	40,40,27	
115									
120									
125									∇
130	128'							50/6",-,-	

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD	**LOG of WELL:** N/A	**BORING NO.** WHF-2A-CPT-04
CLIENT: SOUTHNAVFACENGCOM		**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Williams Earth Science Inc. (WESI)	**DATE STARTED:** 10/14/92	**COMPLTD:** 10/28/92

METHOD: Cone Penotrometer	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 180FT.	**DPTH TO ∇** 125 FT.
LOGGED BY: WESI	**WELL DEVELOPMENT DATE:** N/A		**SITE:** WHITING FIELD

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Continued from PAGE 2				
			0/18						
135									
140			6/18		SAND: Tan, very fine to medium, trace medium white quartz, wet.		SP	26,26,50/5"	
145									
150									
155									
160									
165									
170									
175									
180	180'								
185									
190									
195									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD	**LOG of WELL:** N/A	**BORING NO.** WHF-2A-CPT-05
CLIENT: SOUTHNAVFACENGCOM		**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Williams Earth Science Inc. (WESI)	**DATE STARTED:** 10/14/92	**COMPLTD:** 10/30/92
METHOD: Cone Penotrometer	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 195FT.	**DPTH TO ∇** 125 FT.
LOGGED BY: WESI	**WELL DEVELOPMENT DATE:** N/A	**SITE:** WHITING FIELD

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Silty sand to sandy silt.		SM/ML		
					Sandy silt to clayey silt.		SM		
					Silty sand to sandy silt.		SM/ML		
5					Sand to silty sand.		SP/SM		
10									
					Silty sand to sandy silt.		SM/ML		
15					Sandy silt to clayey silt.		ML		
					Sand to silty sand.		SP/SM		
20					Clay		CL		
					Silty clay to clay.		CL		
25					Sand		SP		
30									
35									
40									
45									
					Gravelly sand to sand.		SW/SP		
50					Sand		SP		
55									
60									
65									

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD	**LOG of WELL:** N/A	**BORING NO.** WHF-2A-CPT-05
CLIENT: SOUTHNAVFACENGCOM		**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Williams Earth Science Inc. (WESI)	**DATE STARTED:** 10/14/92	**COMPLTD:** 10/30/92
METHOD: Cone Penotrometer	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 195FT.	**DPTH TO ∇** 125 FT.
LOGGED BY: WESI	**WELL DEVELOPMENT DATE:** N/A	**SITE:** WHITING FIELD

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Continued from PAGE 1				
70					Sand		SP		
75									
80									
85									
90					Gravelly sand to sand.		SW/SP		
95									
100									
105									
110									
115									
120			3/18		SAND: Light brown, fine to very fine, trace silt.		SP	50/3",-,-	
125									∇
130	128'								

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD	**LOG of WELL:** N/A	**BORING NO.** WHF-2A-CPT-05
CLIENT: SOUTHNAVFACENGCOM		**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Williams Earth Science Inc. (WESI)	**DATE STARTED:** 10/14/92	**COMPLTD:** 10/30/92
METHOD: Cone Penotrometer	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 195FT.	**DPTH TO ∇** 125 FT.
LOGGED BY: WESI	**WELL DEVELOPMENT DATE:** N/A	**SITE:** WHITING FIELD

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Continued from PAGE 2				
135									
140									
145									
150									
155									
160									
165									
170									
175									
180									
185	185'								
190									
195									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD	**LOG of WELL:** N/A	**BORING NO.** WHF-2A-CPT-06
CLIENT: SOUTHNAVFACENGCOM		**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Williams Earth Science Inc. (WESI)	**DATE STARTED:** 10/15/92	**COMPLTD:** 10/31/92
METHOD: Cone Penotrometer	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 175FT.	**DPTH TO ∇** 130 FT.
LOGGED BY: WESI	**WELL DEVELOPMENT DATE:** N/A	**SITE:** WHITING FIELD

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Silty sand to sandy silt.		SM/ML		
					Sand to silty sand.		SP/SM		
5					Undefined				
					Sandy silt to clayey silt.		ML		
					Silty sand to sandy silt.		SM/ML		
10					Sand to silty sand.		SP/SM		
15					Undefined				
					Silty sand to sandy silt.		SM/ML		
					Sand to silty sand.		SP/SM		
20					Sand		SP		
					Clay		CL		
					Gravelly sand to sand.		SW/SP		
25					Sand		SP		
					Gravelly sand to sand.		SW/SP		
30					Sandy silt to clayey silt.		ML		
					Silty clay to clay.		CL		
					Clayey silt to silty clay.		ML/CL		
35					Silty clay to clay.		CL		
					Silty sand to sandy silty.		SM/ML		
					Sandy silt to clayey silt.		ML		
40					Clayey silt to silty clay.		ML/CL		
					Sand		SP		
45					Gravelly sand to sand.		SW/SP		
50					Sand		SP		
55					Gravelly sand to sand.		SW/SP		
					Sand		SP		
60									

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD	**LOG of WELL:** N/A	**BORING NO.** WHF-2A-CPT-06
CLIENT: SOUTHNAVFACENGCOM		**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Williams Earth Science Inc. (WESI)	**DATE STARTED:** 10/15/92	**COMPLTD:** 10/31/92
METHOD: Cone Penotrometer	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 175FT.	**DPTH TO ∇** 130 FT.
LOGGED BY: WESI	**WELL DEVELOPMENT DATE:** N/A	**SITE:** WHITING FIELD

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Continued from PAGE 1				
					Sand		SP		
65					Gravelly sand to sand.		SW/SP		
					Sand		SP		
					Gravelly sand to sand.		SW/SP		
70									
75									
80									
					Sand		SP		
					Sand to silty sand.		SP/SM		
							SP		
85					Sand.		SW/SP		
					Gravelly sand to sand.				
90									
					Sand		SP		
					Gravelly sand to sand.		SW/SP		
95									
100									
105									
110									
115									
120									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD	**LOG of WELL:** N/A	**BORING NO.** WHF-2A-CPT-06
CLIENT: SOUTHNAVFACENGCOM		**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Williams Earth Science Inc. (WESI)	**DATE STARTED:** 10/15/92	**COMPLTD:** 10/31/92
METHOD: Cone Penotrometer	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 175FT.	**DPTH TO ∇** 130 FT.
LOGGED BY: WESI	**WELL DEVELOPMENT DATE:** N/A	**SITE:** WHITING FIELD

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Continued from PAGE 2				
125			18/18		CLAY: Grey with red-orange mottling, dry, trace very fine sand.		CL	16,25,33-	
130			3/18		SILTY SAND: Grey, very fine to fine, wet to saturated.		SM	42,50/5",-	∇
	133'								
135									
140									
145									
150									
155									
160									
165									
170									
175	175'								
180									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD	**LOG of WELL:** N/A	**BORING NO.** WHF-2A-CPT-07
CLIENT: SOUTHNAVFACENGCOM		**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Williams Earth Science Inc. (WESI)	**DATE STARTED:** 10/16/92	**COMPLTD:** 11/01/92

METHOD: Cone Penotrometer	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 185FT.	**DPTH TO ∇** 130 FT.
LOGGED BY: WESI	**WELL DEVELOPMENT DATE:** N/A		**SITE:** WHITING FIELD

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Sand to silty sand.		SP/SM		
							SP		
					Sand		SP/SM		
5					Sand to silty sand.				
					Silty sand to sandy silt.		SM/ML		
							SP		
					Sand		SP/SM		
10					Sand to silty sand.		CL		
					Silty clay to clay.		SP		
15					Clay		ML/CL		
							CL		
					Very stiff, fine grained sand.				
					Undefined.		ML/CL		
							SP/SM		
20					Clayey silt to silty clay.		SP		
					Clay				
25					Undefined				
					Clayey silt to silty clay.				
					Sand to silty sand.				
30					Sand		SW/SP		
							SP		
					Gravelly sand to sand.		SW/SP		
					Sand				
35					Gravelly sand to sand.		SP/SM		
							ML		
					Sand to silty sand.		SP		
40					Sandy silt to clayey silt.		SW/SP		
					Sand		SP		
					Gravelly sand to sand.		SW/SP		
45					Sand				
					Gravelly sand to sand.				
50					Sand		SP		
					Gravelly sand to sand.		SW/SP		
55					Silty sand to sandy silt.		SM/ML		
					Sany silt to clayey silt.		ML		
					Clayey silt to silty clay.		ML/CL		
60					Sand to silty sand.		SP/SM		
					Sand		SP		
65									

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD	**LOG of WELL:** N/A	**BORING NO.** WHF-2A-CPT-07
CLIENT: SOUTHNAVFACENGCOM		**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Williams Earth Science Inc. (WESI)	**DATE STARTED:** 10/16/92	**COMPLTD:** 11/01/92
METHOD: Cone Penotrometer	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 185FT.	**DPTH TO ∇** 130 FT.
LOGGED BY: WESI	**WELL DEVELOPMENT DATE:** N/A	**SITE:** WHITING FIELD

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Continued from PAGE 1				
					Sand		SP		
70					Sand to silty sand.		SP/SM		
					Sand		SP		
					Gravelly sand to sand.		SW/SP		
75					Sand		SP		
					Gravelly sand to sand.		SW/SP		
80					Sand to silty sand.		SP/SM		
					Gravelly sand to sand.		SW/SP		
85					Undefined				
90									
95									
100									
105									
110									
115									
120									
125									
130	130'								∇

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD	**LOG of WELL:** N/A	**BORING NO.** WHF-2A-CPT-07
CLIENT: SOUTHNAVFACENGCOM		**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Williams Earth Science Inc. (WESI)	**DATE STARTED:** 10/16/92	**COMPLTD:** 11/01/92
METHOD: Cone Penotrometer	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 185FT.	**DPTH TO ∇** 130 FT.
LOGGED BY: WESI	**WELL DEVELOPMENT DATE:** N/A	**SITE:** WHITING FIELD

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Continued from PAGE 2				
135									
140									
145									
150									
155									
160									
165									
170									
175									
180									
185	185'								
190									
195									

 ABB ENVIRONMENTAL SERVICES, INC.