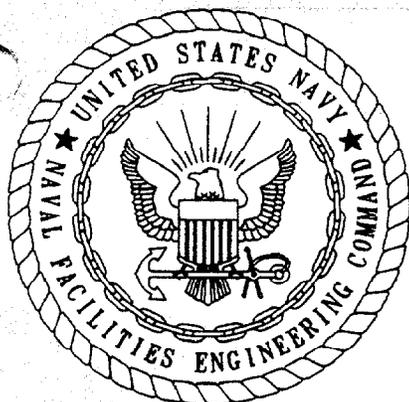


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BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT FOR
STUDY AREA 48 NTC ORLANDO FL
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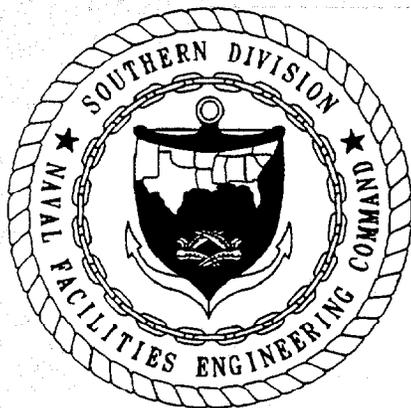
**BASE REALIGNMENT AND CLOSURE
ENVIRONMENTAL SITE SCREENING REPORT**

STUDY AREA 48

**NAVAL TRAINING CENTER
ORLANDO FLORIDA**

**UNIT IDENTIFICATION CODE: N65928
CONTRACT NO. N62467-89-D-0317/107**

MAY 1997



**SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORTH CHARLESTON, SOUTH CAROLINA
29419-9010**

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**BASE REALIGNMENT AND CLOSURE
ENVIRONMENTAL SITE SCREENING REPORT**

STUDY AREA 48

**NAVAL TRAINING CENTER
ORLANDO FLORIDA**

Unit Identification Code: N65928

Contract No.: N62467-89-D-0317/107

Prepared by:

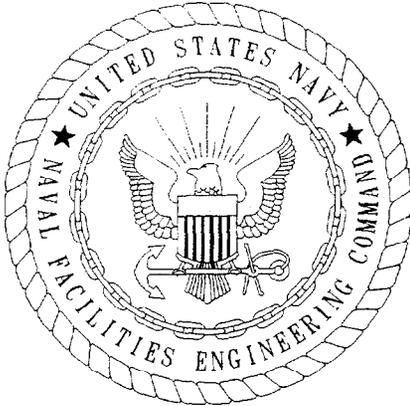
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2590 Executive Center Circle, East
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Prepared for:

**Department of the Navy, Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29418**

Barbara Nwokike, Code 1873, Engineer-in-Charge

May 1997



CERTIFICATION OF TECHNICAL
DATA CONFORMITY (MAY 1987)

The Contractor, ABB Environmental Services, Inc., hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-89-D-0317/107 are complete and accurate and comply with all requirements of this contract.

DATE: May 28, 1997

NAME AND TITLE OF CERTIFYING OFFICIAL: John Kaiser
Task Order Manager

NAME AND TITLE OF CERTIFYING OFFICIAL: Richard Allen
Project Technical Lead

(DFAR 252.227-7036)

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Study Area 48
Naval Training Center
Orlando, Florida

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Study Area 48
Naval Training Center
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GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
bls	below land surface
CLP	Contract Laboratory program
DDE	dichlorodiphenyldichloroethene
DQO	data quality objective
FDEP	Florida Department of Environmental Protection
FID	flame ionization detector
MCL	maximum contaminant level
mg/kg	milligrams per kilogram
$\mu\text{g}/\ell$	micrograms per liter
QC	quality control
RBC	risk-based concentration
SA	study area
SCG	soil cleanup goals
TAL	target analyte list
TCL	target compound list
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank

1.0 STUDY AREA 48, FORMER HOBBY COMPLEX, MCCOY ANNEX

In September 1996, ABB Environmental Services, Inc. (ABB-ES) submitted the results of initial site screening activities (ABB-ES, 1996a) at Study Area (SA) 48. In that report, ABB-ES recommended further evaluation of a geophysical anomaly. In October 1996, the Orlando Partnering Team (OPT) concluded that the site would also require an evaluation of secondary standards exceedances (aluminum and iron) in groundwater. They also directed ABB-ES to resample one monitoring well for a pesticide detection (4,4'-dichlorodiphenyldichloroethene [DDE]). This report contains information gathered as a result of initial, as well as supplemental, site screening activities.

1.1 STUDY AREA 48, BACKGROUND AND CONDITIONS. SA 48 is located in the northeastern part of McCoy Annex of Naval Training Center (NTC), Orlando (Figure 1). The Technical Memorandum, U.S. Air Force Sites Records Search (ABB-ES, 1995a) identified this location as Area of Concern MC-9 due to former use as a hobby shop complex. Currently, the area consists of asphalt pads, with virtually no structures on them, surrounded by grass. One of the asphalt pads has a vehicle wash rack on it (Figure 2). Railroad sidings are embedded in pavement in this area as well. Site screening activities were initiated to evaluate potential contamination of soil or groundwater associated with former site use activities including auto and boat repair, carpentry, and painting. The potential for the presence of underground storage tanks (USTs) was also evaluated. Proposed field activities were presented in the Site Screening Plan, Air Force Sites, Addendum 2 (ABB-ES, 1995b).

1.2 STUDY AREA 48, INVESTIGATION SUMMARY. The site screening investigation conducted at SA 48 is described below.

1.2.1 Geophysical Survey A walkover survey of the SA was completed using a metal detector (Fisher Model TW-6). The target area for the geophysical survey is shown on Figure 2. The focus of the geophysical survey was to identify anomalies that would indicate remaining USTs or piping associated with the former buildings at this site. Because the building footprints currently visible at the site were not believed to be the original footprints, a larger area was included in the survey. Geophysical data identified eight anomalous zones within the boundaries of the SA. One of these anomalies (in an asphalt-patched area) may indicate the presence of a UST based on instrument response. Because of the potential for a UST, a ground penetrating radar survey was completed to further evaluate the anomaly.

1.2.2 Soil Boring Investigation Three soil borings were advanced at SA 48 using a hand auger. The inferred groundwater flow direction was to the northeast. The borings were located in the vicinity of, or hydraulically downgradient from (i.e., east-northeast), identified geophysical anomalies or other site features of interest (e.g., wash rack). Soil samples were collected continuously and field-screened with a flame ionization detector (FID). No elevated FID responses were detected. One soil sample was collected from each boring from the deepest sample interval above the water table (which occurred at approximately 4 feet below land surface [bls] across the SA). Three soil samples (one from each boring) were submitted for full suite Contract Laboratory program (CLP) target

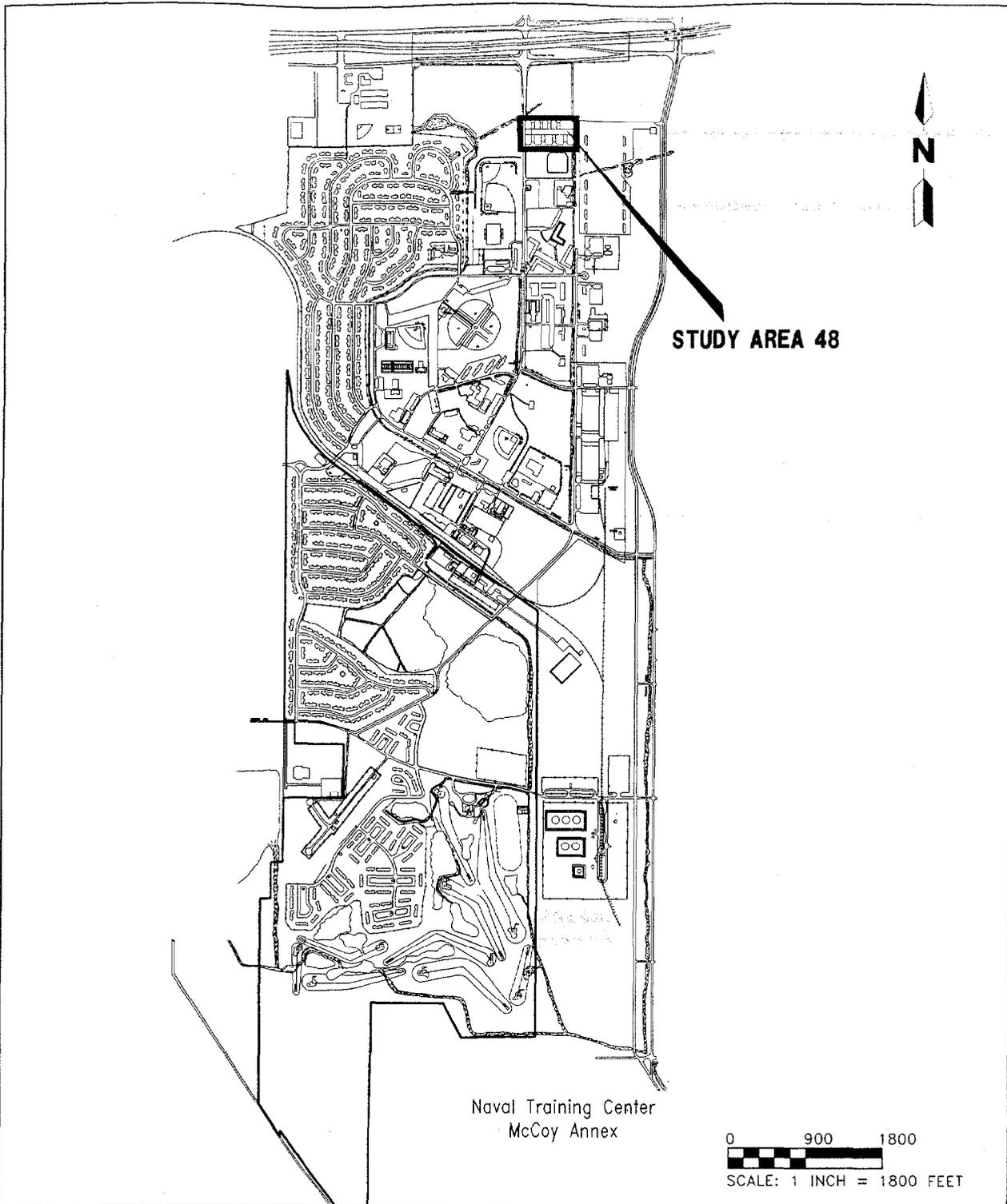


FIGURE 1
STUDY AREA LOCATION



**BASE REALIGNMENT AND CLOSURE
ENVIRONMENTAL SITE SCREENING
REPORT, STUDY AREA 48**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

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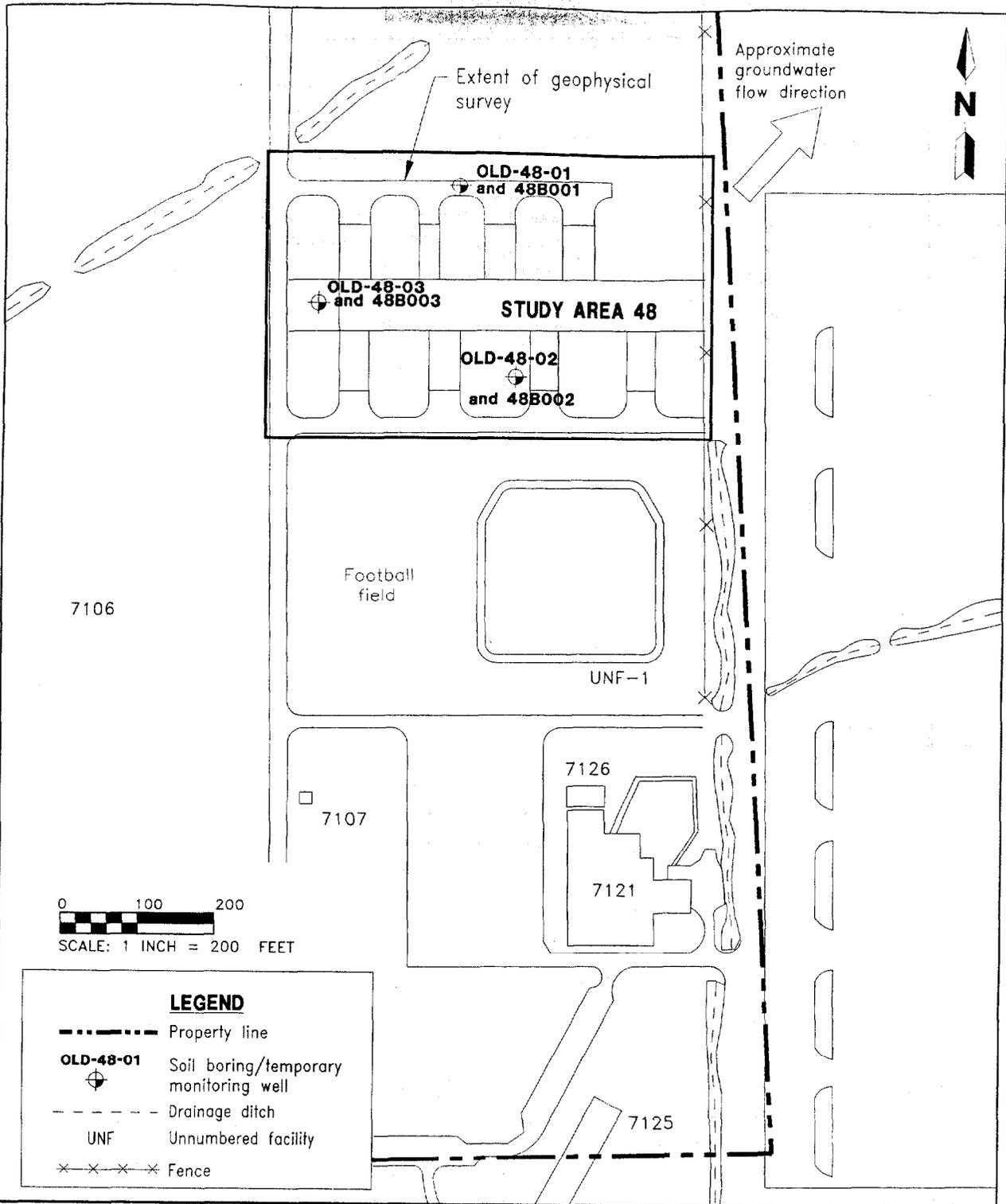


FIGURE 2
SAMPLE LOCATIONS, FORMER
HOBBY COMPLEX, McCOY ANNEX



BASE REALIGNMENT AND CLOSURE
ENVIRONMENTAL SITE SCREENING
REPORT, STUDY AREA 48

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

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compound list (TCL) and target analyte list (TAL) analyses, in support of U.S. Environmental Protection Agency (USEPA) Level IV data quality objectives (DQOs). Appropriate quality control (QC) samples were collected to support this effort.

1.2.3 Groundwater Monitoring Well Installation and Sampling Each boring was completed as a temporary monitoring well. Soil borings 48B001 through 48B003 correspond to monitoring wells OLD-48-01 through OLD-48-03, respectively (Figure 2). Slotted 2-inch-diameter polyvinyl chloride well screen was lowered into each boring. The wells were then purged and sampled using the low-flow technique. Static water-level readings were taken in each well, and an approximate groundwater flow direction to the northeast was determined. The well screens were withdrawn and the boreholes were backfilled with native soil following sample collection. One groundwater sample from each monitoring well was submitted for full suite CLP TCL and TAL laboratory analyses plus total suspended solids in support of USEPA Level IV DQOs. Appropriate QC samples were collected to support this effort.

1.3 STUDY AREA 48, RESULTS. The results of site screening investigation activities at SA 48 are discussed below. Results of geophysical surveys are included as Appendix A. A summary of positive detections in soil and groundwater analytical results is presented in Appendix B. A complete set of soil and groundwater analytical results is presented in Appendix C. Appendix D contains the soil boring logs, temporary monitoring well installation diagrams, and groundwater sample field data.

The soil analytical results were evaluated by comparing their respective concentrations to (1) basewide soil background concentrations (for inorganic analytes, only); (2) Florida Department of Environmental Protection's (FDEP's) Soil Cleanup Goals (SCGs) for residential soil or (if applicable) the leachability-based SCGs; and (3) USEPA Region III risk-based concentrations (RBCs). Groundwater analytical results were compared to (1) basewide groundwater background concentrations (for inorganic analytes, only); (2) FDEP's groundwater guidance concentrations; (3) USEPA Maximum Contaminant Levels (MCLs); and (4) USEPA Region III RBCs. Following are the significant findings from this evaluation. Analytical results exceeding screening criteria are summarized on Figure 3.

1.3.1 Geophysical Surveys A metal detector survey identified eight anomalies within the boundaries of the SA. One of these anomalies is located in an asphalt-patched area and was interpreted to be a potential UST. Accordingly, a ground penetrating radar survey was completed to further evaluate the anomaly. The radar survey was completed along 14 traverses in the vicinity of the eight metal detector anomalies mapped during initial site screening activities. There were no indications of possible USTs in the recorded data along any of the traverses, although there appeared to be a shallow (less than 2 feet bls) buried east-west utility 6 to 8 feet south of the railroad tracks along the alignment of five of the metal detector anomaly locations.

1.3.2 Subsurface Soil None of the compounds detected in any of the three samples exceeded their respective screening criteria. The results of all laboratory analyses are included in Appendices B and C as Table B-1, Summary of Positive Detections in Subsurface Soil Analytical Results, and Table C-1, Summary of Subsurface Soil Analytical Results.

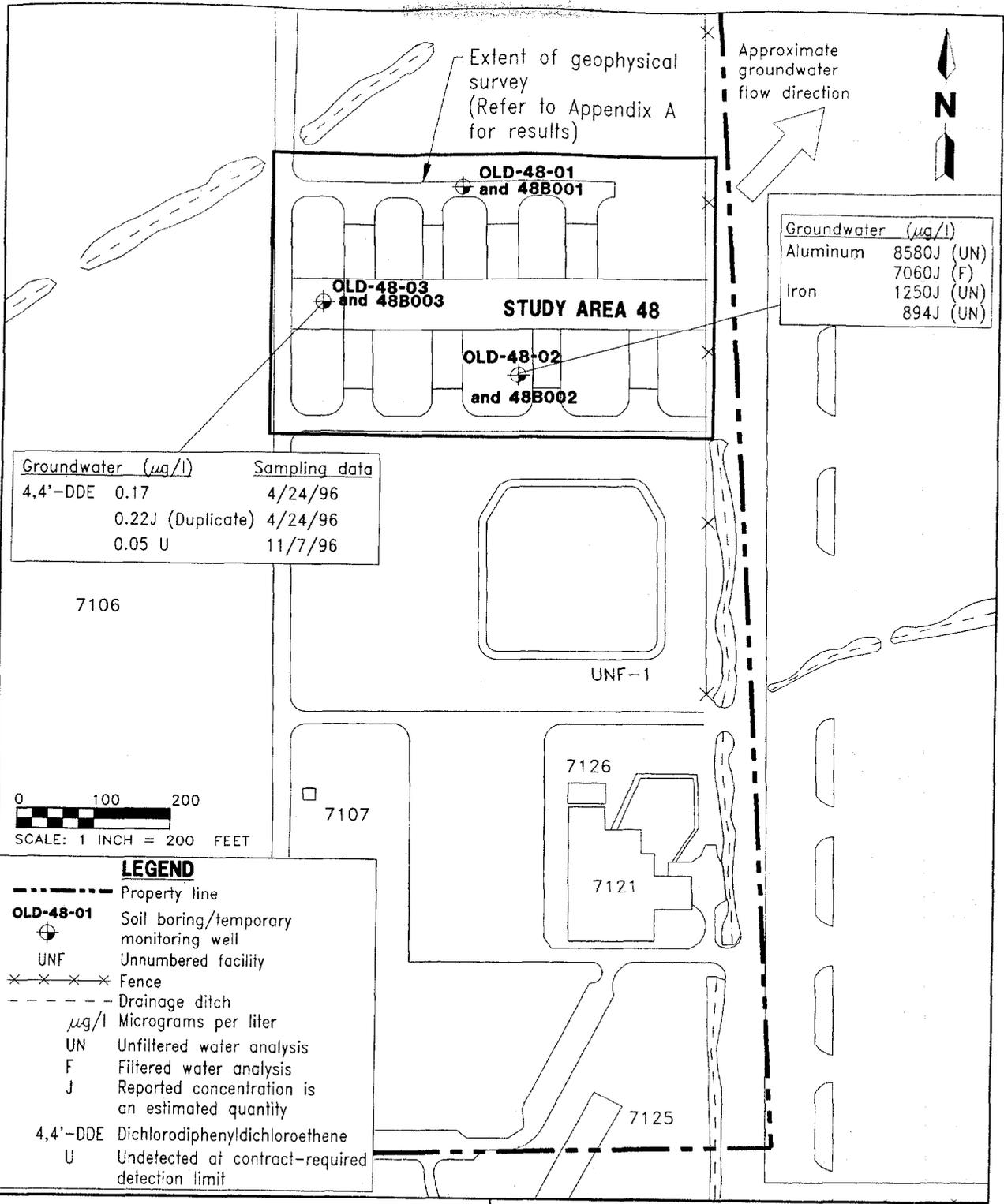


FIGURE 3
SAMPLE LOCATIONS AND SCREENING RESULTS, FORMER HOBBY COMPLEX, MCCOY ANNEX



BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT, STUDY AREA 48

NAVAL TRAINING CENTER ORLANDO, FLORIDA

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1.3.3 Groundwater

1.3.3.1 **Inorganics** Inorganics, with the exception of aluminum and iron from monitoring well OLD-48-02, were detected at concentrations below the background screening concentrations for groundwater.

Aluminum and iron concentrations exceeded background screening levels, as well as State of Florida secondary standards for groundwater. Secondary standards have been established for Class G-I and G-II aquifers by the State, largely along Federal guidelines, to ensure that groundwater meets at least minimum criteria for taste, odor, and color, and does not pose a health risk.

Based on records reviews and interviews, there have been no known site activities that may have contributed to the observed exceedances of secondary standards for aluminum and iron in well OLD-48-02. The aluminum concentration in well OLD-48-02 was 8,580 micrograms per liter ($\mu\text{g}/\ell$) versus a background screening concentration of 4,067 $\mu\text{g}/\ell$. The iron concentration in well OLD-48-02 was 1,250 $\mu\text{g}/\ell$, slightly exceeding the background screening value of 1,227 $\mu\text{g}/\ell$. The filtered sample concentrations of these analytes decreased an average of 23 percent, suggesting that suspended solids may have contributed to the observed secondary standards exceedances. In addition, the groundwater sample from OLD-48-02 had the highest total suspended solids (84 milligrams per liter [mg/ℓ]) of the three groundwater samples taken in SA 48. Subsurface soil concentrations of these analytes did not exceed background screening concentrations with one exception: subsurface soil sample 48B00201 had an iron concentration of 945 milligrams per kilogram (mg/kg), slightly exceeding the background screening concentration of 829 mg/kg .

Analytes exceeding Florida secondary standards should also be compared with RBCs for tapwater published by the USEPA, Region III. The tapwater guidance concentrations for aluminum and iron are 37,000 and 11,000 $\mu\text{g}/\ell$, respectively. There were no other TAL metals exceedances, and groundwater parameters measured during sampling were within normal limits: pH in the three wells varied from 5.59 to 6.79, temperature from 23.5 to 26 degrees centigrade, conductivity from 268 to 450 micromhos per centimeter, and turbidity from 1.66 to 4.76 nephelometric turbidity units.

ABB-ES concludes that the aluminum and iron are naturally occurring, are not related to past site activities, and do not pose a risk to human health or the environment.

The results of all laboratory analyses are included in Appendices B and C as Table B-1, Summary of Positive Detections in Subsurface Soil Analytical Results, and Table C-1, Summary of Subsurface Soil Analytical Results.

1.3.3.2 **Organics** One organic compound was detected at a concentration exceeding screening criteria in the unfiltered groundwater sample and its duplicate from temporary well OLD-48-03. 4,4'-DDE was detected in the sample and its duplicate at concentrations (0.17 and 0.22 $\mu\text{g}/\ell$, respectively) slightly above the FDEP groundwater guidance concentration (0.1 $\mu\text{g}/\ell$), and the RBC for tap water (in the duplicate sample only; 0.2 $\mu\text{g}/\ell$). 4,4'-DDE was also detected in the subsurface soil sample from the corresponding boring location (at a concentration below all soil screening criteria, including the leachability-based SCG). In addition, 4,4'-DDE was not detected in downgradient well OLD-48-01. Alpha- and gamma-

chlordanes were also detected at concentrations of 0.15 and 0.13 $\mu\text{g}/\ell$ in well OLD-48-03. These levels exceed the tapwater RBCs for these compounds (0.052 $\mu\text{g}/\ell$), but are well below the Florida primary standard and Federal MCLs. Because the groundwater sample was unfiltered and collected from a temporary monitoring well, the detected concentration of DDE and chlordanes likely represent the presence of these compounds on suspended particulates, rather than dissolved concentrations. The suspended particulates were likely present because the temporary wells have no sandpack.

Monitoring well OLD-48-03 was resampled on November 7, 1996, for pesticides only to confirm the previous 4,4'-DDE detection. No compounds were detected at their respective reporting limits.

The results of all laboratory analyses are included in Appendices B and C as Table B-2, Summary of Positive Detections in Groundwater Analytical Results, and Table C-2 Summary of Groundwater Analytical Results.

1.4 STUDY AREA 48, CONCLUSIONS AND RECOMMENDATIONS. Based on available information and site screening data, it is concluded that site screening activities have identified no significant soil or groundwater contamination at SA 48. Additional geophysical surveys did not reveal the presence of potential USTs in the several anomalous zones identified during initial site screening activities. Although concentrations of 4,4'-DDE slightly exceeded FDEP groundwater guidance concentrations during the initial screening activities in April 1996, this compound was not detected during subsequent resampling in November 1996.

Aluminum and iron concentrations exceeded background screening values and State secondary standards for groundwater from one well location (OLD-48-02) during initial site screening activities, but ABB-ES concludes that these exceedances are naturally occurring, are not related to past site activities, and do not pose a risk to human health or the environment. However, future users of this property should be aware that the presence of aluminum and iron at the measured concentrations may render the groundwater from the surficial aquifer objectionable as a potable or irrigation water source.

ABB-ES recommends that SA 48 be made eligible for transfer, with no further requirement for evaluation, and that it be reclassified from 7/Gray to 1/White.

The undersigned members of the Base Realignment and Closure Cleanup Team (BCT) concur with the findings of the preceding investigation.

STUDY AREA 48

Nancy Rodriguez
U.S. Environmental Protection Agency, Region IV

6/19/97
Date

John Mitchell
Florida Department of Environmental Protection

6-19-97
Date

W. Eugene J. Brown
U.S. Department of the Navy

6-19-97
Date

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- ABB Environmental Services, Inc. (ABB-ES). 1995a. *Technical Memorandum, U.S. Air Force Site Records Search*. Prepared for Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOC) (December).
- ABB-ES. 1995b. *Site Screening Plan, Former Air Force Sites, Addendum 2*. Naval Training Center, Orlando, Florida. Prepared for SOUTHNAVFACENGCOC, North Charleston, South Carolina (December).
- ABB-ES. 1996a. *Technical Memorandum, Site Screening Investigation, Study Area 48*. Naval Training Center, Orlando, Florida. Prepared for SOUTHNAVFACENGCOC, North Charleston, South Carolina (September).
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APPENDIX A
GEOPHYSICAL SURVEY

TECHNICAL MEMORANDUM
METAL DETECTOR AND GROUND PENETRATING RADAR SURVEY
SITE SCREENING INVESTIGATIONS
STUDY AREA 48

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

INTRODUCTION. The following is a summary of the significant findings of the metal detector and ground penetrating radar (GPR) surveys that took place on January 15, 1996, and January 7, 1997, respectively, at Naval Training Center (NTC), Orlando. This survey took place at Study Area 48, the former auto hobby shop.

METAL DETECTOR SURVEY. A metal detector survey was performed in January 1996 at Study Area 48 in order to screen for potential buried underground storage tanks (USTs) and buried piping. The survey was conducted along a (nominal) 20-foot measurement grid with traverses running in a north-south orientation. A Fisher TW-6 Pipe and Cable Locator was used during this investigation. This tool is a fast and effective way to locate buried drums or other metallic containers, to trace underground utilities, to locate buried tanks, and to quickly screen large sites where metallic deposits are known or suspected.

A metal detector responds to the electrical conductivity of metal targets. The conductivity of such targets usually contrasts sharply with that of the medium surrounding them (air or soil). Although there are many different types and configurations of metal detectors, all of them consist of a transmitter and receiver. The transmitter creates an alternating (primary) magnetic field about the transmitter coil that is balanced, or nulled, in the receiver coil to cancel the effect of the primary field in the transmitter. When the transmitter is in the vicinity of a metal object, eddy currents are induced to flow in that object by the primary field generated by the transmitter. These eddy currents produce a secondary magnetic field that interacts with the primary field upsetting the existing balance (null) condition resulting in an output, normally to a meter or audio signal, or both.

The size of the response decreases at a rate inversely proportional to the sixth power of the depth of the object. In other words, if two identical objects vary in depth by a factor of two, the shallower object will create a metal detector response 64 times larger than the deeper object. Similarly, the larger the surface area of the object, the larger the metal detector response: the response is directly proportional to the cube of the surface area of an object. Therefore, a 55-gallon drum will produce a response many times larger than an iron bar with the same amount of steel in it.

GROUND PENETRATING RADAR SURVEY. A GPR survey was completed in January 1997 at Study Area 48 in order to further investigate results from the metal detector survey. A Geophysical Survey Systems Subsurface Interface Radar II with 500 megahertz antenna was used for this work.

The GPR technique uses high frequency radio waves to determine the presence of subsurface objects and structures. Energy is radiated downward into the subsurface from an antenna that is pulled slowly across the ground at speeds

varying from about 0.25 to 5 miles per hour, depending on the amount of detail desired and the nature of the target. The radio wave energy is reflected from surfaces where there is a contrast in the electrical properties of subsurface materials. These surfaces may be naturally occurring geologic horizons (e.g., soil layers, changes in moisture content, voids and fractures in bedrock) or manmade (e.g., buried utilities, tanks, drums). The reflected energy is processed and displayed as a continuous strip chart recording of distance versus time (where time can be thought of as proportional to depth).

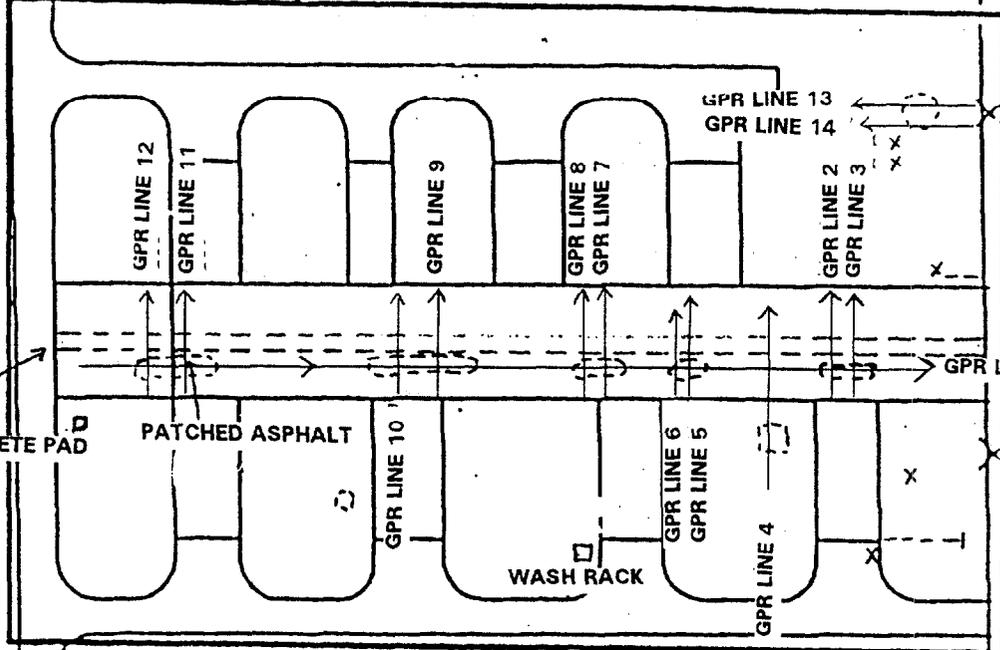
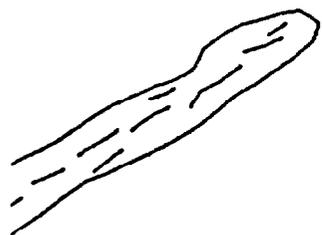
Typical applications for GPR include delineating the boundaries of buried hazardous waste materials and the perimeters of abandoned landfills; finding steel reinforcement bars and voids in concrete structures; and locating and mapping buried utilities.

RESULTS AND CONCLUSIONS. Several metal detector anomalies were mapped within the study area boundaries. These features are indicative of buried metallic materials, including a strong east-west anomaly in the central portion of the study area where partially buried railroad tracks may be observed. Whenever an anomaly was detected that could not be explained by objects at the surface, the field team would map the object with as many additional traverse lines oriented randomly as were required to define the object. The objective was to determine if that feature could possibly be a UST or potential buried pipe. In all, eight anomalous zones were mapped with the metal detector, along with several other point sources of limited extent (Figure 1). One of the anomalies is associated with an asphalt-covered area that has been patched. Because of the asphalt patch and the observed instrument response in this area, one possible interpretation is that the source of the anomaly at this location is a UST.

Because of this possibility, ABB Environmental Services, Inc. (ABB-ES) conducted a GPR survey over the areas with metal detector anomalies, focusing the investigation in the area of the potential UST. No buried objects were evident in the GPR data that suggest the presence of a UST. Therefore, ABB-ES concluded that there were no buried objects of environmental concern at Study Area 48.



Extent of metal detector survey

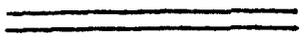


RAILROAD TRACKS

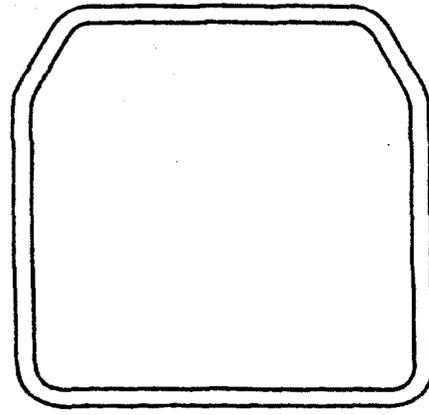
CONCRETE PAD

PATCHED ASPHALT

WASH RACK

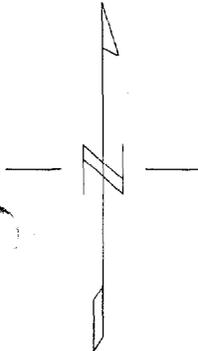


FOOTBALL



METAL DETECTOR ANOMALIES

POINT SOURCE METAL DETECTOR ANOMALIES



SOUTHERN DIVISION
GEOPHYSICAL SURVEY METAL DETECTOR AND GPR TRAVERSE LOCATIONS FORMER HOBBY COMPLEX
MCCOY ANNEX ABB ENVIRONMENTAL SERVICES, INC.
FIGURE 1

APPENDIX B

**SUMMARY OF DETECTIONS IN SOIL AND GROUNDWATER
ANALYTICAL RESULTS**

- B-1 Summary of Positive Detections in Subsurface Soil Analytical Results
- B-2 Summary of Positive Detections in Groundwater Analytical Results

TABLE B-1
SUMMARY OF POSITIVE DETECTIONS IN SUBSURFACE SOIL
ANALYTICAL RESULTS

Table B-1
 Summary of Positive Detections in Subsurface Soil Analytical Results
 Study Area 48

Naval Training Center, Orlando
 Orlando, FL

Identifier	Background Screening ¹	SCG ² for Residential Soil	RBC ³ for Residential Soil	RBC ³ for Industrial Soil	48B00101	48B00101D	48B00201	48B00301
Sampling Date					24-Apr-96	24-Apr-96	24-Apr-96	24-Apr-96
Feet bls					3.5-4.5	3.5-4.5	3-4	3.5-4.5
Volatile organics, ug/kg								
Xylene (total)		NA	160,000,000 n	1000,000,000 n	2 J	2 J		2 J
Semivolatile organics, ug/kg								
bis(2-Ethylhexyl)phthalate		NA	46,000 c	410,000 c	710	220 J	130 J	200 J
Pesticides/PCBs, ug/kg								
4,4'-DDE		200	1,900 c	17,000 c				3.2 J
alpha-Chlordane		NA	490 c	4,400 c	3.3			13
gamma-Chlordane		NA	490 c	4,400 c	3.2 J			11
Inorganics, mg/kg								
Aluminum	11,130	NA	78,000 n	1,000,000 n	3450	3220	3900	2340
Arsenic	2	NA	0.43 c/23 n	3.8 c/610 n	0.4 B	0.51 B	0.77 B	0.32 B
Barium	11.3	NA	5,500 n	140,000 n	2 J			
Calcium	321	NA	1,000,000	1,000,000	122 J	198 B	276 J	361 B
Chromium	11.3	NA	390 n ⁴	10,000 n ⁴	2.5	2.1 B	3.8	1.1 B
Cobalt	1.3	NA	4,700,000 n	120,000,000			0.4 B	
Copper	2.8	NA	3,100 n	82,000 n		0.57 B	0.77 B	0.53 B
Iron	829	NA	23,000 n	610,000 n	513	441	945	205
Lead	7	NA	400	400			3.5	
Magnesium	38.9	NA	460,468	460,468	46.9 B	42.5 B	55.2 B	37.8 B
Manganese	0.69	NA	1,800 n	47,000 n	0.98 J		1.3 J	
Mercury	0.12	NA	23 n	610 n	0.06 B	0.06 B	0.09 B	0.08 B
Vanadium	5.9	NA	550 n	14,000 n	1.7 J	1.3 J	4.5 J	0.38 J

Table B-1
Summary of Positive Detections in Subsurface Soil Analytical Results
Study Area 48

Naval Training Center, Orlando
Orlando, FL

NOTES:

¹ The background screening value is twice the average of detected concentrations for inorganic analytes.

² SCG = Soil Cleanup Goals for Florida (Florida Department of Environmental Protection memorandum, September 29, 1995). Leachability-based SCG for DDE applies because DDE was detected in groundwater at a concentration exceeding the Florida groundwater guidance concentration.

³ RBC = Risk-Based Concentration Table, USEPA Region III, May 1996, R.L. Smith. RBC for chromium is based on chromium VI. RBC for lead is not available, value is Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites (OSWER directive 9355-4-12). For essential nutrients (calcium, magnesium) screening values were derived based on recommended daily allowances (RDAs).

⁴ Values shown are for Chromium VI; values for Chromium III are 78,000 n and 1,000,000 n mg/kg.

n = noncarcinogenic effects.

c = carcinogenic effects.

NA = Not applicable.

bls = below land surface

mg/kg = milligrams per kilogram.

ug/kg = micrograms per kilogram.

FDEP = Florida Department of Environmental Protection

PCB = polychlorinated biphenyl.

OSWER = Office of Solid Waste and Emergency Response.

USEPA = U.S. Environmental Protection Agency.

B = Reported concentration is between the instrument detection limit (IDL) and Contract Required Detection Limit (CRDL).

J = Reported concentration is an estimated quantity.

All inorganics results expressed in milligrams per kilogram (mg/kg) soil dry weight; organics in micrograms per kilogram (ug/kg) soil dry weight.

Bold/shaded values indicate exceedance of regulatory guidance and background.

Blank space indicates analyte/compound was not detected at the reporting limit.

TABLE B-2

**SUMMARY OF POSITIVE DETECTIONS IN GROUNDWATER
ANALYTICAL RESULTS**

Table B-2
Summary of Positive Detections in Groundwater Analytical Results
Study Area 48

Naval Training Center, Orlando
Orlando, FL

Sample ID Sampling Date	Background ¹ Screening		FDEPG	Primary FEDMCL	RBC ² for Tap Water	48G00101		48H00101		48G00201		48H00201		48G00301		48H00301	
						24-Apr-96											
Semivolatile organics, ug/L																	
Di-n-butylphthalate			700 ⁴	ND	3,700 n	1 J	NA					NA					NA
Pesticides/PCBs, ug/L ¹³																	
4,4'-DDE			0.1 ⁷	ND	0.2 c				NA			NA	0.17				NA
alpha-Chlordane			2 ⁵	2	0.052 c				NA			NA	0.15 NJ				NA
gamma-Chlordane			2 ⁵	2	0.052 c				NA			NA	0.13				NA
Inorganics, ug/L																	
Aluminum	4,067		200 ³	ND	37,000 n	3130 J	367 J	8580 J	7060 J			1100 J					1270 J
Arsenic	5		50 ⁵	50 ⁸	0.045 c/ 11n			1.8 J									
Barium	31.4		2,000 ⁵	2,000	2,600 n							19.3 J					22.1 J
Beryllium			4 ⁵	4	0.016 c					0.19 B		0.23 B					
Calcium	36,830		ND	ND	1,000,000	43700	44000	55400		55100		90100					92700
Chromium	7.8		100 ⁵	100 ⁹	180 n ¹⁰	3.1 B				9.5 B		9.1 B					2.9 B
Cobalt			ND	ND	2,200 n					2.6 B							
Copper	5.4		1,000 ³	1300 ¹¹	1,500 n					5.8 B					4.8 B		
Iron	1,227		300 ³	ND	11,000 n	443 J		1250 J				894 J		130 J			153 J
Lead	4		15 ⁵	15 ¹²	15			6.3									
Magnesium	4,560		ND	ND	118,807	2330 B	2410 B	2220 B		2140 B		4770 B					4940 B
Manganese	17		50 ³	ND	840 n	6.6 B	6.8 B	7.7 B		8.3 B		30.1					27.1
Mercury	0.12		2 ⁵	2	11 n							0.08 J					
Potassium	5,400		ND	ND	297,016					1650 B		1610 B		1870 B			2150 B
Selenium	9.7		50 ⁵	50	180 n												
Sodium	18,222		160,000 ⁵	ND	396,022	1550 J	1810 J	1330 J		1380 J		2590 J					2780 J
Vanadium	20.6		49 ⁴	ND	260 n	2.7 B				9.6 B		7.4 B		3.6 B			4.6 B
General Chemistry, mg/L																	
Total Suspended Solids	ND		ND	ND	ND	35	NA	84		NA		17					NA

Table B-2
 Summary of Positive Detections in Groundwater Analytical Results
 Study Area 48

Naval Training Center, Orlando
 Orlando, FL

Sample ID	Background Screening	FDEPG	Primary FEDMCL	RBC ² for Tap Water	48G00301D		48H00301D		48G00302	
					24-Apr-96	24-Apr-96	24-Apr-96	24-Apr-96	7-Nov-96	
Sampling Date										
Semivolatile organics, ug/L										
Di-n-butylphthalate		700 ⁴	ND	3,700 n			NA		NA	
Pesticides/PCBs, ug/L¹³										
4,4'-DDE		0.1 ⁷	ND	0.2 c		0.22 J	NA		ND	
alpha-Chlordane		2 ⁵	2	0.052 c		0.22 NJ	NA		ND	
gamma-Chlordane		2 ⁵	2	0.052 c		0.19	NA		ND	
Inorganics, ug/L										
Aluminum	4,067	200 ³	ND	37,000 n		1110 J	1230 J		NA	
Arsenic	5	50 ⁵	50 ⁸	0.045 c/ 11n					NA	
Barium	31.4	2,000 ⁵	2,000	2,600 n		19 J	21.7 J		NA	
Beryllium		4 ⁵	4	0.016 c					NA	
Calcium	36,830	ND	ND	1,000,000		89600	91300		NA	
Chromium	7.8	100 ⁵	100 ⁹	180 n ¹⁰					NA	
Cobalt		ND	ND	2,200 n					NA	
Copper	5.4	1,000 ³	1300 ¹¹	1,500 n					NA	
Iron	1,227	300 ³	ND	11,000 n		134 J	135 J		NA	
Lead	4	15 ⁵	15 ¹²	15					NA	
Magnesium	4,560	ND	ND	118,807		4730 B	4900 B		NA	
Manganese	17	50 ³	ND	840 n		30	26.6		NA	
Mercury	0.12	2 ⁵	2	11 n			0.08 J		NA	
Potassium	5,400	ND	ND	297,016		2040 B	2070 B		NA	
Selenium	9.7	50 ⁵	50	180 n			1.7 J		NA	
Sodium	18,222	160,000 ⁵	ND	396,022		2530 J	2700 J		NA	
Vanadium	20.6	49 ⁴	ND	260 n		4 B	3.8 B		NA	
General Chemistry, mg/L										
Total Suspended Solids	ND	ND	ND	ND			NA		NA	

Table B-2
Summary of Positive Detections in Groundwater Analytical Results
Study Area 48

Naval Training Center, Orlando
Orlando, FL

NOTES:

¹ Groundwater background screening value is twice the average of detected concentrations for inorganic analytes.

² RBC = Risk-Based Concentration Table, USEPA Region III, May 1996, R.L. Smith. RBC for chromium is based on chromium VI. RBC for lead is not available, value is treatment technology action limit for lead in drinking water distribution system identified in Drinking Water Standards and Health Advisories (USEPA, 1995). For essential nutrients (calcium, magnesium, potassium, and sodium) screening values were derived based on recommended daily allowances (RDAs).

³ Secondary Standard.

⁴ Systemic Toxicant

⁵ Primary Standard

⁶ Organoleptic

⁷ Carcinogen

⁸ Interim standard.

⁹ Value is for total chromium.

¹⁰ Value is for Chromium VI; values for Chromium III is 37,000 n mg/kg.

¹¹ Value shown should be considered an action level. This value is the treatment level for copper.

¹² Value shown should be considered an action level. This value is the treatment level for lead, measured at a resident's tap.

¹³ Detections of pesticides 4,4'-DDE, alpha-Chlordane and gamma-Chlordane in Samples 48G00301 and 48G00301D were not confirmed on a sample taken on 11/7/96.

n = noncarcinogenic effects.

c = carcinogenic effects.

ND = Not determined.

NA = Not analyzed.

ID = identifier

USEPA = U.S. Environmental Protection Agency.

FDEPG = Florida Department of Environmental Protection, Groundwater Guidance Concentrations, June 1994.

FEDMCL = Federal Maximum Contaminant Levels, Primary Drinking Water Regulations and Health Advisories, October 1996.

B = Reported concentration is between the instrument detection limit (IDL) and the contract required detection limit (CRDL).

I = Reported concentration is an estimated quantity.

NJ = Presumptive presence of the compound at an estimated concentration

ug/l = micrograms per liter.

mg/l = milligrams per liter.

Bold/shaded numbers indicate exceedance of groundwater guidance and background.

Blank space indicates analyte/compound was not detected at the reporting limit.

APPENDIX C

SUMMARY OF ANALYTICAL RESULTS

- C-1 Summary of Subsurface Soil Analytical Results
- C-2 Summary of Groundwater Analytical Results

TABLE C-1
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS

Table C-1
Summary of Soil Analytical Results
Study Area 48

Naval Training Center, Orlando
Orlando, FL

Sample ID	48B00101	48B00101D	48B00201	48B00301
Lab ID	MA809004	MA809005	MA809002	MA809003
Sampling Date	24-Apr-96	24-Apr-96	24-Apr-96	24-Apr-96
Volatile organics, ug/kg				
1,1,1-Trichloroethane	12 U	12 U	12 U	12 U
1,1,2,2-Tetrachloroethane	12 U	12 U	12 U	12 U
1,1,2-Trichloroethane	12 U	12 U	12 U	12 U
1,1-Dichloroethane	12 U	12 U	12 U	12 U
1,1-Dichloroethene	12 U	12 U	12 U	12 U
1,2-Dichloroethane	12 U	12 U	12 U	12 U
1,2-Dichloroethene (total)	12 U	12 U	12 U	12 U
1,2-Dichloropropane	12 U	12 U	12 U	12 U
2-Butanone	12 U	12 U	12 U	12 U
2-Hexanone	12 U	12 U	12 U	12 U
4-Methyl-2-pentanone	12 U	12 U	12 U	12 U
Acetone	12 U	12 U	12 U	12 U
Benzene	12 U	12 U	12 U	12 U
Bromodichloromethane	12 U	12 U	12 U	12 U
Bromoform	12 U	12 U	12 U	12 U
Bromomethane	12 U	12 U	12 U	12 U
Carbon disulfide	12 U	12 U	12 U	12 U
Carbon tetrachloride	12 U	12 U	12 U	12 U
Chlorobenzene	12 U	12 U	12 U	12 U
Chloroethane	12 U	12 U	12 U	12 U
Chloroform	12 U	12 U	12 U	12 U
Chloromethane	12 U	12 U	12 U	12 U
cis-1,3-Dichloropropene	12 U	12 U	12 U	12 U
Dibromochloromethane	12 U	12 U	12 U	12 U
Ethylbenzene	12 U	12 U	12 U	12 U
Methylene chloride	12 U	12 U	12 U	12 U
Styrene	12 U	12 U	12 U	12 U
Tetrachloroethene	12 U	12 U	12 U	12 U
Toluene	12 U	12 U	12 U	12 U
trans-1,3-Dichloropropene	12 U	12 U	12 U	12 U
Trichloroethene	12 U	12 U	12 U	12 U
Vinyl chloride	12 U	12 U	12 U	12 U
Xylene (total)	2 J	2 J	12 U	2 J
Semivolatile organics, ug/kg				
1,2,4-Trichlorobenzene	390 U	390 U	400 U	390 U
1,2-Dichlorobenzene	390 U	390 U	400 U	390 U
1,3-Dichlorobenzene	390 U	390 U	400 U	390 U
1,4-Dichlorobenzene	390 U	390 U	400 U	390 U
2,2'-oxybis(1-Chloropropane)	390 U	390 U	400 U	390 U
2,4,5-Trichlorophenol	970 U	970 U	990 U	980 U
2,4,6-Trichlorophenol	390 U	390 U	400 U	390 U
2,4-Dichlorophenol	390 U	390 U	400 U	390 U
2,4-Dimethylphenol	390 U	390 U	400 U	390 U
2,4-Dinitrophenol	970 U	970 U	990 U	980 U
2,4-Dinitrotoluene	390 U	390 U	400 U	390 U
2,6-Dinitrotoluene	390 U	390 U	400 U	390 U
2-Chloronaphthalene	390 U	390 U	400 U	390 U
2-Chlorophenol	390 U	390 U	400 U	390 U
2-Methylnaphthalene	390 U	390 U	400 U	390 U
2-Methylphenol	390 U	390 U	400 U	390 U

Table C-1
Summary of Soil Analytical Results
Study Area 48

Naval Training Center, Orlando
Orlando, FL

Sample ID	48B00101	48B00101D	48B00201	48B00301
Lab ID	MA809004	MA809005	MA809002	MA809003
Sampling Date	24-Apr-96	24-Apr-96	24-Apr-96	24-Apr-96
2-Nitroaniline	970 U	970 U	990 U	980 U
2-Nitrophenol	390 U	390 U	400 U	390 U
3,3'-Dichlorobenzidine	390 U	390 U	400 U	390 U
3-Nitroaniline	970 U	970 U	990 U	980 U
4,6-Dinitro-2-methylphenol	970 U	970 U	990 U	980 U
4-Bromophenyl-phenylether	390 U	390 U	400 U	390 U
4-Chloro-3-methylphenol	390 U	390 U	400 U	390 U
4-Chloroaniline	390 U	390 U	400 U	390 U
4-Chlorophenyl-phenylether	390 U	390 U	400 U	390 U
4-Methylphenol	390 U	390 U	400 U	390 U
4-Nitroaniline	970 U	970 U	990 U	980 U
4-Nitrophenol	970 U	970 U	990 U	980 U
Acenaphthene	390 U	390 U	400 U	390 U
Acenaphthylene	390 U	390 U	400 U	390 U
Anthracene	390 U	390 U	400 U	390 U
Benzo(a)anthracene	390 U	390 U	400 U	390 U
Benzo(a)pyrene	390 U	390 U	400 U	390 U
Benzo(b)fluoranthene	390 U	390 U	400 U	390 U
Benzo(g,h,i)perylene	390 U	390 U	400 U	390 U
Benzo(k)fluoranthene	390 U	390 U	400 U	390 U
bis(2-Chloroethoxy)methane	390 U	390 U	400 U	390 U
bis(2-Chloroethyl)ether	390 U	390 U	400 U	390 U
bis(2-Ethylhexyl)phthalate	710	220 J	130 J	200 J
Butylbenzylphthalate	390 U	390 U	400 U	390 U
Carbazole	390 U	390 U	400 U	390 U
Chrysene	390 U	390 U	400 U	390 U
Di-n-butylphthalate	390 U	390 U	400 U	390 U
Di-n-octylphthalate	390 U	390 U	400 U	390 U
Dibenz(a,h)anthracene	390 U	390 U	400 U	390 U
Dibenzofuran	390 U	390 U	400 U	390 U
Diethylphthalate	390 U	390 U	400 U	390 U
Dimethylphthalate	390 U	390 U	400 U	390 U
Fluoranthene	390 U	390 U	400 U	390 U
Fluorene	390 U	390 U	400 U	390 U
Hexachlorobenzene	390 U	390 U	400 U	390 U
Hexachlorobutadiene	390 U	390 U	400 U	390 U
Hexachlorocyclopentadiene	390 U	390 U	400 U	390 U
Hexachloroethane	390 U	390 U	400 U	390 U
Indeno(1,2,3-cd)pyrene	390 U	390 U	400 U	390 U
Isophorone	390 U	390 U	400 U	390 U
N-Nitroso-di-n-propylamine	390 U	390 U	400 U	390 U
N-Nitrosodiphenylamine (1)	390 U	390 U	400 U	390 U
Naphthalene	390 U	390 U	400 U	390 U
Nitrobenzene	390 U	390 U	400 U	390 U
Pentachlorophenol	970 U	970 U	990 U	980 U
Phenanthrene	390 U	390 U	400 U	390 U
Phenol	390 U	390 U	400 U	390 U
Pyrene	390 U	390 U	400 U	390 U
Pesticides/PCBs, ug/kg				
4,4'-DDD	3.8 U	3.8 U	3.9 UJ	3.9 U
4,4'-DDE	3.8 U	3.8 U	3.9 UJ	3.2 J

Table C-1
Summary of Soil Analytical Results
Study Area 48

Naval Training Center, Orlando
Orlando, FL

Sample ID	48B00101	48B00101D	48B00201	48B00301
Lab ID	MA809004	MA809005	MA809002	MA809003
Sampling Date	24-Apr-96	24-Apr-96	24-Apr-96	24-Apr-96
4,4'-DDT	3.8 U	3.8 U	3.9 UJ	3.9 U
Aldrin	2 U	2 U	2 UJ	2 U
alpha-BHC	2 UJ	2 UJ	2 UJ	2 UJ
alpha-Chlordane	3.3	2 U	2 UJ	13
Aroclor-1016	38 U	38 U	39 UJ	39 U
Aroclor-1221	78 U	78 U	80 UJ	79 U
Aroclor-1232	38 U	38 U	39 UJ	39 U
Aroclor-1242	38 U	38 U	39 UJ	39 U
Aroclor-1248	38 U	38 U	39 UJ	39 U
Aroclor-1254	38 U	38 U	39 UJ	39 U
Aroclor-1260	38 U	38 U	39 UJ	39 U
beta-BHC	2 U	2 U	2 UJ	2 U
delta-BHC	2 U	2 U	2 UJ	2 U
Dieldrin	3.8 U	3.8 U	3.9 UJ	3.9 U
Endosulfan I	2 U	2 U	2 UJ	2 U
Endosulfan II	3.8 U	3.8 U	3.9 UJ	3.9 U
Endosulfan sulfate	3.8 U	3.8 U	3.9 UJ	3.9 U
Endrin	3.8 U	3.8 U	3.9 UJ	3.9 U
Endrin aldehyde	3.8 U	3.8 U	3.9 UJ	3.9 U
Endrin ketone	3.8 U	3.8 U	3.9 UJ	3.9 U
gamma-BHC (Lindane)	2 U	2 U	2 UJ	2 U
gamma-Chlordane	3.2 J	2 U	2 UJ	11
Heptachlor	2 U	2 U	2 UJ	2 U
Heptachlor epoxide	2 U	2 U	2 UJ	2 U
Methoxychlor	20 UJ	20 UJ	20 UJ	20 UJ
Toxaphene	200 U	200 U	200 UJ	200 U
Inorganics, ug/kg				
Aluminum	3450	3220	3900	2340
Antimony	2.5 U	2.5 U	2.6 U	2.6 U
Arsenic	0.4 B	0.51 B	0.77 B	0.32 B
Barium	2 J	1.9 U	3.2 U	1.8 U
Beryllium	0.04 U	0.03 U	0.04 U	0.04 U
Cadmium	0.42 U	0.57 U	0.43 U	0.42 U
Calcium	122 J	198 B	276 J	361 B
Chromium	2.5	2.1 B	3.8	1.1 B
Cobalt	0.35 U	0.35 U	0.4 B	0.35 U
Copper	0.47 U	0.57 B	0.77 B	0.53 B
Iron	513	441	945	205
Lead	1.4 U	1.5 U	3.5	1.2 U
Magnesium	46.9 B	42.5 B	55.2 B	37.8 B
Manganese	0.98 J	0.84 U	1.3 J	0.64 U
Mercury	0.06 B	0.06 B	0.09 B	0.08 B
Nickel	1.8 U	1.8 U	1.8 U	1.8 U
Potassium	179 U	179 U	182 U	181 U
Selenium	0.31 U	0.31 U	0.31 U	0.31 U
Silver	0.51 UJ	0.51 UJ	0.52 UJ	0.52 UJ
Sodium	25 U	24.7 U	32.2 U	28 U
Thallium	0.2 U	0.2 U	0.2 UJ	0.2 U
Vanadium	1.7 J	1.3 J	4.5 J	0.38 J
Zinc	2.2 U	1.6 U	3 U	2.8 U

TABLE C-2

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Table C-2
Summary of Groundwater Analytical Results
Study Area 48

Naval Training Center, Orlando
Orlando, FL

Sample ID	48G00101	48H00101	48G00201	48H00201	48G00301	48H00301	48G00301D	48H00301D	48G00302
Lab ID	MA810007	MA810008	MA810001	MA810002	MA810003	MA810004	MA810005	MA810006	1681-001
Sampling Date	24-Apr-96	7-Nov-96							
Volatile organics, ug/L									
1,1,1-Trichloroethane	1 U	NA	NA						
1,1,2,2-Tetrachloroethane	1 U	NA	NA						
1,1,2-Trichloroethane	1 U	NA	NA						
1,1-Dichloroethane	1 U	NA	NA						
1,1-Dichloroethene	1 U	NA	NA						
1,2-Dibromo-3-chloropropane	1 U	NA	NA						
1,2-Dibromoethane	1 U	NA	NA						
1,2-Dichloroethane	1 U	NA	NA						
1,2-Dichloropropane	1 U	NA	NA						
2-Butanone	5 UR	NA	NA						
2-Hexanone	5 U	NA	NA						
4-Methyl-2-pentanone	5 U	NA	NA						
Acetone	2 R	NA	2 R	NA	3 R	NA	2 R	NA	NA
Benzene	1 U	NA	NA						
Bromochloromethane	1 U	NA	NA						
Bromodichloromethane	1 U	NA	NA						
Bromoform	1 U	NA	NA						
Bromomethane	1 U	NA	NA						
Carbon disulfide	1 U	NA	NA						
Carbon tetrachloride	1 U	NA	NA						
Chlorobenzene	1 U	NA	NA						
Chloroethane	1 U	NA	NA						
Chloroform	1 U	NA	NA						
Chloromethane	1 U	NA	NA						
cis-1,2-Dichloroethene	1 U	NA	NA						
cis-1,3-Dichloropropene	1 U	NA	NA						
Dibromochloromethane	1 U	NA	NA						
Ethylbenzene	1 U	NA	NA						
Methylene chloride	2 U	NA	NA						
Styrene	1 U	NA	NA						
Tetrachloroethene	1 U	NA	NA						
Toluene	1 U	NA	NA						

Table C-2
Summary of Groundwater Analytical Results
Study Area 48

Naval Training Center, Orlando
Orlando, FL

Sample ID	48G00101	48H00101	48G00201	48H00201	48G00301	48H00301	48G00301D	48H00301D	48G00302
Lab ID	MA810007	MA810008	MA810001	MA810002	MA810003	MA810004	MA810005	MA810006	1681-001
Sampling Date	24-Apr-96	7-Nov-96							
trans-1,2-Dichloroethene	1 U	NA	NA						
trans-1,3-Dichloropropene	1 U	NA	NA						
Trichloroethene	1 U	NA	NA						
Vinyl chloride	1 U	NA	NA						
Xylene (total)	1 U	NA	NA						
Semivolatile organics, ug/L									
1,2,4-Trichlorobenzene	10 U	NA	NA						
1,2-Dichlorobenzene	1 U	NA	NA						
1,3-Dichlorobenzene	1 U	NA	NA						
1,4-Dichlorobenzene	1 U	NA	NA						
2,2'-oxybis(1-Chloropropane)	10 U	NA	NA						
2,4,5-Trichlorophenol	25 U	NA	NA						
2,4,6-Trichlorophenol	10 U	NA	NA						
2,4-Dichlorophenol	10 U	NA	NA						
2,4-Dimethylphenol	10 U	NA	NA						
2,4-Dinitrophenol	25 U	NA	NA						
2,4-Dinitrotoluene	10 U	NA	NA						
2,6-Dinitrotoluene	10 U	NA	NA						
2-Chloronaphthalene	10 U	NA	NA						
2-Chlorophenol	10 U	NA	NA						
2-Methylnaphthalene	10 U	NA	NA						
2-Methylphenol	10 U	NA	NA						
2-Nitroaniline	25 U	NA	NA						
2-Nitrophenol	10 U	NA	NA						
3,3'-Dichlorobenzidine	10 U	NA	NA						
3-Nitroaniline	25 U	NA	NA						
4,6-Dinitro-2-methylphenol	25 U	NA	NA						
4-Bromophenyl-phenylether	10 U	NA	NA						
4-Chloro-3-methylphenol	10 U	NA	NA						
4-Chloroaniline	10 U	NA	NA						
4-Chlorophenyl-phenylether	10 U	NA	NA						
4-Methylphenol	10 U	NA	NA						
4-Nitroaniline	25 U	NA	NA						

Table C-2
Summary of Groundwater Analytical Results
Study Area 48

Naval Training Center, Orlando
Orlando, FL

Sample ID	48G00101	48H00101	48G00201	48H00201	48G00301	48H00301	48G00301D	48H00301D	48G00302
Lab ID	MA810007	MA810008	MA810001	MA810002	MA810003	MA810004	MA810005	MA810006	1681-001
Sampling Date	24-Apr-96	7-Nov-96							
4-Nitrophenol	25 U	NA	NA						
Acenaphthene	10 U	NA	NA						
Acenaphthylene	10 U	NA	NA						
Anthracene	10 U	NA	NA						
Benzo(a)anthracene	10 U	NA	NA						
Benzo(a)pyrene	10 U	NA	NA						
Benzo(b)fluoranthene	10 U	NA	NA						
Benzo(g,h,i)perylene	10 U	NA	NA						
Benzo(k)fluoranthene	10 U	NA	NA						
bis(2-Chloroethoxy)methane	10 U	NA	NA						
bis(2-Chloroethyl)ether	10 U	NA	NA						
bis(2-Ethylhexyl)phthalate	10 U	NA	NA						
Butylbenzylphthalate	10 U	NA	NA						
Carbazole	10 U	NA	NA						
Chrysene	10 U	NA	NA						
Di-n-butylphthalate	1 J	NA	10 U	NA	10 U	NA	10 U	NA	NA
Di-n-octylphthalate	10 U	NA	NA						
Dibenz(a,h)anthracene	10 U	NA	NA						
Dibenzofuran	10 U	NA	NA						
Diethylphthalate	10 U	NA	NA						
Dimethylphthalate	10 U	NA	NA						
Fluoranthene	10 U	NA	NA						
Fluorene	10 U	NA	NA						
Hexachlorobenzene	10 U	NA	NA						
Hexachlorobutadiene	10 U	NA	NA						
Hexachlorocyclopentadiene	10 U	NA	NA						
Hexachloroethane	10 U	NA	NA						
Indeno(1,2,3-cd)pyrene	10 U	NA	NA						
Isophorone	10 U	NA	NA						
N-Nitroso-di-n-propylamine	10 U	NA	NA						
N-Nitrosodiphenylamine (1)	10 U	NA	NA						
Naphthalene	10 U	NA	NA						
Nitrobenzene	10 U	NA	NA						

Table C-2
Summary of Groundwater Analytical Results
Study Area 48

Naval Training Center, Orlando
Orlando, FL

Sample ID	48G00101	48H00101	48G00201	48H00201	48G00301	48H00301	48G00301D	48H00301D	48G00302
Lab ID	MA810007	MA810008	MA810001	MA810002	MA810003	MA810004	MA810005	MA810006	1681-001
Sampling Date	24-Apr-96	7-Nov-96							
Pentachlorophenol	25 U	NA	NA						
Phenanthrene	10 U	NA	NA						
Phenol	10 U	NA	NA						
Pyrene	10 U	NA	NA						
Pesticides/PCBs, ug/L									
4,4'-DDD	0.1 UJ	NA	0.1 U	NA	0.1 U	NA	0.1 U	NA	0.05 U
4,4'-DDE	0.1 UJ	NA	0.1 U	NA	0.17	NA	0.22 J	NA	0.05 U
4,4'-DDT	0.1 UJ	NA	0.1 U	NA	0.1 U	NA	0.1 U	NA	0.1 U
Aldrin	0.05 UJ	NA	0.05 U	NA	0.05 U	NA	0.05 U	NA	0.05 U
alpha-BHC	0.05 UJ	NA	0.05 U						
alpha-Chlordane	0.05 UJ	NA	0.05 U	NA	0.15 NJ	NA	0.22 NJ	NA	0.05 U
Aroclor-1016	0.5 UJ	NA	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.05 U
Aroclor-1221	0.5 UJ	NA	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.05 U
Aroclor-1232	0.5 UJ	NA	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.05 U
Aroclor-1242	0.5 UJ	NA	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.05 U
Aroclor-1248	0.5 UJ	NA	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.05 U
Aroclor-1254	0.5 UJ	NA	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.05 U
Aroclor-1260	0.5 UJ	NA	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.05 U
beta-BHC	0.05 UJ	NA	0.05 U	NA	0.05 U	NA	0.05 U	NA	0.05 U
delta-BHC	0.05 UJ	NA	0.05 U	NA	0.05 U	NA	0.05 U	NA	0.05 U
Dieldrin	0.1 UJ	NA	0.1 U	NA	0.1 U	NA	0.1 U	NA	0.05 U
Endosulfan I	0.05 UJ	NA	0.05 U	NA	0.05 U	NA	0.05 U	NA	0.05 U
Endosulfan II	0.1 UJ	NA	0.1 U	NA	0.1 U	NA	0.1 U	NA	0.1 U
Endosulfan sulfate	0.1 UJ	NA	0.1 U	NA	0.1 U	NA	0.1 U	NA	0.1 U
Endrin	0.1 UJ	NA	0.1 U	NA	0.1 U	NA	0.1 U	NA	0.05 U
Endrin aldehyde	0.1 UJ	NA	0.1 U	NA	0.1 U	NA	0.1 U	NA	0.1 U
Endrin ketone	0.1 UJ	NA	0.1 U	NA	0.1 U	NA	0.1 U	NA	0.1 U
gamma-BHC (Lindane)	0.05 UJ	NA	0.05 U	NA	0.05 U	NA	0.05 U	NA	0.05 U
gamma-Chlordane	0.05 UJ	NA	0.05 U	NA	0.13	NA	0.19	NA	0.05 U
Heptachlor	0.05 UJ	NA	0.05 U	NA	0.05 U	NA	0.05 U	NA	0.05 U
Heptachlor epoxide	0.05 UJ	NA	0.05 U	NA	0.1 U	NA	0.15 U	NA	0.05 U
Methoxychlor	0.5 UJ	NA	0.2 U						
Toxaphene	5 UJ	NA	5 U	NA	5 U	NA	5 U	NA	1 U

Table C-2
Summary of Groundwater Analytical Results
Study Area 48

Naval Training Center, Orlando
Orlando, FL

Sample ID	48G00101	48H00101	48G00201	48H00201	48G00301	48H00301	48G00301D	48H00301D	48G00302
Lab ID	MA810007	MA810008	MA810001	MA810002	MA810003	MA810004	MA810005	MA810006	1681-001
Sampling Date	24-Apr-96	7-Nov-96							
Inorganics, ug/L									
Aluminum	3130 J	367 J	8580 J	7060 J	1100 J	1270 J	1110 J	1230 J	NA
Antimony	1.8 R	1.5 R	1.9 R	2.4 R	2.1 R	2.5 R	1.6 R	1.9 R	NA
Arsenic	1.3 UJ	1.3 UJ	1.8 J	1.3 UJ	NA				
Barium	7.2 U	6.7 U	11.8 U	10.6 U	19.3 J	22.1 J	19 J	21.7 J	NA
Beryllium	0.15 U	0.15 U	0.19 B	0.23 B	0.15 U	0.15 U	0.15 U	0.15 U	NA
Cadmium	1.8 UJ	NA							
Calcium	43700	44000	55400	55100	90100	92700	89600	91300	NA
Chromium	3.1 B	2.2 U	9.5 B	9.1 B	2.2 U	2.9 B	2.2 U	2.2 U	NA
Cobalt	1.5 U	1.5 U	2.6 B	1.5 U	NA				
Copper	2 U	2 U	5.8 B	2 U	4.8 B	2 U	2 U	2 U	NA
Iron	443 J	26.8 U	1250 J	894 J	130 J	153 J	134 J	135 J	NA
Lead	1.2 U	1.2 U	6.3	3.7 U	1.2 U	1.2 U	1.2 U	1.2 U	NA
Magnesium	2330 B	2410 B	2220 B	2140 B	4770 B	4940 B	4730 B	4900 B	NA
Manganese	6.6 B	6.8 B	7.7 B	8.3 B	30.1	27.1	30	26.6	NA
Mercury	0.07 UJ	0.07 UJ	0.07 UJ	0.08 J	0.07 UJ	0.07 UJ	0.07 UJ	0.08 J	NA
Nickel	7.7 U	NA							
Potassium	767 U	767 U	1650 B	1610 B	1870 B	2150 B	2040 B	2070 B	NA
Selenium	1.3 U	1.7 J	NA						
Silver	2.2 UR	NA							
Sodium	1550 J	1810 J	1330 J	1380 J	2590 J	2780 J	2530 J	2700 J	NA
Thallium	0.86 U	0.86 U	0.86 U	0.86 U	0.86 UJ	0.86 UJ	0.86 UJ	0.86 UJ	NA
Vanadium	2.7 B	1.6 U	9.6 B	7.4 B	3.6 B	4.6 B	4 B	3.8 B	NA
Zinc	4.4 U	9.4 U	12.6 U	5.4 U	23.3 U	24.7 U	19.6 U	22.5 U	NA
General Chemistry, mg/L									
Total Suspended Solids	35	NA	84	NA	17	NA	NA	NA	NA

Notes for Analytical Results Tables
Study Area 48

Naval Training Center, Orlando
Orlando Florida

NA = Identified parameter not analyzed.
Sample ID = Sample Identifier
Lab ID = Laboratory identifier

Units:

mg/kg milligram per kilogram
ug/kg microgram per kilogram
mg/L milligram per liter
ug/L microgram per liter

The following standard validation qualifiers have the following definitions:

- U The analyte/compound was analyzed for but was not detected above the reported sample quantitation limit. The number preceding the U qualifier is the reported sample quantitation limit.
- J The analyte/compound was positively identified and the associated numerical value is an estimated concentration of the analyte/compound in the sample.
- B The analyte was positively identified and the associated numerical value is an estimated concentration because the detection was below the contract required detection limit (CRDL) and above the instrument detection limit.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- NJ The analysis indicates the presence of a compound that has been tentatively identified, and the associated numerical value represents an estimated concentration.
- UJ The analyte/compound was not detected above the reported sample quantitation limit. The reported quantitation limit, however, is approximate and may or may not represent the actual limit of quantitation necessary to accurately measure the analyte/compound in the sample.
- R The sample results are rejected during data validation because of serious deficiencies in meeting quality control criteria.

APPENDIX D

**SOIL BORING LOGS, TEMPORARY MONITORING WELL INSTALLATION
DIAGRAMS, AND GROUNDWATER SAMPLE FIELD DATA**

Project: BRAC NTC		Site: S.A. 48		Boring ID: OLD-48-01	
Client: SOUTHDIYNAVFACENCOM				Job No.: 8519.10	
Contractor: ABB-ES			Date started: 04/24/98		Compltd: 04/24/98
Method: Hand Auger		Casing Size: 3-1/2" ID	Screen Int.: 5 ft.	Protection level: D	
Ground Elev.:		Type of OVM.: Porta FID II	Total depth: 8Ft.	Dpth to ∇ 4 Ft.	
Logged by: WDO		Material: PVC			

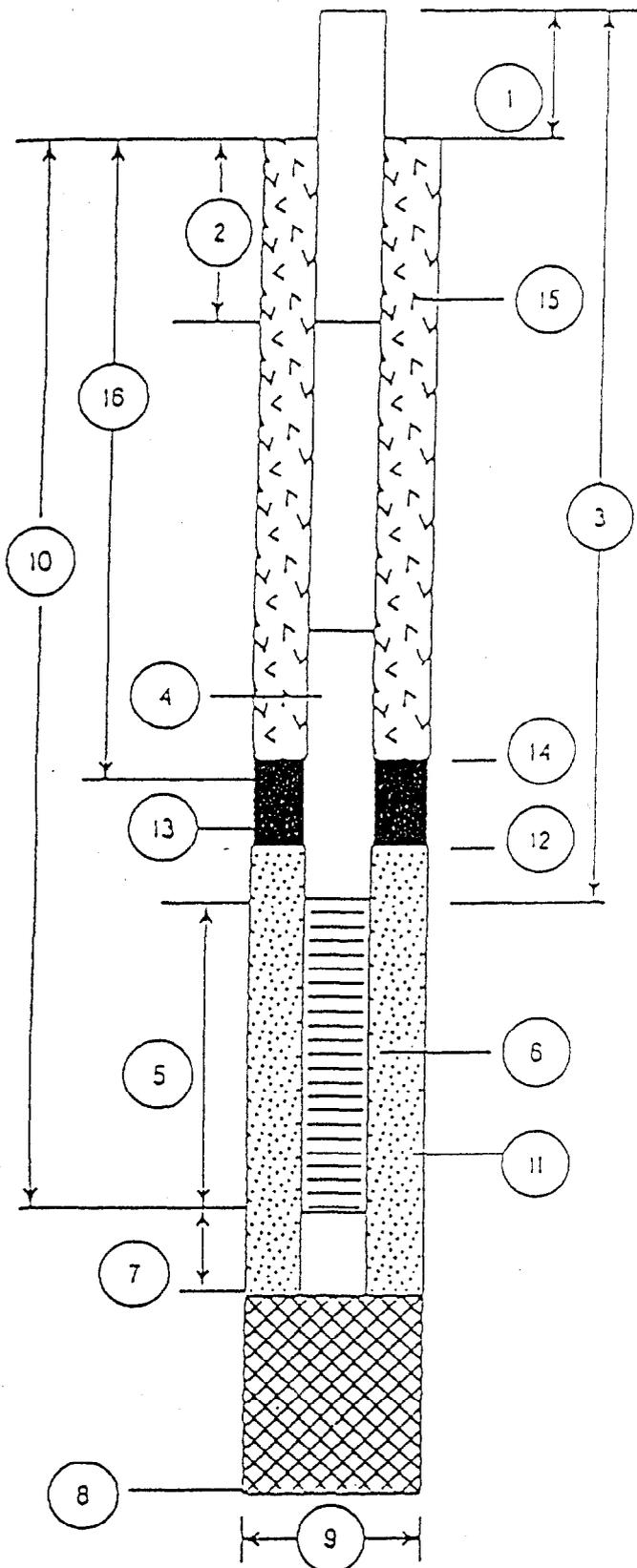
Depth Ft.	Sample ID (Depth) (Type)	Split Spoon	Recovery	Headspace (ppm)	Soil/Rock Description and comments	Lithologic symbol	Soil class.	Blows/6-in.
				0	Limerock fill			
				0	Brown fine SAND		SP	
				0	Gray fine SAND and SILT		SM	
				0	Red brown fine SAND		SP	
5	48B00101 48B0010D 3.5-4.5' CLP			0				
					Boring terminated at 8 feet bgs			
10								

DEPARTMENT OF THE NAVY
 SOUTHERN DIVISION
 NAVAL FACILITIES ENGINEERING COMMAND
 CHARLESTON, SC.

WELL CONSTRUCTION DETAIL

WELL NUMBER: 01A-48-01

DATE OF INSTALLATION: 4/22/46



1. Height of Casing above ground: +

2. Depth to first Coupling: 1'

Coupling Interval Depths: 1'

3. Total Length of Riser Pipe: 2'

4. Type of Riser Pipe: 2" DIA, SCH 40 PVC

5. Length of Screen: 5'

6. Type of Screen: 2" DIA, SCH 40 PVC (60" SIRT)

7. Length of Sump: 2"

8. Total Depth of Boring: 6'

9. Diameter of Boring: 3"

10. Depth to Bottom of Screen: 6'

11. Type of Screen Filter: X

Quantity Used: X

Size: +

12. Depth to Top of Filter: X

13. Type of Seal: X

Quantity Used: X

14. Depth to Top of Seal: X

15. Type of Grout: X

Grout Mixture: X

Method of Placement: X

16. Tot. Depth of 6 in. Steel Casing: NH

X WELL CONSTRUCTED AS TEMPORARY
 WELL USING HAND AUGER

Project: BRAC NTC		Site: S.A. 48		Boring ID: OLD-48-02	
Client: SOUTHDIYNAVFACENGCOM				Job No.: 8519.10	
Contractor: ABB-ES			Date started: 04/24/98		Compltd: 04/24/98
Method: Hand Auger		Casing Size: 3-1/2" ID	Screen Int.: 5 ft.	Protection level: D	
Ground Elev.:		Type of OVM: Porta FID II	Total depth: 8Ft.	Dpth to ∇ 4 Ft.	
Logged by: WDO		Material: PVC			

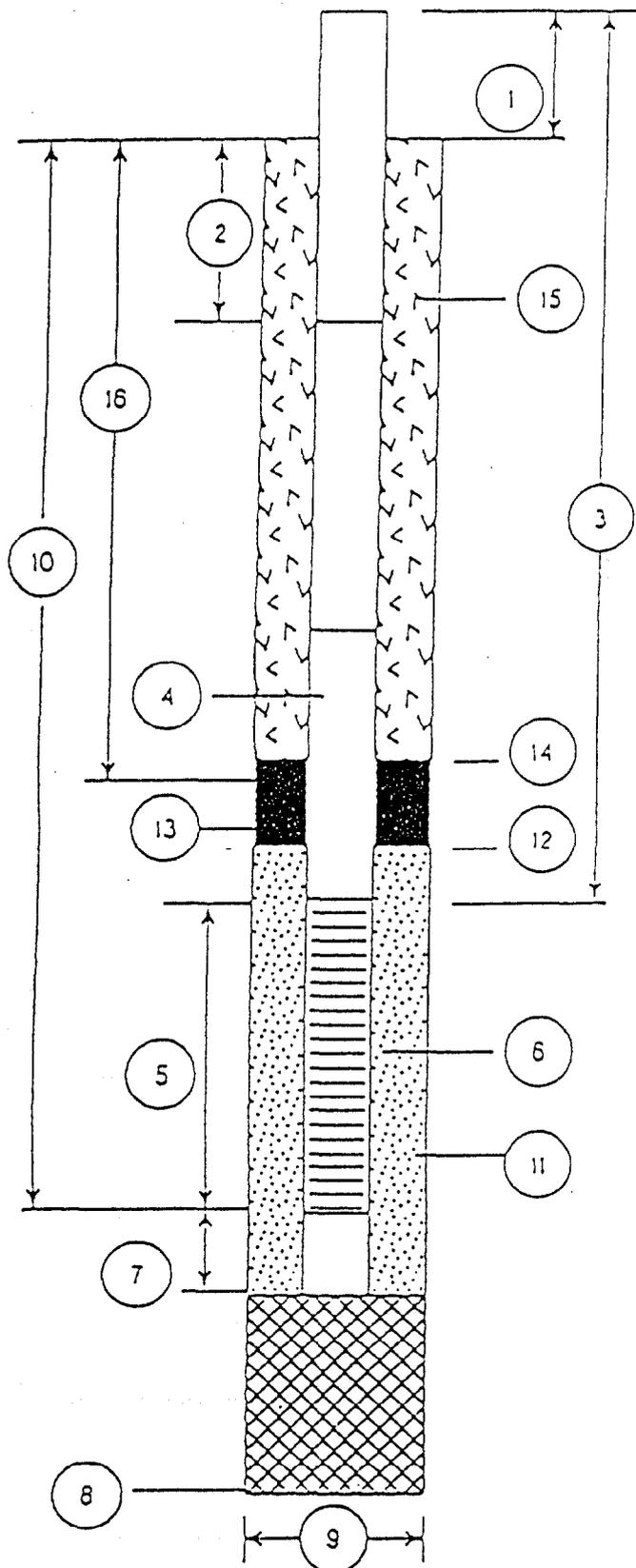
Depth Ft.	Sample ID (Depth) (Type)	Split Spoon	Recovery	Headspace (ppm)	Soil/Rock Description and comments	Lithologic symbol	Soil class.	Blows/6-in.
				0	Gray-brown silty fine SAND		SM	
	48B00201 (MS/MSD) 3-4' CLP			0	Tan, medium and fine SAND with silt		SP	
5				0	Black silty SAND		SM	
					Boring terminated at 8 feet bgs			

DEPARTMENT OF THE NAVY
 SOUTHERN DIVISION
 NAVAL FACILITIES ENGINEERING COMMAND
 CHARLESTON, SC.

WELL CONSTRUCTION DETAIL

WELL NUMBER: OLD-48-02

DATE OF INSTALLATION: 4/24/96



1. Height of Casing above ground: *
2. Depth to first Coupling: 1'
Coupling Interval Depths: 1'
3. Total Length of Riser Pipe: 2'
4. Type of Riser Pipe: 2" DIA., SCH 40 PVC
5. Length of Screen: 5'
6. Type of Screen: 2" DIA., SCH 40 PVC (60" SLO)
7. Length of Sump: 2"
8. Total Depth of Boring: 6'
9. Diameter of Boring: 3"
10. Depth to Bottom of Screen: 6'
11. Type of Screen Filter: *
- Quantity Used: * Size: *
12. Depth to Top of Filter: *
13. Type of Seal: *
- Quantity Used: *
14. Depth to Top of Seal: *
15. Type of Grout: *
- Grout Mixture: *
- Method of Placement: *
18. Tol. Depth of 6 in. Steel Casing: N/A

* WELL CONSTRUCTED AS TEMPORARY WELL USING HAND AUGER.

GROUNDWATER SAMPLE FIELD DATA

Project: NTC-ORLANDO Point of Interest: OLD-4B-CZ
 Project Number: 85A.10 Date: 4/24/96
 Sample Location ID: 48G-00201
 Time: Start: 1030 End: 1110 Signature of Sampler: J. M. [unclear] FOR WSC

Water Level/Well Data

Well Depth 6' Ft. Measured Top of Well Top of Protective Casing
 Historical Top of Protective Casing
 Well Riser Stick-up Ft. (from ground) Protective Ft. Casing/Well Difference
 Protective Ft. Casing
 Depth to Water 4 Ft. Well Material: PVC Well Locked?: Yes No
 SS No
 Well Dia. 2 inch 4 inch 6 inch
 Water Level Equip. Used: Elect. Cond. Probe Float Activated Press. Transducer
 Height of Water Column 1.6 Gal/R. (2 in.) 85 Gal/R. (4 in.) 1.5 Gal/R. (8 in.) Gal/R. (in.)
 Ft. [2.8 Gal/Vol] Total Gal Purged 10
 Well Integrity: Prot. Casing Secure Concrete Collar Intact Other
 Yes No

X TEMPORARY WELL

Equipment Documentation

Purging/Sampling Equipment Used :

Decontamination Fluids Used :

	(✓ if Used For)			
Purging	<input checked="" type="checkbox"/>	Peristaltic Pump	Equipment ID	(✓ All That Apply at Location)
Sampling	<input checked="" type="checkbox"/>	Submersible Pump	<u>10A</u>	<input type="checkbox"/> Methanol (100%)
	<input type="checkbox"/>	Baler		<input type="checkbox"/> 25% Methanol/75% ASTM Type II water
	<input type="checkbox"/>	PVC/Silicon Tubing		<input checked="" type="checkbox"/> Deionized Water
	<input type="checkbox"/>	Teflon/Silicon Tubing		<input checked="" type="checkbox"/> Liquinox Solution
	<input type="checkbox"/>	Airfit		<input type="checkbox"/> Hexane
	<input type="checkbox"/>	Hand Pump		<input type="checkbox"/> HNO ₃ /D.I. Water Solution
	<input type="checkbox"/>	In-line Filter		<input checked="" type="checkbox"/> Potable Water
	<input type="checkbox"/>	Press/Vac Filter		<input type="checkbox"/> None

Field Analysis Data

Ambient Air VOC 0 ppm Well Mouth 0 ppm Field Data Collected In-line Turbid Clear Cloudy
 In Container Colored Odor

Purge Data	6 Gal.	7 Gal.	8 Gal.	9 Gal.	10 Gal.
Temperature, Deg. C	<u>23</u>	<u>23.5</u>	<u>23.5</u>	<u>23.5</u>	<u>23.5</u>
pH, units	<u>6.7</u>	<u>6.7</u>	<u>6.7</u>	<u>6.7</u>	<u>6.8</u>
Specific Conductivity (umhos/cm. @ 25 Deg. C.)	<u>285</u>	<u>188</u>	<u>289</u>	<u>377</u>	<u>288</u>
Oxidation-Reduction, mv	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Dissolved Oxygen, ppm	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>

TURBIDITY 6.43 19.87 9.07 8.41 3.90

Sample Collection Requirements (✓ if Required at this Location)

Analytical Parameter	✓ if Field Filtered	Preservation Method	Volume Required	✓ if Sample Collected	Sample Bottle IDs
VOA	<input type="checkbox"/>	HCL	<u>3 x 40 ML</u>	<input checked="" type="checkbox"/>	<u>48</u> , <u>G</u> , <u>007</u> , <u>01</u>
SVCA	<input type="checkbox"/>	40C	<u>1 x 20</u>	<input checked="" type="checkbox"/>	<u>48</u> , <u>G</u> , <u>002</u> , <u>01</u>
Pes/PCB	<input type="checkbox"/>	40C	<u>1 x 20</u>	<input checked="" type="checkbox"/>	<u>48</u> , <u>G</u> , <u>002</u> , <u>01</u>
Inorganics	<input checked="" type="checkbox"/>	HNO ₃	<u>1 x 20</u>	<input checked="" type="checkbox"/>	<u>48</u> , <u>G</u> , <u>002</u> , <u>01</u>
Explosives	<input type="checkbox"/>	4°C		<input type="checkbox"/>	<u>48</u> , <u>H</u> , <u>002</u> , <u>01</u>
TPH	<input type="checkbox"/>	H ₂ SO ₄		<input type="checkbox"/>	
TOC	<input type="checkbox"/>	H ₂ SO ₄		<input type="checkbox"/>	
Nitrate	<input type="checkbox"/>	H ₂ SO ₄		<input type="checkbox"/>	

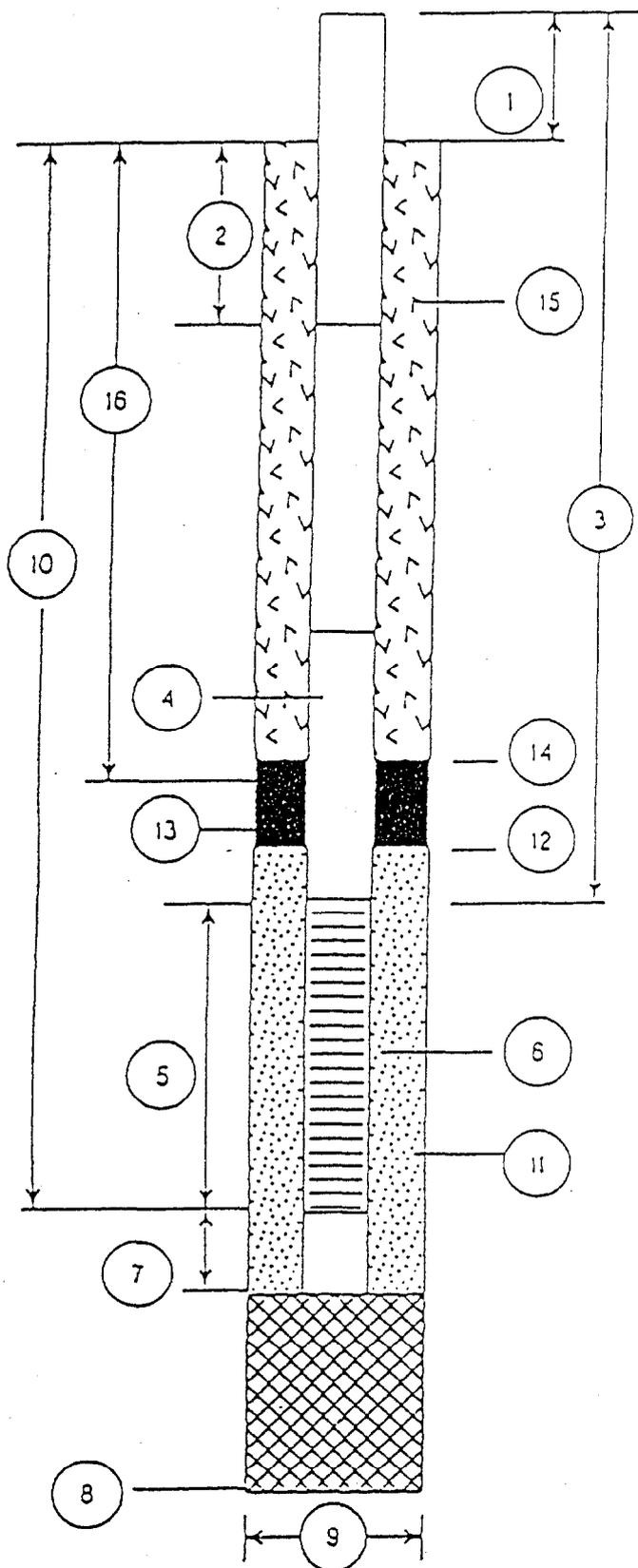
Notes: _____

DEPARTMENT OF THE NAVY
 SOUTHERN DIVISION
 NAVAL FACILITIES ENGINEERING COMMAND
 CHARLESTON, SC.

WELL CONSTRUCTION DETAIL

WELL NUMBER: OLD-48-03

DATE OF INSTALLATION: 4/24/96



1. Height of Casing above ground: *

2. Depth to first Coupling: 1'

Coupling Interval Depths: 1'

3. Total Length of Riser Pipe: 2'

4. Type of Riser Pipe: 2" DIA, SCH 40 PVC

5. Length of Screen: 5"

6. Type of Screen: 2" DIA, SCH 50 PVC

7. Length of Sump: 2" (0.01" SLOTT)

8. Total Depth of Boring: 6'

9. Diameter of Boring: 3"

10. Depth to Bottom of Screen: 6'

11. Type of Screen Filter: *

Quantity Used: *

Size: *

12. Depth to Top of Filter: *

13. Type of Seal: *

Quantity Used: *

14. Depth to Top of Seal: *

15. Type of Grout: *

Grout Mixture: *

Method of Placement: *

16. Tot. Depth of 6 in. Steel Casing: NA

* WELL CONSTRUCTED AS TEMPORARY WELL USING HAND AUGER.

GROUNDWATER SAMPLE FIELD DATA

Project: NTS - ORLANDO
 Project Number: 8545.10
 Sample Location ID: 48600302
 Time: Start: 0930 End: 1130

Point of Interest: OLD-48-03
 Date: 11-7-96

Signature of Sampler: B. Alford

Water Level/Well Data

Well Depth 980 Ft. Measured Top of Well
 Historical Top of Protective Casing

Well Riser Stick-up Ft. (from ground)

Protective Ft. Casing/Well Difference

Protective Ft. Casing

Depth to Water 780 Ft. Well Material: PVC Well Locked?: Yes No

Well Dia. 2 inch 4 inch 6 inch

Water Level Equip. Used: Elect. Cond. Probe Float Activated Press. Transducer

Height of Water Column 2 Ft. 1.6 Gal/R. (2 in.) 65 Gal/R. (4 in.) 1.5 Gal/R. (6 in.) Gal/R. (in.)

3 Gal/Vol

Well Integrity: Yes No

Prot. Casing Secure Concrete Collar Intact Other

7.5 Total Gal Purged

TEMPORARY WELL

Equipment Documentation

Purging/Sampling Equipment Used:

(<input checked="" type="checkbox"/> If Used For)		
Purging	Sampling	Equipment ID
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Peristaltic Pump
<input type="checkbox"/>	<input type="checkbox"/>	Submersible Pump
<input type="checkbox"/>	<input type="checkbox"/>	Baler
<input type="checkbox"/>	<input type="checkbox"/>	PVC/Silicon Tubing
<input type="checkbox"/>	<input type="checkbox"/>	Teflon/Silicon Tubing
<input type="checkbox"/>	<input type="checkbox"/>	Airlift
<input type="checkbox"/>	<input type="checkbox"/>	Hand Pump
<input type="checkbox"/>	<input type="checkbox"/>	In-line Filter
<input type="checkbox"/>	<input type="checkbox"/>	Press/Vac Filter

Decontamination Fluids Used:

(All That Apply at Location)

- Methanol (100%)
- 25% Methanol/75% ASTM Type II water
- Deionized Water
- Liquinox Solution
- Hexane
- HNO₃/D.I. Water Solution
- Potable Water
- None

Field Analysis Data

Ambient Air VOC 0 ppm Well Mouth 0 ppm Field Data Collected In-line In Container

Sample Observations: Turbid Clear Cloudy
 Colored Odor

Purge Data	4 Gal	5 Gal	5.5 Gal	6 Gal	7.5 Gal
Temperature, Deg. C	28	28	28	28	28
pH, units	6.3	6.12	6.23	6.25	6.3
Specific Conductivity (umhos/cm. @ 25 Deg. C.)	400	380	400	400	415
Oxidation - Reduction, w- mv	-	-	-	-	-
Dissolved Oxygen, ppm	-	-	-	-	-
TURBIDITY	14.21	29.5	13.27	9.06	11.07

Sample Collection Requirements
(If Required at this Location)

Analytical Parameter	<input checked="" type="checkbox"/> If Field Filtered	Preservation Method	Volume Required	<input checked="" type="checkbox"/> If Sample Collected	Sample Bottle IDs
VOA	<input type="checkbox"/>	HCL		<input type="checkbox"/>	/ / / /
SVOA	<input type="checkbox"/>	40C		<input type="checkbox"/>	/ / / /
Pest/PCB	<input type="checkbox"/>	40C	2x 141T	<input checked="" type="checkbox"/>	48 / 6 / 003 / 02
Inorganics	<input type="checkbox"/>	HNO ₃		<input type="checkbox"/>	/ / / /
Explosives	<input type="checkbox"/>	4°C		<input type="checkbox"/>	/ / / /
TPH	<input type="checkbox"/>	H ₂ SO ₄		<input type="checkbox"/>	/ / / /
TOC	<input type="checkbox"/>	H ₂ SO ₄		<input type="checkbox"/>	/ / / /
Nitrate	<input type="checkbox"/>	H ₂ SO ₄		<input type="checkbox"/>	/ / / /
Notes:	_____				

