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FINAL BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING
REPORT STUDY AREA 5 NTC ORLANDO FL
7/1/1996
ABB ENVIRONMENTAL

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

00037

STUDY AREA 5

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

Unit Identification Code: N65928

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

Prepared by:

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Naval Facilities Engineering Command
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North Charleston, South Carolina 29418**

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July 1996



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: July 17, 1996

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

NAME AND TITLE OF CERTIFYING OFFICIAL: Mark Salvetti
Project Technical Lead

(DFAR 252.227-7036)

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Study Area 5
Naval Training Center
Orlando, Florida

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GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
bls	below land surface
CLP	Contract Laboratory program
DQO	data quality objective
FID	flame ionization detector
FOST	Finding of Suitability to Transfer
mg/kg	milligrams per kilogram
µg/l	micrograms per liter
OPT	Orlando Partnering Team
RBC	risk-based concentration
RRVs	relative response values
TAL	target analyte list
TCL	target compound list
UNF	unnumbered facility
USEPA	U.S. Environmental Protection Agency

1.0 STUDY AREA 5, UNNUMBERED FACILITY (UNF)-13
(FORMER MOTOR BOAT RENTAL FACILITY)

This report contains information gathered as a result of site-screening activities conducted at Study Area 5. In the fall of 1995, after the review of site-screening results, the Orlando Partnering Team (OPT) determined that no further action was required at Study Area 5 and that the parcel was transferrable under the provisions of a Finding of Suitability to Lease or Finding of Suitability to Transfer (FOST).

1.1 STUDY AREA 5, BACKGROUND AND CONDITIONS. UNF-13 is a recreational area located along the western shoreline of Lake Baldwin (Figures 1 and 2). The Environmental Baseline Survey report indicates a motorboat rental and maintenance facility (Building S-2604) and an associated 1,500-gallon capacity septic system were operated at the site from 1962 to 1983 (ABB Environmental Services, Inc. [ABB-ES], 1994). Site-screening activities were initiated to evaluate potential contamination of soil or groundwater from past fueling and maintenance activities on the site.

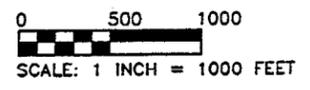
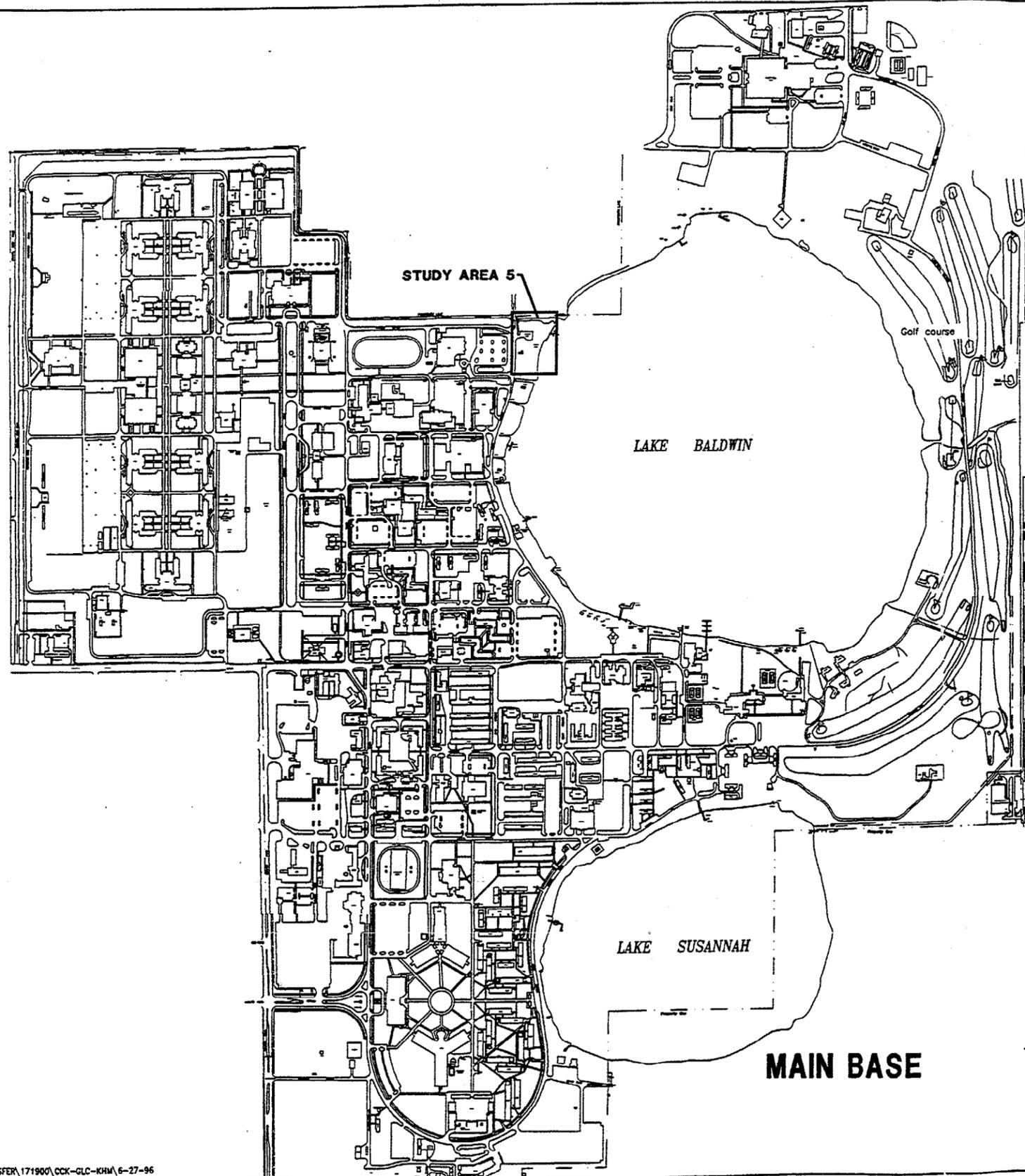
1.2 STUDY AREA 5, INVESTIGATION SUMMARY.

1.2.1 Geophysical Surveys Target areas for geophysical surveys were selected based upon a review of aerial photographs. Terrain conductivity, magnetic gradient, and ground-penetrating radar surveys were conducted to more accurately infer locations of the former motorboat rental and maintenance facility, and the septic tank and leach field. Geophysical data appear to confirm the location of the former building. The location of the former septic system was not confirmed with geophysics. Appendix A presents the results of the geophysical surveys.

1.2.2 Passive Soil Gas Survey Soil gas data are always semiquantitative, as multiple sources in soil and/or groundwater cannot be differentiated. Further, compound concentrations in each collector are compared on a relative basis, depending on whether or not the data are interpreted to be of high, moderate to high, moderate, etc., intensity. These qualitative soil gas values do not represent actual concentrations of the reported compounds. Efforts to relate soil gas response directly to groundwater or soil contaminant concentrations is generally not regarded as productive owing to the assumptions that are required for heterogeneity and source distribution.

Sixteen passive soil gas collectors were installed on 50-foot centers in the area where most of the geophysical anomalies occurred. Contour plots of relative response values (RRVs) indicated only isolated occurrences of elevated responses; therefore, soil gas data obtained at this study area were not a significant factor in the development of the groundwater sampling strategy for this study area. Appendix B presents the passive soil gas results.

1.2.3 Soil Boring Investigation Three soil borings were advanced at Study Area 5 using a hollow-stem auger drilling technique. The borings were located in the vicinity of, or hydraulically downgradient from, identified geophysical anomalies and/or zones with elevated RRVs. Soil samples were collected continuously and field-screened with a flame ionization detector (FID).



SOURCE: ABB-ES 1994b.

FIGURE 1
LOCATION OF STUDY AREA 5



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

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

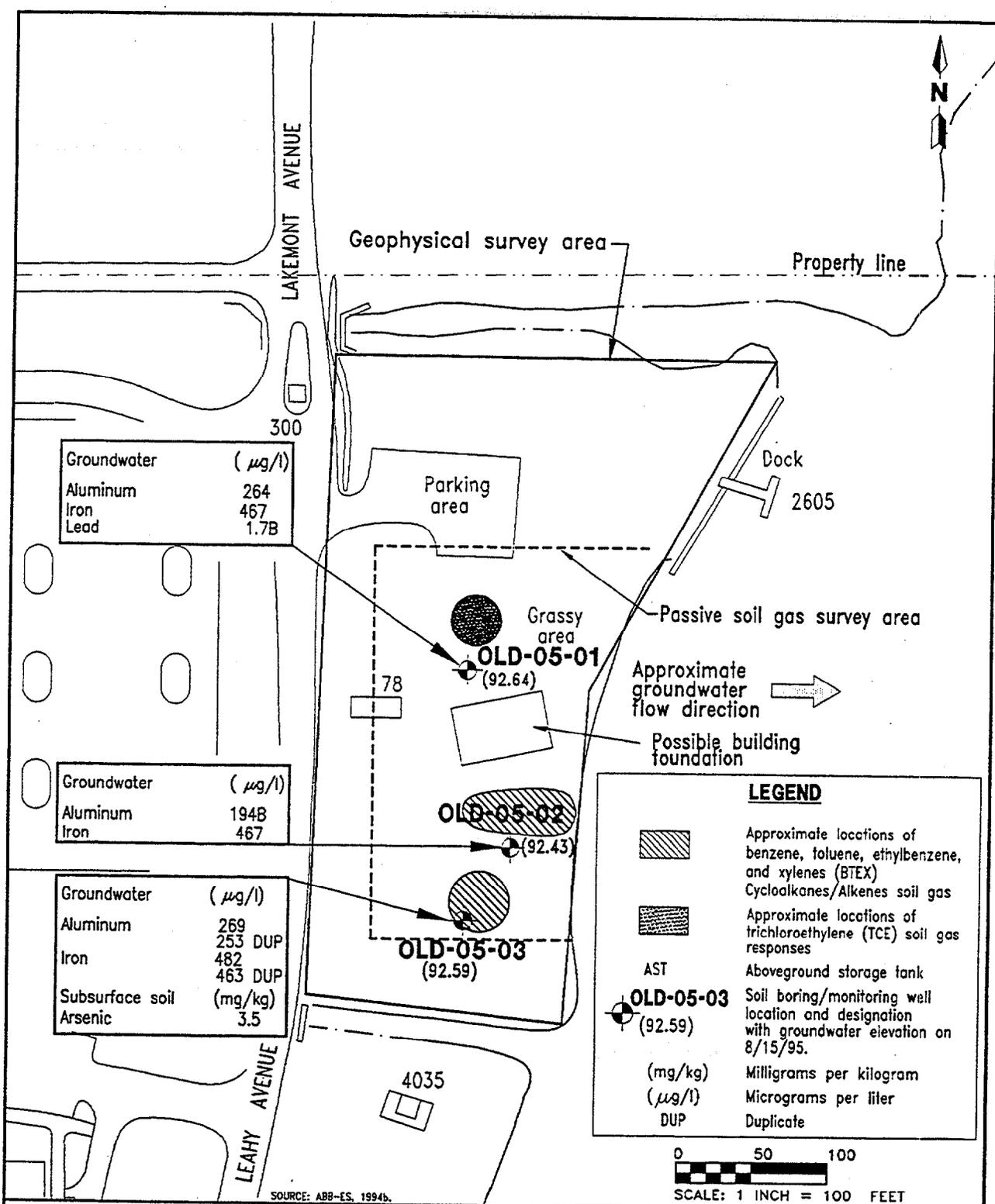


FIGURE 2
MONITORING WELL LOCATIONS, PASSIVE SOIL GAS SURVEY AND GEOPHYSICAL SURVEY LOCATIONS AT UNF-13, FORMER MOTORBOAT RENTAL AND MAINTENANCE AREA, STUDY AREA 5

HA\9585\171900\CCK-GLC-KMA\6-6-96



BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT
NAVAL TRAINING CENTER ORLANDO, FLORIDA

Elevated FID responses were detected 4 feet and 8 feet below land surface (bls) in boring 05B001 and 4 feet and 6 feet bls in boring 05B002. These locations were all below the estimated water table in each boring. One soil sample was collected from each boring from the deepest sample interval above the water table. Three soil samples (one from each boring) were submitted for full suite Contract Laboratory program (CLP) target compound list (TCL) and target analyte list (TAL) analyses, in accordance with U.S. Environmental Protection Agency (USEPA) Level IV data quality objectives (DQOs). Soil boring logs are included in Appendix C.

1.2.4 Groundwater Monitoring Well Installation and Sampling Each boring was completed as a monitoring well. Soil borings 05B001 through 05B003 correspond to monitoring wells OLD-05-01 through OLD-05-03, respectively. Because of the shallow water table at Study Area 5 (1 to 2 feet bls), it was not possible to install well screens across the water table. One groundwater sample from each monitoring well was submitted for full suite CLP TCL and TAL laboratory analyses in accordance with USEPA Level IV DQOs. Appendix C presents the monitoring well installation diagrams.

1.3 STUDY AREA 5, RESULTS. A summary of positive detections in soil and groundwater analytical results is presented in Appendix D. A complete set of soil and groundwater analytical results is presented in Appendix E.

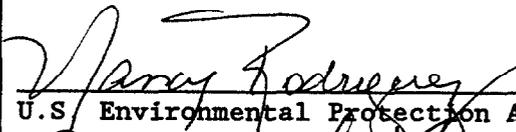
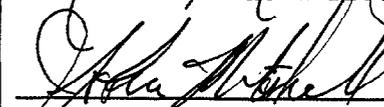
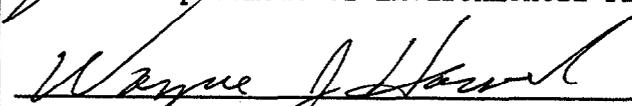
1.3.1 Soil Aluminum, arsenic, barium, calcium, copper, iron, lead, magnesium, mercury, selenium, and zinc in subsurface soil from borings 05B001 and/or 05B003 were detected at concentrations above background screening values. However, only arsenic (3.5B milligrams per kilogram [mg/kg]) in boring 05B003 exceeded a risk-based concentration (RBC). Both the residential (0.37 mg/kg) and industrial (3.3 mg/kg) RBCs for arsenic as a carcinogen were exceeded at this location. Di-n-butylphthalate was also detected in soil from boring 05B003, but at a concentration below the residential RBC. Leachability-based soil cleanup goal values do not apply, as no organic compounds were present in groundwater above Florida Department of Environmental Protection groundwater guidance concentrations (see below).

1.3.2 Groundwater Because all three monitoring wells at Study Area 5 are within 100 feet of Lake Baldwin, analytical results for groundwater have been compared to both drinking water standards (Federal maximum contaminant level) and surface water standards (Appendix D). No organic compounds were detected in Study Area 5 groundwater. All inorganics were detected at concentrations below the background screening values for groundwater. However, no background data set is available for surface water. Concentrations of aluminum in all three wells (up to 269 micrograms per liter [$\mu\text{g}/\ell$]) exceed the surface water standard of 50 $\mu\text{g}/\ell$. The concentration of lead in well OLD-05-01 (1.7B $\mu\text{g}/\ell$) exceeds the surface water standard of 1.4 $\mu\text{g}/\ell$.

1.4 STUDY AREA 5, CONCLUSIONS AND RECOMMENDATIONS. The results discussed above show no evidence of an impact to Study Area 5 soil or groundwater by the former motorboat rental operation. Although surface water standards for lead and aluminum were exceeded in groundwater, these exceedances are not likely indicative of contamination.

Based on the above results, ABB-ES recommends the color classification for Study Area 5 be changed from 7/Gray to 1/White, and further recommends an FOST with no requirement for further evaluation.

The undersigned members of the OPT concur with the findings of the preceding investigation.

<u>STUDY AREA 5</u>	
 _____ U.S. Environmental Protection Agency, Region IV	<u>7/24/96</u> _____ Date
 _____ Florida Department of Environmental Protection	<u>7/24/96</u> _____ Date
 _____ U.S. Department of the Navy	<u>7/24/96</u> _____ Date

REFERENCE

ABB Environmental Services, Inc., 1994, Final Draft Environmental Baseline Survey (EBS) Report, Naval Training Center, Orlando, Florida: prepared for Southern Division, Naval Facilities Engineering Command, Charleston, South Carolina.

APPENDIX A

GEOPHYSICAL SURVEYS

TECHNICAL MEMORANDUM
GEOPHYSICAL SURVEYS
SITE-SCREENING INVESTIGATIONS
STUDY AREA 5

The following is a summary of the significant findings of the geophysical surveys that took place between July 28 and August 23, 1994, at Naval Training Center, Orlando. Geophysical surveys took place at Study Area 5 - the Motorboat Rental and Maintenance Area.

Geophysical surveys at the former motorboat rental and maintenance area included a magnetometer and terrain conductivity (TC) survey (with a 10-foot-by-10-foot measurement grid), which was followed by a ground-penetrating radar survey (GPR). The purpose for the work was to determine the presence and location of the facility, the septic tank, and leach field.

The magnetic method is a versatile geophysical technique used for evaluating shallow geologic structures and for locating buried manmade objects and buried debris by mapping local distortions in the earth's magnetic field produced by buried magnetic objects (steel and other magnetic materials). Vertical gradient measurements of the earth's magnetic field are often taken during environmental magnetic surveys, as they are more sensitive to the presence of near-surface metal objects than total field values alone.

TC surveys, also referred to as EMI (electro-magnetic induction) surveys, have traditionally been used in mineral exploration for tracing conductive ore bodies (i.e., massive sulfides). More recently, conductivity surveys have been used in environmental studies for mapping buried debris and former structures, and for tracing conductive contaminant plumes in groundwater. TC instruments record two parameters: (1) the quadrature phase and (2) the inphase components of an induced magnetic field. The quadrature-phase component is a measure of the ground conductivity value expressed in millimhos per meter. The inphase component is significantly more sensitive to metallic objects and is useful for looking for buried tanks and drums and other manmade objects.

The GPR technique uses high frequency radio waves to determine the presence of subsurface objects and structures. The radio wave energy is reflected from surfaces where there is a contrast in the electrical properties of subsurface materials, such as naturally occurring geologic horizons or manmade objects (e.g., buried utilities, tanks, drums). Typical applications for GPR include mapping buried utilities and delineating the boundaries of buried hazardous waste materials and abandoned landfills.

Below is a discussion of the results.

Figure 8 shows the approximate location of the geophysical grid. Figures 9, 10, and 11 present the vertical gradient (magnetic) contours, quadrature (conductivity) contours, and inphase (roughly equivalent to a metal detector) contours for the geophysical data. Annotated surface features, which account for many of the stronger geophysical anomalies, are indicated on Figure 9. Also shown on Figure 9 is the location of an anomaly which probably represents the old building foundation. Also shown are two linear GPR anomalies, which are probably buried pipes. The pipe closest to the foundation may be related to the septic system for the former facility.

GEOPHYSICAL SURVEY AREA
40 EAST - WEST TRANSECTS @ 10 FT. SPACING
25 NORTH - SOUTH TRANSECTS @ 10 FT. SPACING
(TERRAIN CONDUCTIVITY, MAGNETOMETER, GROUND
PENETRATING RADAR)

PRC

LAKEMO

300

PARKING
AREA

GRASS
AREA

78

DOCK

2605

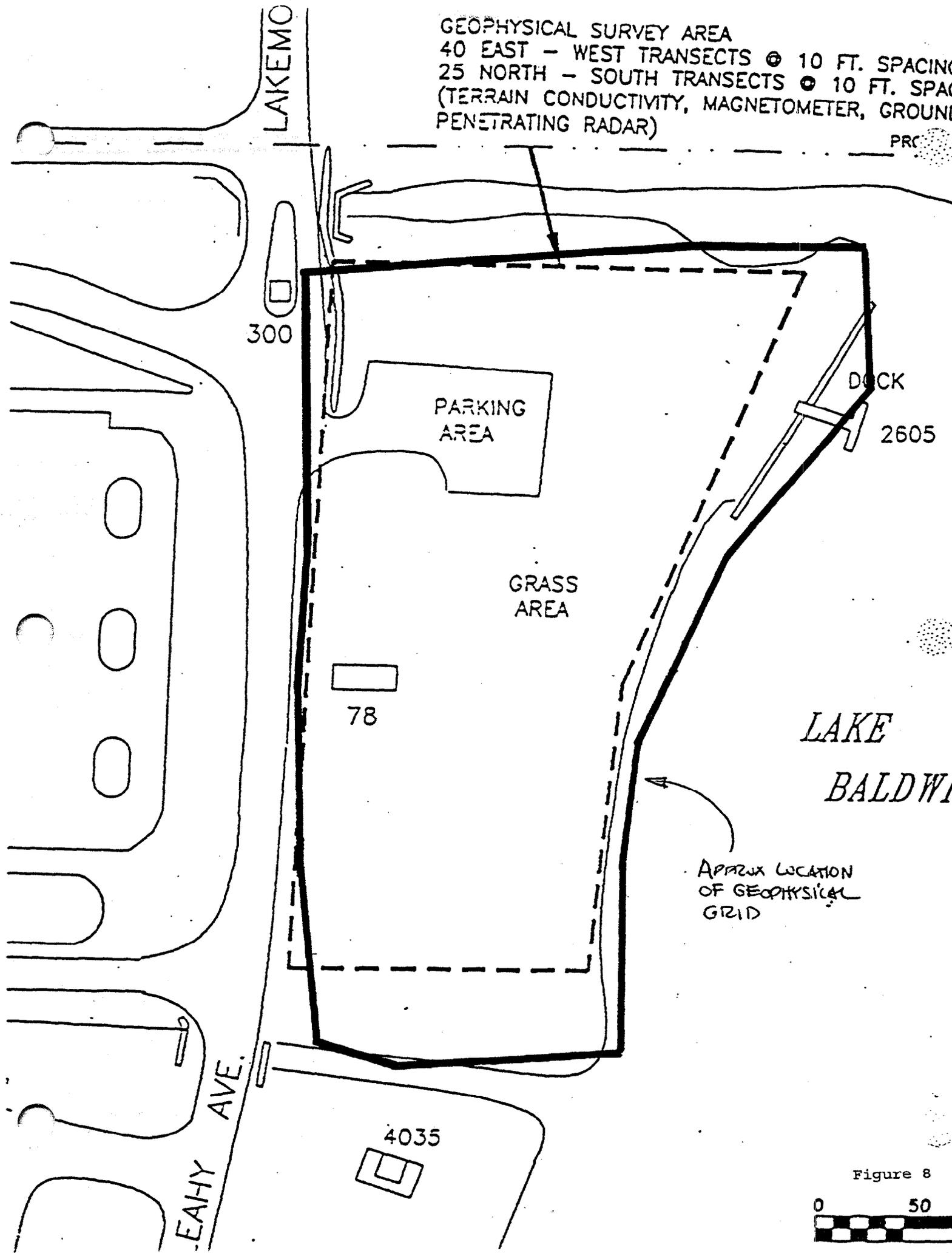
LAKE
BALDWI

APPROX LOCATION
OF GEOPHYSICAL
GRID

EAIHY AVE.

4035

Figure 8



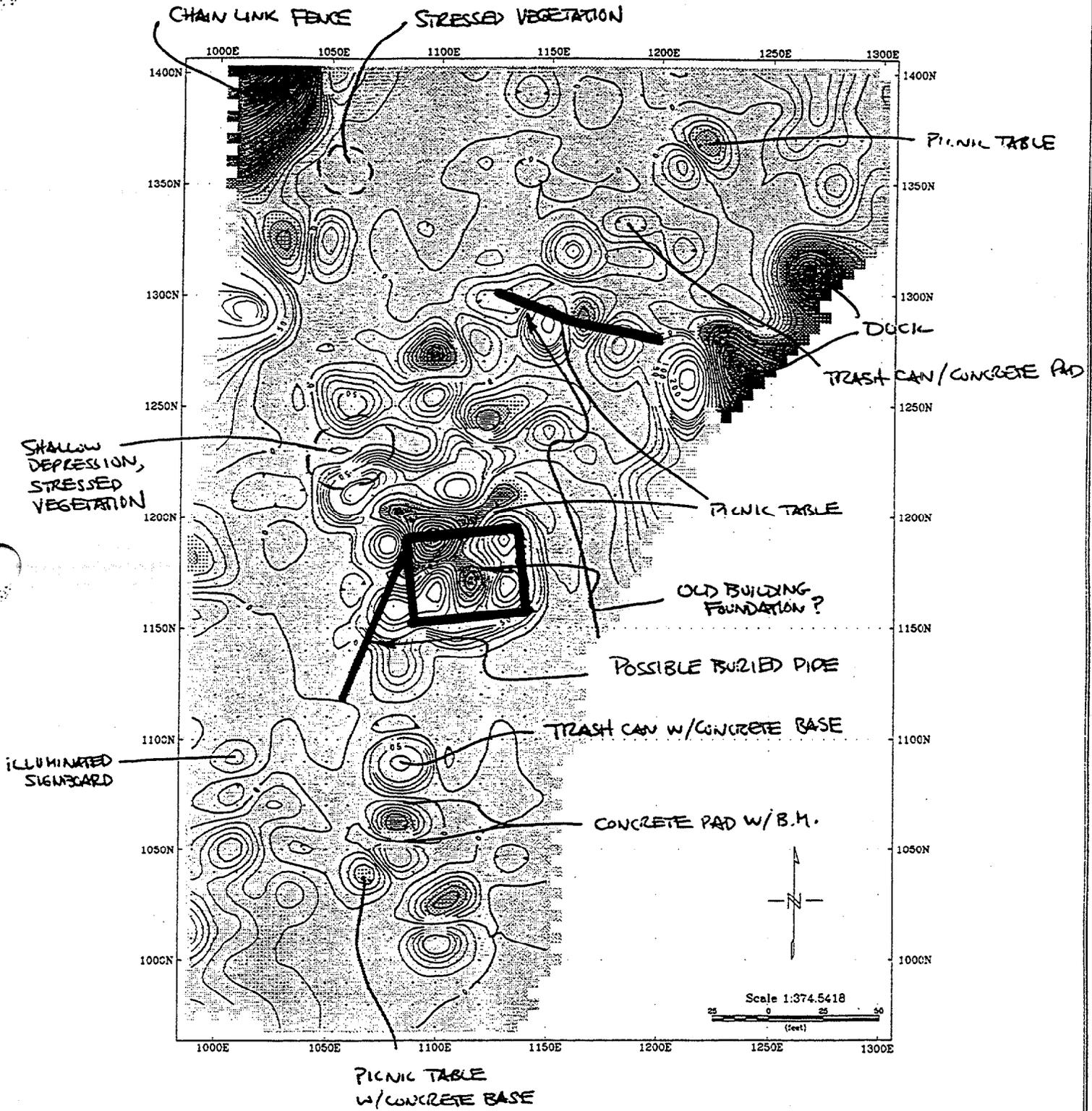


Figure 9

NAVY CLEAN
VERTICAL GRADIENT CONTOURS
SA 05 - FORMER BOAT RENTAL/MAINTENANCE
SSP - GROUP 1 STUDY AREAS
ABB ENVIRONMENTAL SERVICES, INC.

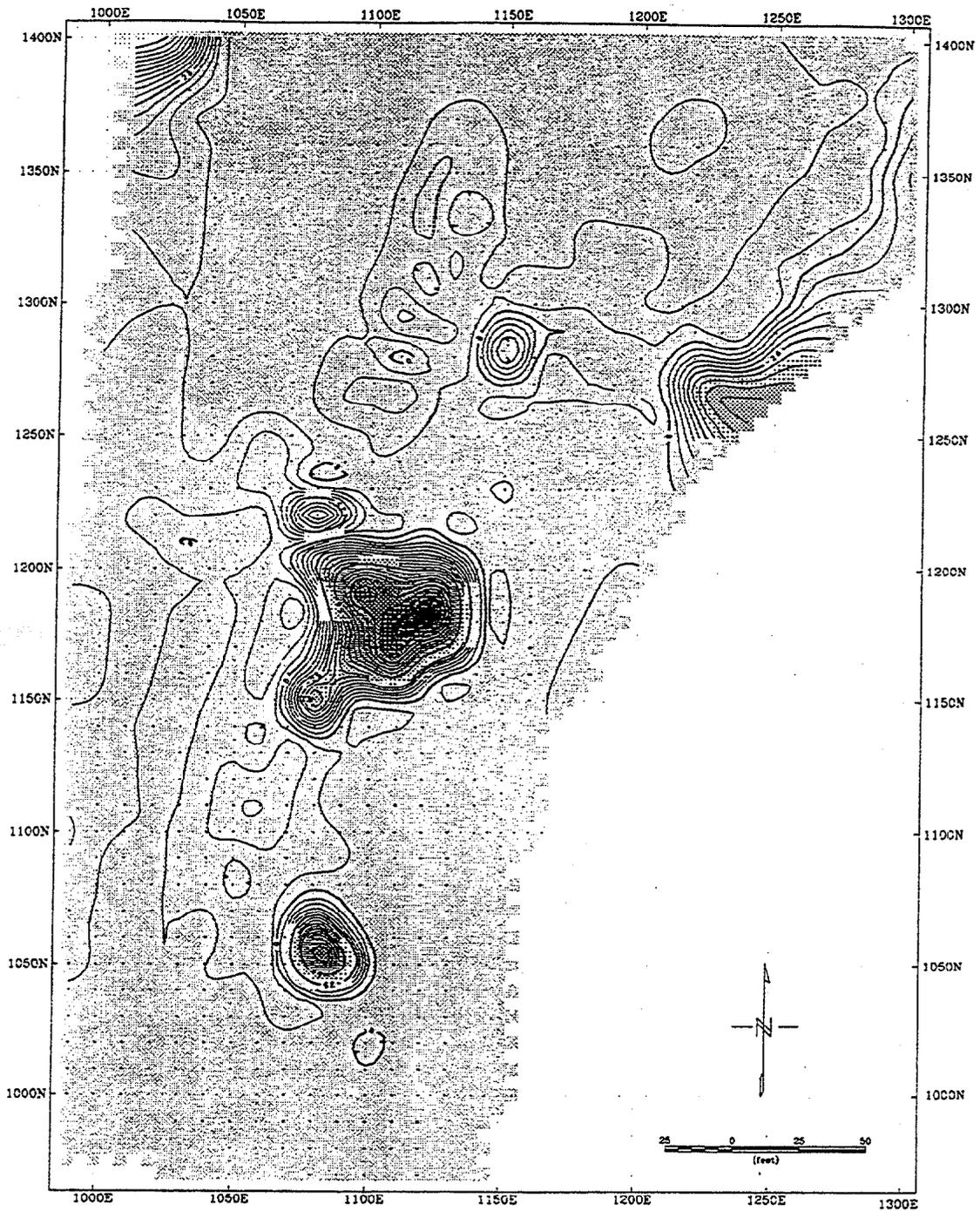


Figure 10

NAVY CLEAN
QUADRATURE CONTOURS
EA 05 - FORMER BOAT RENTAL/MAINTENANCE
SSP - GROUP 1 STUDY AREAS
ABB ENVIRONMENTAL SERVICES, INC.

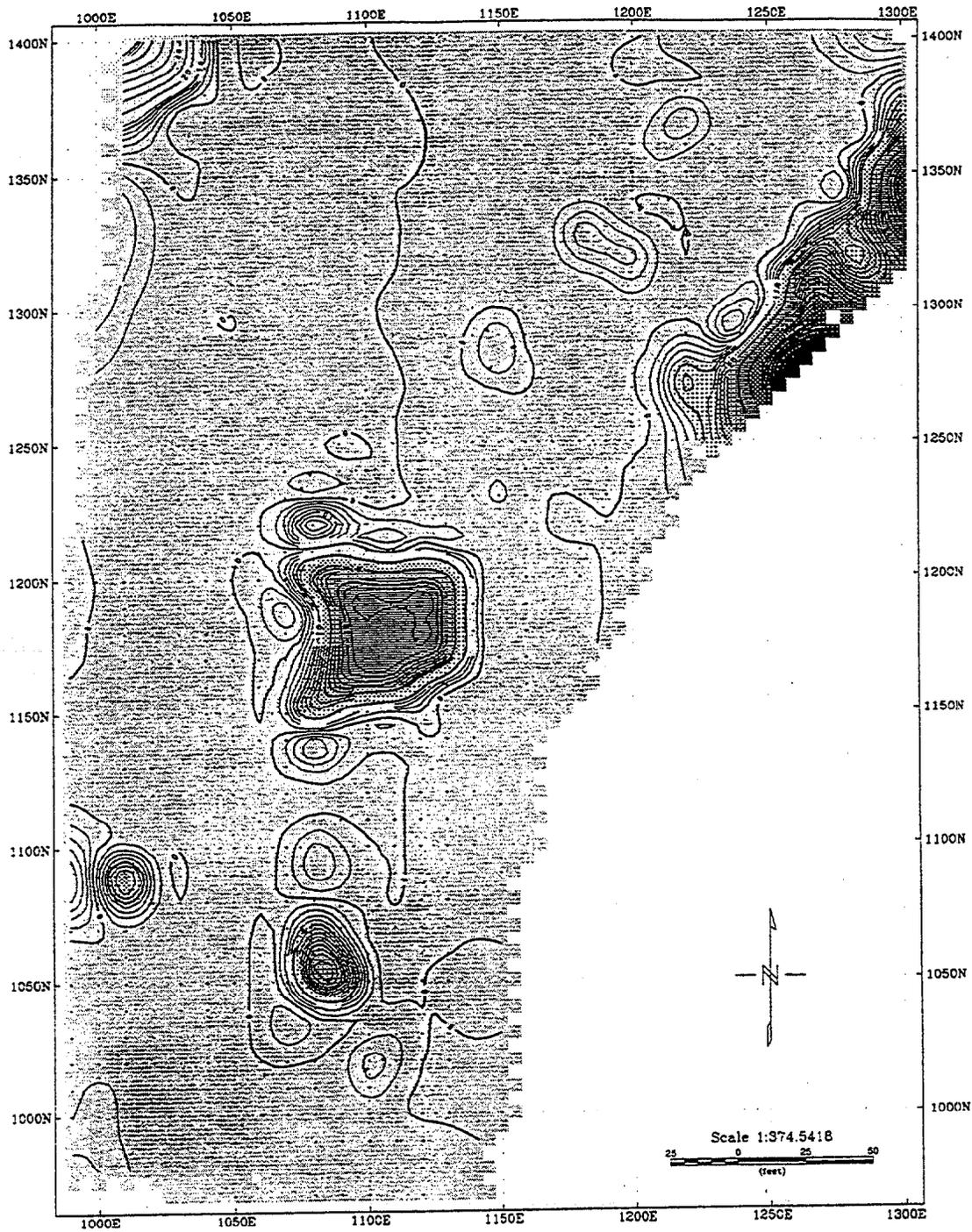


Figure 11

<p>NAVY CLEAN</p> <p>IN PHASE (TC) CONTOURS</p> <p>SA 05 - FORMER BOAT RENTAL/MAINTENANCE</p> <p>SSP - GROUP 1 STUDY AREAS</p> <p>ABB ENVIRONMENTAL SERVICES, INC.</p>

APPENDIX B

SOIL GAS SURVEY FINDINGS

FINAL REPORT ON THE FINDINGS OF
THE PETREX SOIL GAS SURVEYS
STUDY AREA 5
NAVAL TRAINING CENTER (NTC), ORLANDO, FLORIDA

1.0 Executive Summary

The information contained herein has been extracted from the Northeast Research Institute, LLC (NERI) report so that only information pertinent to Study Area 5 at NTC, Orlando is included. The complete report contains detailed information on quality assurance and quality control procedures, thermal desorption-mass spectrometry, and data tables. In addition, only those figures (Plates 9 through 12) relevant to Study Area 5 are included. This document may be obtained from ABB Environmental Services, Inc. (ABB-ES), Orlando, Florida.

Benzene, toluene, and ethylbenzene, and xylene(s) (BTEX), the cycloalkane/alkene petroleum hydrocarbons, and tetrachloroethene (PCE) were detected in soil gas at the study area. The distribution of the compound occurrences were mapped and potential source areas were identified. Relatively high levels for all compounds were detected at Study Area 3, indicating potentially significant chemical occurrences beyond the site of investigation.

2.0 Introduction

In August and September 1994, ABB-ES subcontracted NERI, under Subcontract No. SE4-09-027, to conduct a PETREX passive soil gas survey at NTC, Orlando in Orlando, Florida. The purpose of this survey was to assist in site-screening activities to assess the environmental impact from past site use at Study Area 5. This area was screened for volatile and semivolatile organic compounds (VOCs and SVOCs) that may be present in the soil gas.

Study Area 5, located adjacent to the northern entrance to the NTC Complex on the shore of Lake Baldwin, was occupied from 1962 to 1983 by a motorboat maintenance and rental hut, which utilized a 1,500-gallon septic tank and leach field.

3.0 Objectives

The objectives of this soil gas survey were to

1. collect and report VOCs and SVOCs as constituents of the soil gas;
2. map the areal extent of the reported compounds in order to exhibit areas of potential subsurface contamination; and
3. attempt to determine the extent of potential source areas of the reported compounds in the subsurface.

4.0 Overview of the PETREX Technique

Each PETREX soil gas sampler consists of two or three activated charcoal adsorption elements (collectors) housed in a resealable glass container in an inert atmosphere.

Soil gas sample collection is performed by unsealing the sampler and exposing the collector to the soil gas of the subsurface environment at the base of a shallow borehole. Sample collection proceeds via free vapor diffusion through the opening of the uncapped sampler container. Following a controlled period of time, the sampler is retrieved from the borehole, resealed, and submitted for analysis.

One collector from each soil gas sampler is analyzed by Thermal Desorption/Mass Spectrometry (TD/MS). Selected second collectors may be analyzed by Thermal Desorption-Gas Chromatography/Mass Spectrometry (TD-GC/MS) for compound confirmation. At least 10 percent of samplers used in any project are three collector samplers. The third collector is used for setting instrument sensitivity prior to analysis.

Compounds are identified by comparison to standard reference spectra run on the same instrument. The mass spectral ion count of the appropriate indicator peak(s) for each compound or group of compounds is then plotted as relative response on a map and contoured using a variety of standard geostatistical analyses.

5.0 Scope of Work

A total of 16 PETREX soil gas samplers was utilized for this survey. At a majority of the sampler locations, a 2-inch-diameter by 12-inch deep hole was excavated into the surface soil using a core shovel. After the sampler was lowered into the hole, the hole was backfilled with the soil plug taken from the shovel. Each sampler location was marked with a pin flag and ribbon flagging to help locate it during retrieval.

At the remaining sampler locations, located in asphalt, a 1-3/4-inch-diameter by 18-inch deep hole was excavated through the asphalt into the underlying soil using an electric rotary hammer drill equipped with a carbide-tipped bit. A 2-foot length of 18-gauge galvanized steel wire was attached to the sampler and the sampler was lowered into the borehole. A ball of aluminum foil was packed to within 1 inch of the surface and the last inch was filled with quick-setting cement.

Field procedures for this survey also included decontamination of the borehole equipment between sampler locations to prevent cross-contamination. The methods employed were as follows:

1. equipment (core shovel head and drill bit) was washed thoroughly with laboratory detergent and potable water using a nylon brush to remove particulate matter
2. equipment was rinsed thoroughly with deionized/organic-free water

3. equipment was rinsed with a 10 percent solution of pesticide-grade isopropanol
4. equipment was rinsed again with deionized/organic-free water and air-dried

Retrieval of samplers placed in soil entailed removing the soil plug from the hole and lifting out the sampler, which was then cleaned, sealed and labeled with the sampler location number. Samplers placed beneath asphalt were retrieved by first chipping away the cement patch to expose the retrieval wire, then pulling gently on the wire to lift the sampler out of the borehole. The retrieval wire was removed from the sampler and the sampler was then cleaned, sealed, and labeled.

6.0 Field Activities

Between August 15 and August 19, 1994, two NERI Field Geologists, assisted by ABB-ES personnel, conducted PETREX soil gas sampling onsite. A total of 16 PETREX samplers was placed onsite. The samplers were placed in approximate 50-foot square grids, as shown on Plate 9, Sample Locations Map.

Two sets of time calibration samplers were installed at three established sampling points in the study area. One set of these time calibration samplers was retrieved after 2 days and analyzed to check on the loading rate of VOCs onto the collectors. After reviewing the results from these time calibration samplers, it was determined to retrieve the second set of time calibration samplers after an additional 7 days of exposure in the field. Based on the results of these time calibration samplers, it was decided to retrieve all of the survey samplers after a further 7 days.

After an exposure period of approximately 14 to 16 days, the samplers were retrieved by a NERI Field Geologist between August 31 and September 2, 1994, and returned to NERI's Lakewood, Colorado laboratory for analysis by TD/MS.

7.0 Discussion

The soil gas response levels discussed below are described as elevated and moderate relative to the entire data set. The ion count values that have been reported represent qualitative soil gas values that were evaluated relative to the other sampler locations.

Ion count values are the unit of measure generated by the mass spectrometer to illustrate the relative intensities associated with each of the reported compounds. These response levels do not represent an actual concentration of the reported compounds but are used to differentiate source areas from migration and/or dispersion pathways.

Study Area 5 was occupied from 1962 to 1983 by a motorboat maintenance and rental hut, which utilized a 1,500-gallon septic tank and leach field. Thus, there is a potential that petroleum hydrocarbons from former fuel pumps and solvents from maintenance activities exist in the subsurface at this site. Plate 9 displays the locations of the 16 samplers placed at Study Area 5. Sampler 84, placed

adjacent to a pine tree, adsorbed terpenes, and, therefore, petroleum hydrocarbons could not be reliably reported at this sample location.

7.1 BTEX Relative Response Map

Isolated occurrences of BTEX were detected on the south eastern edge of the survey area, at sample locations 79 and 81. The absence of data between, and adjacent to these samples, makes it difficult to ascertain the significance of these response values. The distribution of BTEX is shown on Plate 10, Appendix C.

7.2 Cycloalkanes/Alkenes Relative Response Map

Elevated response levels of the cycloalkanes/alkenes were also identified in the vicinity of samples 79 and 81, and additionally at sample location 80. These detections, coupled with the BTEX detections at similar locations, may indicate that this area reflects disposal practices. The distribution of the cycloalkanes/alkenes is shown on Plate 11.

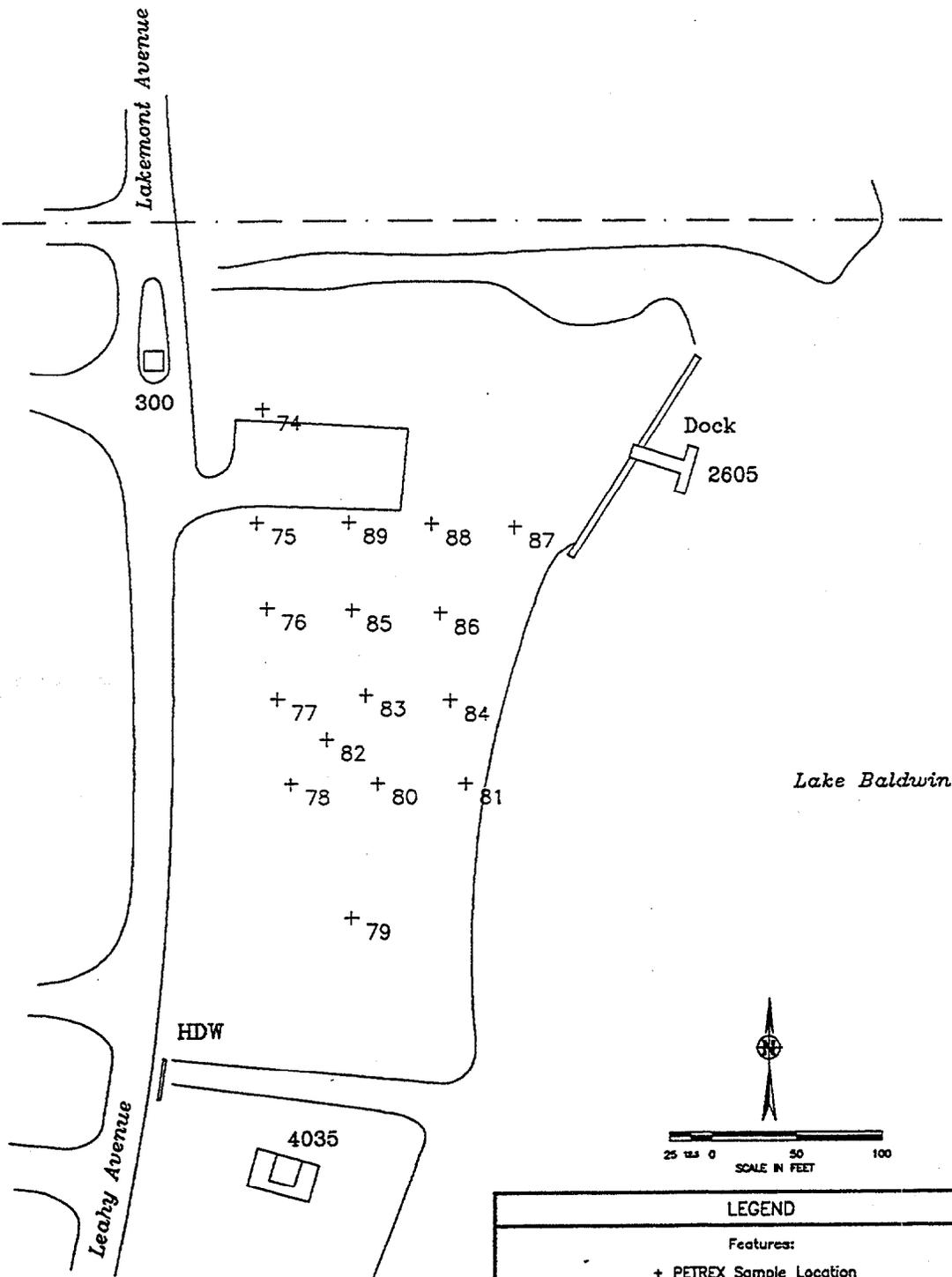
7.3 Tetrachloroethene Relative Response Map

A single detection of PCE was identified at sample location 85.

8.0 Conclusions

BTEX, the cycloalkane/alkene petroleum hydrocarbons, and PCE were detected in soil gas. The distribution of the compound occurrences were mapped, and potential source areas were identified. Low levels and limited occurrences for all compounds were identified at Study Area 5.

Because soil gas emanation rates are site and chemical specific, the environmental significance of the soil gas response values must be determined relative to compound concentrations in subsurface soil and/or groundwater. Changes in soil gas response in orders of magnitude may be used to plan future investigative studies and to aid in characterizing the behavior (migration, attenuation) of the chemicals in the subsurface. The PETREX method is extremely sensitive and often detects compounds in the low part per billion to part per trillion range; therefore, areas depicted as background by the PETREX method generally do not represent environmentally significant contaminant levels in the subsurface.



LEGEND
Features:
+ PETREX Sample Location



Northeast Research Institute LLC
 605 Parfet Street
 Suite 100
 Lakewood, Colorado 80215
 (303) 238-0090

Drawn By:
JCS
 Checked By:
 Project Manager:
CAS

Project #:
2158E
 Date:
October 5, 1994
 File Name:
2158-5_1.dwg

ABB Environmental Services, Inc.
 Naval Training Center UNF-13, Study Area 5
 Orlando, Florida


Sample Locations

Plate 9

Lakemont Avenue

Leahy Avenue

300

+ ND

Dock

2605

+ 521 + 1855 + 1985 + 1996

+ ND + 10945 + 15350

+ 2125 + ND + T
+ 3970

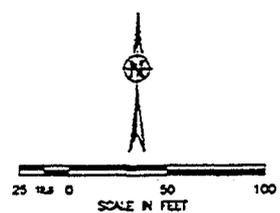
+ 5002 + 16520 + 174756

Lake Baldwin

51857

HDW

4035



LEGEND	
Relative Response Values: ■ ≥ 50,000	Features: + PETREX Sample Location T Samples affected by terpenes. See text for explanation.

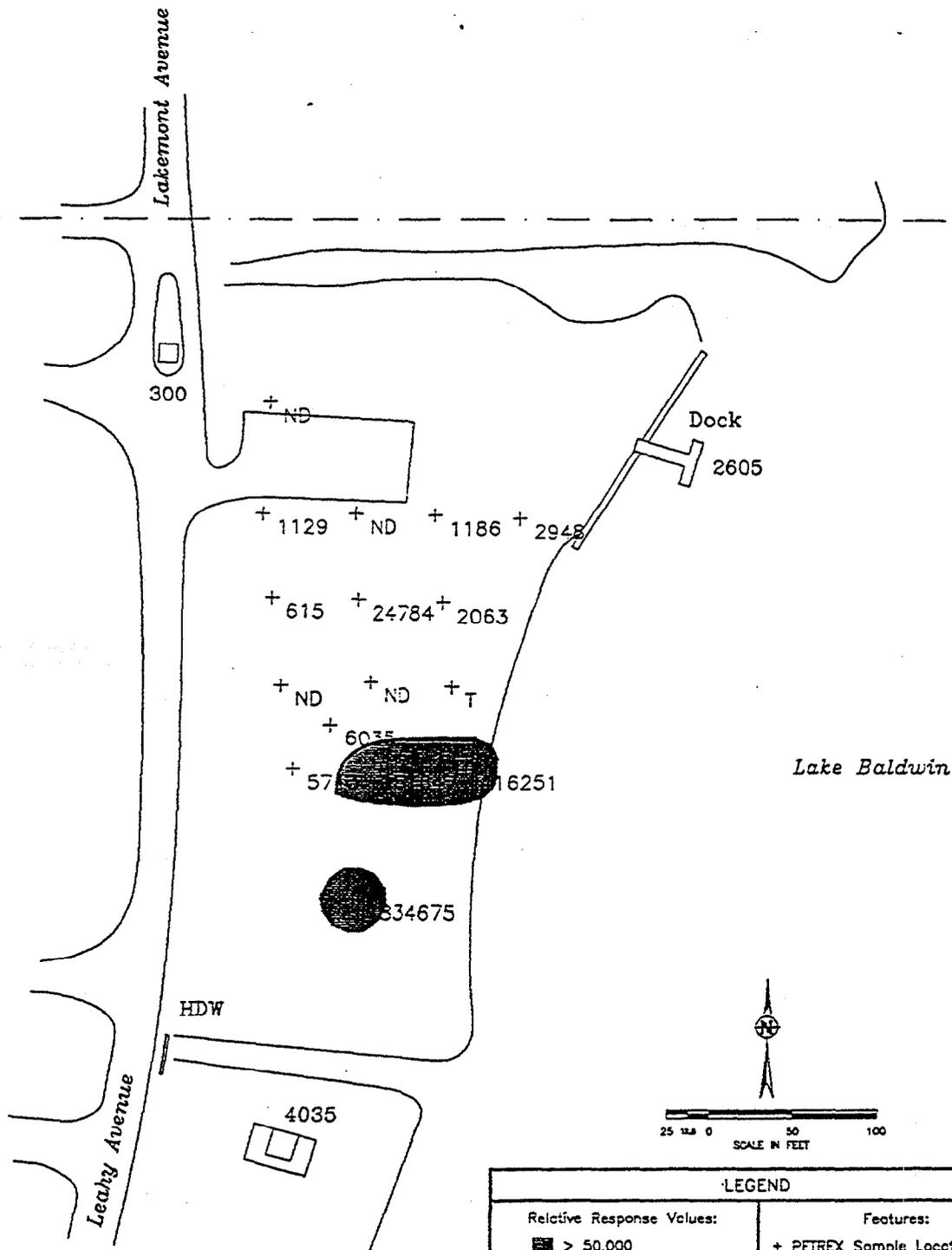
NERI
Northeast Research Institute LLC
605 Parfet Street
Suite 100
Lakewood, Colorado 80215
(303) 238-0990

Drawn By: JCS	Project #: 2158E
Checked By:	Date: October 5, 1994
Project Manager: CAS	File Name: 2158-5_2.dwg

ABB Environmental Services, Inc.
Naval Training Center UNF-13, Study Area 5
Orlando, Florida

Relative Response
Benzene, Toluene,
Ethylbenzene, Xylene(s)

Plate 10



LEGEND	
Relative Response Values: ■ ≥ 50,000	Features: + PETREX Sample Location T Samples affected by terpenes. See text for explanation.

NERI
 Northwest Research Institute LLC
 605 Parfet Street
 Suite 100
 Lakewood, Colorado 80215
 (303) 238-0090

Drawn By: JCS	Project #: 2158E
Checked By:	Date: October 5, 1994
Project Manager: CAS	File Name: 2158-S_3.dwg

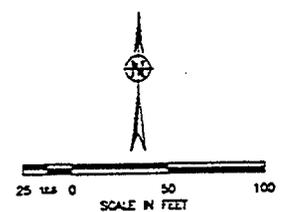
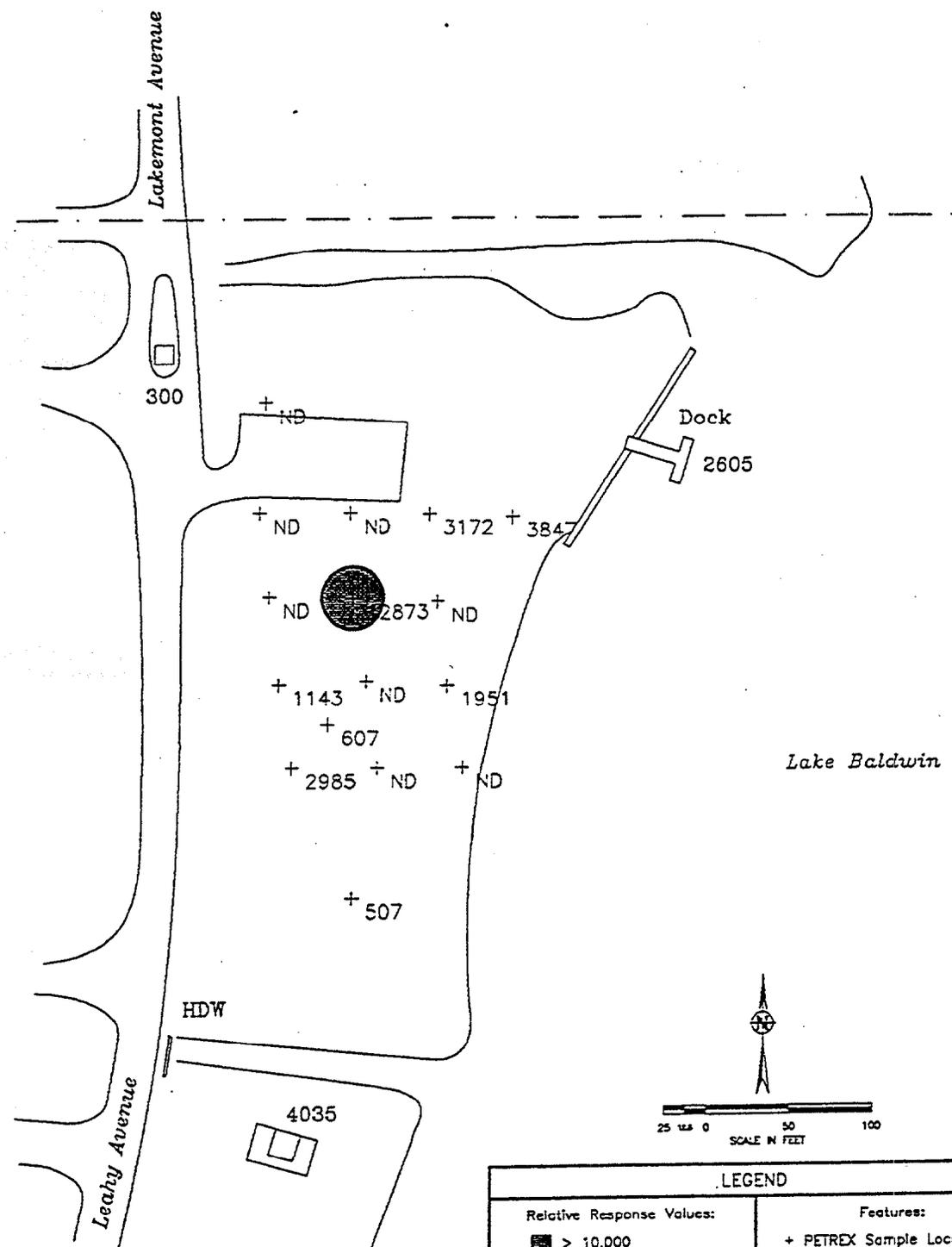
ABB Environmental Services, Inc.
 Naval Training Center UNF-13, Study Area 5
 Orlando, Florida

Relative Response
 Cycloalkanes/Alkenes

Plate 11

Lakemont Avenue

Leahy Avenue



LEGEND	
Relative Response Values: ■ ≥ 10,000	Features: + PETREX Sample Location

NERI
Northeast Research Institute LLC
605 Parlet Street
Suite 100
Lakewood, Colorado 80215
(303) 238-0090

Drawn By: JCS	Project #: 2158E
Checked By:	Date: October 5, 1994
Project Manager: CAS	File Name: 2158-5_4.dwg

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Naval Training Center UNF-13, Study Area 5
Orlando, Florida

Relative Response
Tetrachloroethene

Plate 12

APPENDIX C

SOIL BORING LOGS AND GROUNDWATER MONITORING WELL DIAGRAMS

Project: BRAC NTC, Orlando, Group I, Site Screening		Well ID: OLD-05-01	Boring ID: 05B001
Client: SOUTHNAVFACENGCOM		Contractor: Groundwater Protection, Inc.	Job No.: CTO-107
Northing: 1541785.90	Easting: 551119.57	Date started: 10/20/94	Compltd: 10/20/94
Method: 8.25" Hollow stem auger	Casing dia.: 2 in.	Screened Int.: 3-13 ft. bls	Protection level: 0
TOC elev.: 84.51 Ft.	Type of OVM: Porta FID	Total dpth: 14.0Ft.	Dpth to ∇: 4.0* Ft.
ABB Rep.: S. Grietens	Well development date: 11/03/94		Site: Study Area 05

Depth Ft.	Laboratory Sample ID.	Sample Recovery	Headspace (ppm)	Soil/Rock Description and comments	Lithologic symbol	Soil class.	Blows/6-in.	Well diag.
			0	QUARTZ SAND: Brown/black, silty sands, well sorted good to moderate rounding with some organics.	[Dotted pattern]	SP	posthole	[Well diagram]
	05B00101		0				posthole	
			22				9,12,8,8	
5		80%	0				1,1,2,3	
		80%	50				1,4,8,8	
		85%	0				2,4,8,8	
10			0					
		95%	0					
			0	QUARTZ SAND: Rust/red/brown, same as .5 to 12.5 feet with trace phosphates.			1,9,29,29	
		100%						
15								

Project: BRAC NTC, Orlando, Group I, Site Screening		Well ID: OLD-05-02	Boring ID: 05B002
Client: SOUTHNAVFACENCOM		Contractor: Groundwater Protection, Inc.	Job No.: CTO-107
Northing: 1541851.33	Eastng: 551154.31	Date started: 10/20/94	Compltd: 10/20/94
Method: 6.25" Hollow stem auger	Casing dia.: 2 in.	Screened Int.: 3-13 ft. bis	Protection level: D
TOC elev.: 84.11 Ft.	Type of OVM: Porta FID	Total dpth: 14.0Ft.	Dpth to ∇ 2.0* Ft.
ABB Rep.: S. Grietens	Well development date: 11/03/94		Site: Study Area 05

Depth Ft.	Laboratory Sample ID.	Sample Recovery	Headspace (ppm)	Soil/Rock Description and comments	Lithologic symbol	Soil class.	Blows/6-in.	Well diag.
	05B00201		0	QUARTZ SAND: Brown/black, silty sands, well sorted good to moderate rounding, organic rich.	[Dotted pattern]	SP	posthole	[Well diagram]
			0	QUARTZ SAND: Tan/brown, same as .5 to 1 feet, with trace organics.				
5		95%	10	QUARTZ SAND: Brown/black, same as .5 to 4 feet, with a swampy matrix.				
		95%	15	QUARTZ SAND: Rust/red, same as .5 to 4 feet.				
		90%	0	QUARTZ SAND: Same as as .5 to 4 feet, less silty, with trace phophates.				
10		95%	0					
		95%	0				5,5,8,8	
			0				3,7,10,14	

Project: BRAC NTC, Orlando, Group I, Site Screening		Well ID: OLD-05-03	Boring ID: 05B003
Client: SOUTHNAVFACENGCOM		Contractor: Groundwater Protection, Inc.	Job No.: CT0-107
Northing: 1541800.73	Easting: 551126.45	Date started: 10/19/94	Compltd: 10/19/94
Method: 6.25" Hollow stem auger	Casing dia.: 2 in.	Screened Int.: 3-13 ft. b/s	Protection level: D
TOC elev.: 94.03 Ft.	Type of OVM.: Porta FID	Total dpth: 14.0Ft.	Dpth to ∇ 3.0* Ft.
ABB Rep.: S. Grietens	Well development date: 11/03/94		Site: Study Area 05

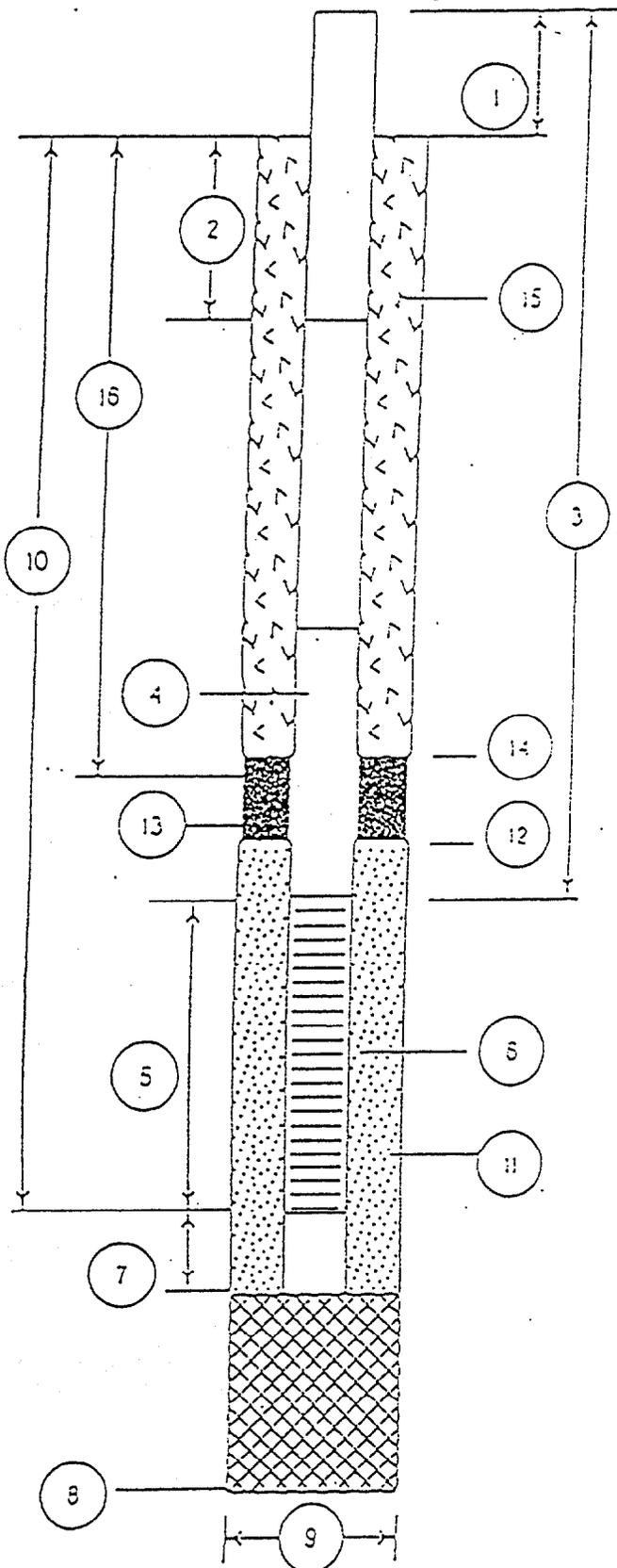
Depth Ft.	Laboratory Sample ID.	Sample Recovery	Headspace (ppm)	Soil/Rock Description and comments	Lithologic symbol	Soil class.	Blows/6-in.	Well diag.
			0	QUARTZ SAND: Brown/black, silty sands, well sorted, good to moderate rounding, organic rich.	[Dotted pattern]	SP	posthole	[Well diagram]
	05B00301		0				posthole	
			0				1,1,1,2	
5		80%	0	QUARTZ SAND: Same as .5 to 8 feet, with trace organics.			1,1,3,10	
		80%	0				3,4,8,7	
			0	QUARTZ SAND: Rust/red, coarse/fine grained, same as 8 to 9 feet, with trace phosphates.			1,3,5,7	
10		90%	0				4,5,9,12	
		95%	0					
		100%	0					
15								

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

WELL CONSTRUCTION DETAIL

WELL NUMBER: OLD-05-01

DATE OF INSTALLATION: 10/20/94



1. Height of Casing above ground: 0

2. Depth to first Coupling: 3'

Coupling Interval Depths: 10'

3. Total Length of Riser Pipe: 3'

4. Type of Riser Pipe: 2" Ø Schedule 40 PVC

5. Length of Screen: 10'

6. Type of Screen: 2" Ø schedule 40 PVC .010 Slot Screen

7. Length of Sump: 6"

8. Total Depth of Boring: 14'

9. Diameter of Boring: 6.25"

10. Depth to Bottom of Screen: 12.5'

11. Type of Screen Filter: 20/30 Silica Sand

Quantity Used: 550 lb Size: _____

12. Depth to Top of Filter: 2'

13. Type of Seal: Bentonite

Quantity Used: 25 lb

14. Depth to Top of Seal: 1.5'

15. Type of Grout: Portland Cement

Grout Mixture:

Method of Placement: POURED

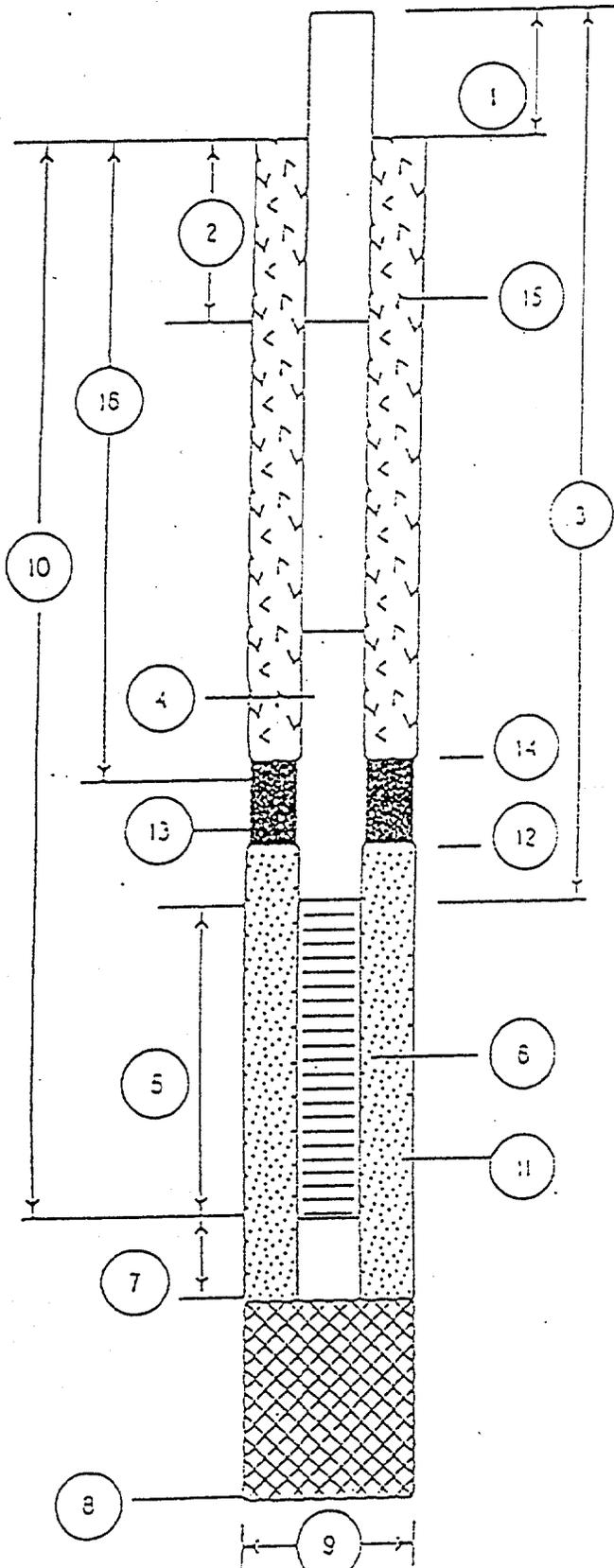
18. Tot. Depth of 6 in. Steel Casing: N/A

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

WELL CONSTRUCTION DETAIL

WELL NUMBER: OLD-05-02

DATE OF INSTALLATION: 10/20/94



1. Height of Casing above ground: 0
2. Depth to first Coupling: 3'
Coupling Interval Depths: 10'
3. Total Length of Riser Pipe: 3'
4. Type of Riser Pipe: 2" ϕ Schedule 40 PVC
5. Length of Screen: 10'
6. Type of Screen: 2" ϕ Schedule 40 PVC .010 Slot Screen
7. Length of Sump: 6"
8. Total Depth of Boring: 14'
9. Diameter of Boring: 6.25"
10. Depth to Bottom of Screen: 12.5'
11. Type of Screen Filter: 20/30 Silica Sand
Quantity Used: 500 lb Size: _____
12. Depth to Top of Filter: 2'
13. Type of Seal: Bentonite
Quantity Used: 25 lb
14. Depth to Top of Seal: 1.5'
15. Type of GROUT: Portland Cement
GROUT MIXTURE:
Method of Placement: POURED
16. Tot. Depth of 8 in. Steel Casing: N/A

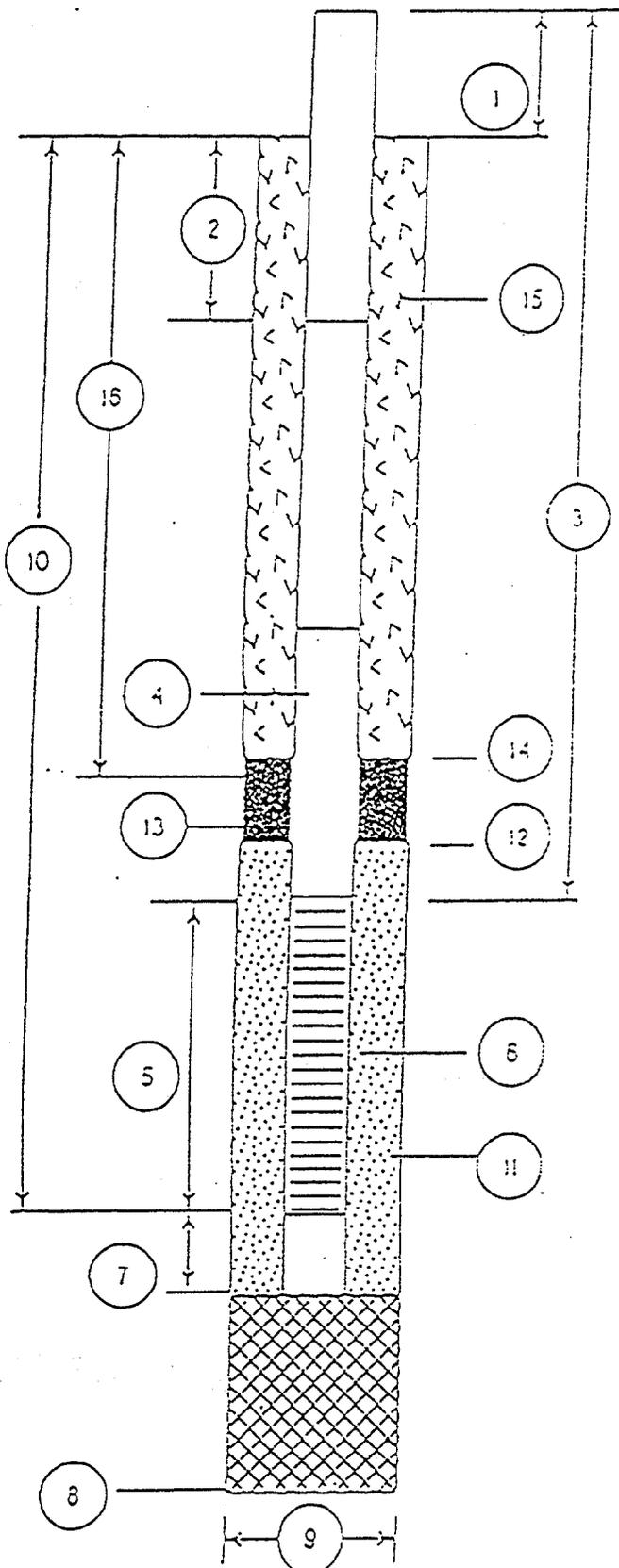
DEPARTMENT OF THE NAVY

SOUTHERN DIVISION
 NAVAL FACILITIES ENGINEERING COMMAND
 CHARLESTON, SC.

WELL CONSTRUCTION DETAIL

WELL NUMBER: OLD-05-03

DATE OF INSTALLATION: 10/19/94



1. Height of Casing above ground: 0
2. Depth to first Coupling: 3'
Coupling Interval Depths: 10'
3. Total Length of Riser Pipe: 3'
4. Type of Riser Pipe: 2" Ø Schedule 40 PVC
5. Length of Screen: 10'
6. Type of Screen: 2" Ø schedule 40 PVC .010 Slot Screen
7. Length of Sump: 6"
8. Total Depth of Boring: 14'
9. Diameter of Boring: 6.25"
10. Depth to Bottom of Screen: 12.5'
11. Type of Screen Filter: 20/30 Silica Sand
Quantity Used: 550 lb Size:
12. Depth to Top of Filter: 2'
13. Type of Seal: Bentonite
Quantity Used: 25 lb
14. Depth to Top of Seal: 1.5'
15. Type of Grout: Portland Cement
Grout Mixture:
Method of Placement: POURED
16. Tot. Depth of 5 in. Steel Casing: N/A

APPENDIX D

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

Table D-1
Summary of Detections in Subsurface Soil Analytical Results, Study Area 5

BRAC Environmental Site-Screening Report
Naval Training Center
Orlando, Florida

Identifier: Sampling Date Feet bls	Background Screening ¹	RBC ² for Residential Soil	RBC ² for Industrial Soil	05B00101 20-Oct-94 2	05B00201 20-Oct-94 2	05B00301 19-Oct-94 2
Semivolatile Organic Compounds (µg/kg)						
Di-n-butylphthalate	560	7,800,000 n	200,000,000 n	--	--	4,100
Pesticides/PCBs (µg/kg)						
4,4'-DDD	--	2,700 c	24,000 c	8.3 J	--	--
4,4'-DDE	130	1,900 c	17,000 c	20 J	10	--
4,4'-DDT	87	1,900 c	17,000 c	5.6 J	3.5 J	--
alpha-Chlordane	43	490 c	4,400 c	8 J	--	24
gamma-Chlordane	43	490 c	4,400 c	6.2 J	--	13 J
Heptachlor epoxide	--	70 c	630 c	2.2 J	--	--
Inorganic Analytes (mg/kg)						
Aluminum	2,119	78,000 n	1,000,000 n	2,300	1,080	19,100
Arsenic	1.1	0.43 g/23 n	3.8 g/610 n	0.88 B/3.5 B		
Barium	3.6	5,500 n	140,000 n	24.4 J	4.7 J	16.5 J
Calcium	115	1,000,000	1,000,000	1,300	101 B	732 B
Chromium	3.7	390 n	10,000 n	2.8	1.1 B	--
Copper	--	3,100 n	82,000 n	0.86 B	--	--
Iron	264	23,000 n	610,000 n	186	164	538 B
Lead	3.9	400	400	7.1	3.3	20.4
Magnesium	32.8	460,468	460,468	47.2 J	29.6 J	--
Manganese	2.1	1,800 n	47,000 n	1.7 B	0.74 B	--
Mercury	--	23 n	610 n	--	--	0.16 B
Selenium	1.3	390 n	10,000 n	--	--	2.2 J
Vanadium	3.4	550 n	14,000 n	1.4 B	--	--
Zinc	5.6	23,000 n	610,000 n	10.5	--	--

See notes on following page.

Table D-1 (Continued)
Summary of Detections in Subsurface Soil Analytical Results, Study Area 5

BRAC Environmental Site-Screening Report
Naval Training Center
Orlando, Florida

¹ Background values are for subsols. The background screening value is twice the average of detected concentrations for inorganic analytes. For organic compounds, values are the mean of detected concentration, presented for comparison purposes only.

² RBC = Risk-Based Concentration Table, U.S. Environmental Protection Agency 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 (Office of Solid Waste and Emergency Response directive 9355-4-12). For essential nutrients (calcium, magnesium, potassium, and sodium) screening values were derived based on recommended daily allowances.

Notes: BRAC = Base Realignment and Closure.

bls = below land surface.

$\mu\text{g}/\text{kg}$ = micrograms per kilogram.

n = noncarcinogenic effects.

-- = analyte/compound was not detected at reporting limit.

PCBs = polychlorinated biphenyls.

c = carcinogenic effects.

J = reported concentration is an estimated quantity.

DDD = dichlorodiphenyldichloroethane.

DDE = dichlorodiphenyldichloroethene.

DDT = dichlorodiphenyltrichloroethane.

mg/kg = milligrams per kilogram.

B = reported concentration is between the instrument detection limit and contract-required detection limit.

 = bolded/shaded value indicate exceedance of regulatory guidance and background.

Table D-2
Summary of Detections in Groundwater Analytical Results, Study Area 5

BRAC Environmental Site-Screening Report
Naval Training Center
Orlando, Florida

Well ID: Identifier: Sampling Date	Background ¹	FDEPG	FEDMCL	Surface Water Standards ²	RBC ³ for Tap Water	OLD-05-01 05G00101 11-Nov-94	OLD-05-02 05G00201 10-Nov-94	OLD-05-03 05G00301 10-Nov-94	OLD-05-03 05G00301D 10-Nov-94
Inorganic Analytes (µg/l)									
Aluminum	4,067	200 ⁴	ND	87 (2,3)	37,000 n	264	194 B	269	263
Barium	31.4	2,000 ⁶	2,000	ND	2,600 n	9.3 B	7.2 B	10.7 B	10 B
Calcium	36,830	ND	ND	ND	1,000,000	20,100	2,400 B	1,600 B	1,560 B
Copper	5.4	1,000 ⁴	ND	6.7 (1,2,3)	1,500 n	--	--	--	4.9 B
Iron	1,227	300 ⁴	ND	1,000 (1,2,3)	11,000 n	467	463	482	463
Lead	4.0	15 ⁶	15	14 (1,2,3)	15	1.7 B	1.3 B	--	--
Magnesium	4,560	ND	ND	ND	118,807	2,630 B	992 B	1,770 B	1,720 B
Manganese	17.0	50 ⁴	ND	ND	840 n	8.7 B	2.3 B	2.6 B	2.4 B
Potassium	5,400	ND	ND	ND	297,016	4,850 B	1,320 B	1,480 B	1,410 B
Sodium	18,222	160,000 ⁶	ND	ND	396,022	5,620	6,720	7,540	7,240
Vanadium	20.6	49 ⁵	ND	ND	260 n	4.4 B	--	--	3.2 B
Zinc	4.0	5,000 ⁴	ND	60 (1,2,3)	11,000 n	3 B	3.9 B	2 B	3.5 B
See notes on following page.									

Table D-2 (Continued)

Summary of Detections in Groundwater Analytical Results, Study Area 5

BRAC Environmental Site-Screening Report
Naval Training Center
Orlando, Florida

¹ Groundwater background screening value is twice the average of detected concentrations for inorganic analytes. For organic compounds, values are the mean of detected concentration, presented for comparison purposes only.

² Screening value is the lowest of: (1) Florida Department of Environmental Protection Class III Surface Water Standards, (2) U.S. Environmental Protection Agency (USEPA) Chronic Ambient Water Quality Criteria, (3) Region IV Chronic Freshwater Quality Screening Value. Hardness dependent criteria (copper, lead, and zinc) were calculated using the an average water hardness for Lake Baldwin of 51 milligrams per liter calcium carbonate. The water hardness was determined during the site-screening activities at Lake Baldwin, Study Area 6.

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 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.

⁴ Secondary standard.

⁵ Systemic toxicant.

⁶ Primary standard.

Notes: BRAC = Base Realignment and Closure.

ID = identification.

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

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

$\mu\text{g}/\text{l}$ = micrograms per liter.

ND = not determined.

n = noncarcinogenic effects.

B = reported concentration is between the instrument detection limit and the contract-required detection limit.

-- = analyte/compound was not detected at reporting limit.

 = bold/shaded numbers indicate exceedance of surface water standards.

APPENDIX E

SUMMARY OF ANALYTICAL RESULTS

Table E-1
Summary of Soil Analytical Results
Target Compound List Volatile Organics
Study Area 5

BRAC Environmental Site-Screening Report
 Naval Training Center
 Orlando, Florida

Identifier	Sampling Date	05B00101		05B00201		05B00301	
		10/20/94		10/20/94		10/19/94	
1,1,1-Trichloroethane		12	U	12	U	45	U
1,1,2,2-Tetrachloroethane		12	U	12	U	45	U
1,1,2-Trichloroethane		12	U	12	U	45	U
1,1-Dichloroethane		12	U	12	U	45	U
1,1-Dichloroethene		12	U	12	U	45	U
1,2-Dichloroethane		12	U	12	U	45	U
1,2-Dichloroethene (total)		12	U	12	U	45	U
1,2-Dichloropropane		12	U	12	U	45	U
2-Butanone		12	U	12	U	45	U
2-Hexanone		12	U	12	U	45	U
4-Methyl-2-pentanone		12	U	12	U	45	U
Acetone		14	UJ	30	UJ	54	UJ
Benzene		12	U	12	U	45	U
Bromodichloromethane		12	U	12	U	45	U
Bromoform		12	U	12	U	45	U
Bromomethane		12	U	12	U	45	U
Carbon disulfide		12	U	12	U	45	U
Carbon tetrachloride		12	U	12	U	45	U
Chlorobenzene		12	U	12	U	45	U
Chloroethane		12	U	12	U	45	U
Chloroform		12	U	12	U	45	U
Chloromethane		12	U	12	U	45	U
cis-1,3-Dichloropropene		12	U	12	U	45	U
Dibromochloromethane		12	U	12	U	45	U
Ethylbenzene		12	U	12	U	45	U
Methylene chloride		12	UJ	12	UJ	45	U
Styrene		12	U	12	U	45	U
Tetrachloroethene		12	U	12	U	45	U
Toluene		12	U	12	U	45	U
trans-1,3-Dichloropropene		12	U	12	U	45	U
Trichloroethene		12	U	12	U	45	U
Vinyl chloride		12	U	12	U	45	U
Xylene (total)		12	U	12	U	45	U

Notes: Analytical results expressed in micrograms per kilogram ($\mu\text{g}/\text{kg}$) soil dry weight.

U = Compound not detected at the contract-required quantitation limit (CRQL).

J = Reported concentration is an estimated quantity.

**Table E-2
Summary of Soil Analytical Results
Target Compound List Semivolatile Organics
Study Area 5**

BRAC Environmental Site-Screening Report
Naval Training Center
Orlando, Florida

Identifier	05B00101		05B00201		05B00301	
	Sampling Date	10/20/94	10/20/94	10/20/94	10/19/94	10/19/94
1,2,4-Trichlorobenzene		420 U		390 U		1600 U
1,2-Dichlorobenzene		420 U		390 U		1600 U
1,3-Dichlorobenzene		420 U		390 U		1600 U
1,4-Dichlorobenzene		420 U		390 U		1600 U
2,2'-oxybis(1-Chloropropane)		420 U		390 U		1600 UJ
2,4,5-Trichlorophenol		1000 U		980 U		4000 U
2,4,6-Trichlorophenol		420 U		390 U		1600 U
2,4-Dichlorophenol		420 U		390 U		1600 U
2,4-Dimethylphenol		420 U		390 U		1600 U
2,4-Dinitrophenol		1000 U		980 U		4000 U
2,4-Dinitrotoluene		420 U		390 U		1600 U
2,6-Dinitrotoluene		420 U		390 U		1600 U
2-Chloronaphthalene		420 U		390 U		1600 U
2-Chlorophenol		420 U		390 U		1600 U
2-Methylnaphthalene		420 U		390 U		1600 U
2-Methylphenol		420 U		390 U		1600 U
2-Nitroaniline		1000 U		980 U		4000 U
2-Nitrophenol		420 U		390 U		1600 U
3,3'-Dichlorobenzidine		420 U		390 U		1600 U
3-Nitroaniline		1000 U		980 U		4000 U
4,6-Dinitro-2-methylphenol		1000 U		980 U		4000 U
4-Bromophenyl-phenylether		420 U		390 U		1600 U
4-Chloro-3-methylphenol		420 U		390 U		1600 U
4-Chloroaniline		420 U		390 U		1600 U
4-Chlorophenyl-phenylether		420 U		390 U		1600 U
4-Methylphenol		420 U		390 U		1600 U
4-Nitroaniline		1000 U		980 U		4000 U
4-Nitrophenol		1000 U		980 U		4000 U
Acenaphthene		420 U		390 U		1600 U
Acenaphthylene		420 U		390 U		1600 U
Anthracene		420 U		390 U		1600 U
Benzo(a)anthracene		420 U		390 U		1600 U
Benzo(a)pyrene		420 U		390 U		1600 U
Benzo(b)fluoranthene		420 U		390 U		1600 U
Benzo(g,h,i)perylene		420 U		390 U		1600 U
Benzo(k)fluoranthene		420 U		390 U		1600 U

See notes at end of table.

**Table E-2 (Continued)
Summary of Soil Analytical Results
Target Compound List Semivolatile Organics
Study Area 5**

BRAC Environmental Site-Screening Report
Naval Training Center
Orlando, Florida

Identifier	05B00101		05B00201		05B00301	
	Sampling Date	10/20/94	10/20/94	10/20/94	10/19/94	10/19/94
bis(2-Chloroethoxy)methane	420	U	390	U	1600	U
bis(2-Chloroethyl)ether	420	U	390	U	1600	U
bis(2-Ethylhexyl)phthalate	420	U	390	U	1600	U
Butylbenzylphthalate	420	U	390	U	1600	U
Carbazole	420	U	390	U	1600	U
Chrysene	420	U	390	U	1600	U
Di-n-butylphthalate	440	U	490	U	4100	
Di-n-octylphthalate	420	U	390	U	1600	U
Dibenz(a,h)anthracene	420	U	390	U	1600	U
Dibenzofuran	420	U	390	U	1600	U
Diethylphthalate	420	U	390	U	1600	U
Dimethylphthalate	420	U	390	U	1600	U
Fluoranthene	420	U	390	U	1600	U
Fluorene	420	U	390	U	1600	U
Hexachlorobenzene	420	U	390	U	1600	U
Hexachlorobutadiene	420	U	390	U	1600	U
Hexachlorocyclopentadiene	420	U	390	U	1600	U
Hexachloroethane	420	U	390	U	1600	U
Indeno(1,2,3-cd)pyrene	420	U	390	U	1600	U
Isophorone	420	U	390	U	1600	U
N-Nitroso-di-n-propylamine	420	U	390	U	1600	U
N-Nitrosodiphenylamine ¹	420	U	390	U	1600	U
Naphthalene	420	U	390	U	1600	U
Nitrobenzene	420	U	390	U	1600	U
Pentachlorophenol	1000	U	980	U	4000	U
Phenanthrene	420	U	390	U	1600	U
Phenol	420	U	390	U	1600	U
Pyrene	420	U	390	U	1600	U

Notes: Analytical results expressed in micrograms per kilogram ($\mu\text{g}/\text{kg}$) soil dry weight.

U = Compound not detected at the contract-required quantitation limit (CRQL).
J = Reported concentration is an estimated quantity.

**Table E-3
Summary of Soil Analytical Results
Target Compound List Pesticides/PCBs
Study Area 5**

BRAC Environmental Site-Screening Report
Naval Training Center
Orlando, Florida

Identifier	05B00101		05B00201		05B00301	
	Sampling Date	10/20/94	10/20/94	10/20/94	10/19/94	10/19/94
4,4'-DDD		8.3 J		3.8 U		16 U
4,4'-DDE		20		10		16 U
4,4'-DDT		5.6		3.5 J		16 U
Aldrin		2.1 UJ		2 U		8.1 U
alpha-BHC		2.1 UJ		2 U		8.1 U
alpha-Chlordane		8 J		2 U		24
Aroclor-1016		41 UJ		38 U		160 U
Aroclor-1221		84 UJ		78 U		320 U
Aroclor-1232		41 UJ		38 U		160 U
Aroclor-1242		41 UJ		38 U		160 U
Aroclor-1248		41 UJ		38 U		160 U
Aroclor-1254		41 UJ		38 U		160 U
Aroclor-1260		41 UJ		38 U		160 U
beta-BHC		2.1 UJ		2 U		8.1 U
delta-BHC		2.1 UJ		2 U		8.1 U
Dieldrin		4.1 UJ		3.8 U		16 U
Endosulfan I		2.1 UJ		2 U		8.1 U
Endosulfan II		4.1 UJ		3.8 U		16 U
Endosulfan sulfate		4.1 UJ		3.8 U		16 U
Endrin		4.1 UJ		3.8 U		16 U
Endrin aldehyde		4.1 UJ		3.8 U		16 U
Endrin ketone		4.1 UJ		3.8 U		16 U
gamma-BHC (Lindane)		2.1 UJ		2 U		8.1 U
gamma-Chlordane		6.2 J		2 U		13 J
Heptachlor		2.1 UJ		2 U		8.1 U
Heptachlor epoxide		2.2 J		2 U		8.1 U
Methoxychlor		21 UJ		20 U		81 U
Toxaphene		210 UJ		200 U		810 U

Notes: Analytical results expressed in micrograms per kilogram ($\mu\text{g}/\text{kg}$) soil dry weight.

U = Compound not detected at the contract-required quantitation limit (CRQL).

J = Reported concentration is an estimated quantity.

**Table E-4
Summary of Soil Analytical Results
Target Analyte List Metals
Study Area 5**

BRAC Environmental Site-Screening Report
Naval Training Center
Orlando, Florida

Identifier	05B00101	05B00201	05B00301
Sampling Date	10/20/94	10/20/94	10/19/94
Aluminum	2300	1080	19100
Antimony	4.9 U	4.5 U	348 U
Arsenic	0.88 B	0.44 U	3.5 B
Barium	24.4 J	4.7 J	16.5 J
Beryllium	0.05 U	0.05 U	3.7 U
Cadmium	0.73 U	0.68 U	52.4 U
Calcium	1300	101 B	732 B
Chromium	2.8	1.1 B	33 U
Cobalt	0.75 U	0.7 U	53.8 U
Copper	0.86 B	0.4 U	31 U
Iron	186	164	538 B
Lead	7.1	3.3	20.4
Magnesium	47.2 J	29.6 J	331 UJ
Manganese	1.7 B	0.74 B	9.4 U
Mercury	0.05 U	0.02 U	0.16 B
Nickel	2.3 U	2.1 U	166 U
Potassium	75.5 U	70.3 U	5410 U
Selenium	0.49 U	0.46 UJ	2.2 J
Silver	0.65 U	0.6 U	46.5 U
Sodium	6.6 U	3.7 U	281 U
Thallium	0.33 U	0.3 U	1.2 U
Vanadium	1.4 B	0.62 U	47.7 U
Zinc	10.5	0.31 U	24.1 U

Notes: Analytical results expressed in milligrams per kilogram (mg/kg) soil dry weight.

U = Analyte not detected at the reporting limit.

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

J = Reported concentration is an estimated quantity.

**Table E-5
Summary of Groundwater Analytical Results
Low Detection Limits Volatile Organics
Study Area 5**

BRAC Environmental Site-Screening Report
Naval Training Center
Orlando, Florida

Identifier	05G00101	05G00201	05G00301	05G00301D
Sampling Date	11-Nov-94	10-Nov-94	10-Nov-94	10-Nov-94
1,1,1-Trichloroethane	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1 U	1 U	1 U	1 U
1,1-Dichloroethane	1 U	1 U	1 U	1 U
1,1-Dichloroethene	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	1 U	1 U	1 U	1 U
1,2-Dibromoethane	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	1 U	1 U	1 U	1 U
1,2-Dichloroethane	1 U	1 U	1 U	1 U
1,2-Dichloropropane	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	1 U	1 U	1 U	1 U
2-Butanone	R	R	R	R
2-Hexanone	R	R	R	R
4-Methyl-2-pentanone	5 U	5 U	5 U	5 U
Acetone	R	R	R	R
Benzene	1 U	1 U	1 U	1 U
Bromochloromethane	1 U	1 U	1 U	1 U
Bromodichloromethane	1 U	1 U	1 U	1 U
Bromoform	1 U	1 U	1 U	1 U
Bromomethane	1 U	1 U	1 U	1 U
Carbon disulfide	1 U	0.7 UJ	0.3 UJ	0.5 UJ
Carbon tetrachloride	1 U	1 U	1 U	1 U
Chlorobenzene	1 U	1 U	1 U	1 U
Chloroethane	1 U	1 U	1 U	1 U
Chloroform	1 U	1 U	1 U	1 U
Chloromethane	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	1 U	1 U	1 U	1 U
Dibromochloromethane	1 U	1 U	1 U	1 U
Ethylbenzene	1 U	1 U	1 U	1 U
Methylene chloride	1 U	1 U	1 U	1 U
Styrene	1 U	1 U	1 U	1 U
Tetrachloroethene	1 U	1 U	1 U	1 U
Toluene	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	1 U	1 U	1 U	1 U

See notes at end of table.

Table E-5 (Continued)
Summary of Groundwater Analytical Results
Low Detection Limits Volatile Organics
Study Area 5

BRAC Environmental Site-Screening Report
 Naval Training Center
 Orlando, Florida

Identifier	05G00101	05G00201	05G00301	05G00301D
Sampling Date	11-Nov-94	10-Nov-94	10-Nov-94	10-Nov-94
trans-1,3-Dichloropropene	1 U	1 U	1 U	1 U
Trichloroethene	1 U	1 U	1 U	1 U
Vinyl chloride	1 U	1 U	1 U	1 U
Xylene (total)	1 U	1 U	1 U	1 U

Notes: Analytical results expressed in micrograms per liter ($\mu\text{g}/\text{l}$).

- U = Compound not detected at the reporting limit.
- J = Reported concentration is an estimated quantity.
- R = Data rejected during validation.

**Table E-6
Summary of Groundwater Analytical Results
Target Compound List Semivolatile Organics
Study Area 5**

BRAC Environmental Site-Screening Report
Naval Training Center
Orlando, Florida

Identifier	05G00101		05G00201		05G00301		05G00301D	
	Sampling Date	11-Nov-94	10-Nov-94	10-Nov-94	10-Nov-94	10-Nov-94		
1,2,4-Trichlorobenzene	10	U	10	U	10	U	10	U
1,2-Dichlorobenzene	10	U	10	U	10	U	10	U
1,3-Dichlorobenzene	10	U	10	U	10	U	10	U
1,4-Dichlorobenzene	10	U	10	U	10	U	10	U
2,2'-oxybis(1-Chloropropane)	10	U	10	U	10	U	10	U
2,4,5-Trichlorophenol	25	U	25	U	25	U	25	U
2,4,6-Trichlorophenol	10	U	10	U	10	U	10	U
2,4-Dichlorophenol	10	U	10	U	10	U	10	U
2,4-Dimethylphenol	10	U	10	U	10	U	10	U
2,4-Dinitrophenol	25	U	25	U	25	U	25	U
2,4-Dinitrotoluene	10	U	10	U	10	U	10	U
2,6-Dinitrotoluene	10	U	10	U	10	U	10	U
2-Chloronaphthalene	10	U	10	U	10	U	10	U
2-Chlorophenol	10	U	10	U	10	U	10	U
2-Methylnaphthalene	10	U	10	U	10	U	10	U
2-Methylphenol	10	U	10	U	10	U	10	U
2-Nitroaniline	25	U	25	U	25	U	25	U
2-Nitrophenol	10	U	10	U	10	U	10	U
3,3'-Dichlorobenzidine	10	U	10	U	10	U	10	U
3-Nitroaniline	25	U	25	U	25	U	25	U
4,6-Dinitro-2-methylphenol	25	U	25	U	25	U	25	U
4-Bromophenyl-phenylether	10	U	10	U	10	U	10	U
4-Chloro-3-methylphenol	10	U	10	U	10	U	10	U
4-Chloroaniline	10	U	10	U	10	U	10	U
4-Chlorophenyl-phenylether	10	U	10	U	10	U	10	U
4-Methylphenol	10	U	10	U	10	U	10	U
4-Nitroaniline	25	U	25	U	25	U	25	U
4-Nitrophenol	25	U	25	U	25	U	25	U
Acenaphthene	10	U	10	U	10	U	10	U
Acenaphthylene	10	U	10	U	10	U	10	U
Anthracene	10	U	10	U	10	U	10	U
Benzo(a)anthracene	10	U	10	U	10	U	10	U
Benzo(a)pyrene	0.1	U	0.1	U	0.1	U	0.1	U
Benzo(b)fluoranthene	10	U	10	U	10	U	10	U
Benzo(g,h,i)perylene	10	U	10	U	10	U	10	U
Benzo(k)fluoranthene	10	U	10	U	10	U	10	U

See notes at end of table.

Table E-6 (Continued)
Summary of Groundwater Analytical Results
Target Compound List Semivolatile Organics
Study Area 5

BRAC Environmental Site-Screening Report
 Naval Training Center
 Orlando, Florida

Identifier	05G00101		05G00201		05G00301		05G00301D	
	Sampling Date	11-Nov-94	10-Nov-94	10-Nov-94	10-Nov-94	10-Nov-94	10-Nov-94	10-Nov-94
bis(2-Chloroethoxy)methane	10	U	10	U	10	U	10	U
bis(2-Chloroethyl)ether	10	U	10	U	10	U	10	U
bis(2-Ethylhexyl)phthalate	1	U	1	U	1	U	1	U
Butylbenzylphthalate	10	U	10	U	10	U	10	U
Carbazole	10	U	10	U	10	U	10	U
Chrysene	10	U	10	U	10	U	10	U
Di-n-butylphthalate	10	U	10	U	10	U	10	U
Di-n-octylphthalate	10	U	10	U	10	U	10	U
Dibenz(a,h)anthracene	10	U	10	U	10	U	10	U
Dibenzofuran	10	U	10	U	10	U	10	U
Diethylphthalate	10	U	10	U	10	U	10	U
Dimethylphthalate	10	U	10	U	10	U	10	U
Fluoranthene	10	U	10	U	10	U	10	U
Fluorene	10	U	10	U	10	U	10	U
Hexachlorobenzene	1	U	1	U	1	U	1	U
Hexachlorobutadiene	10	U	10	U	10	U	10	U
Hexachlorocyclopentadiene	10	U	10	U	10	U	10	U
Hexachloroethane	10	U	10	U	10	U	10	U
Indeno(1,2,3-cd)pyrene	10	U	10	U	10	U	10	U
Isophorone	10	U	10	U	10	U	10	U
N-Nitroso-di-n-propylamine	10	U	10	U	10	U	10	U
N-Nitrosodiphenylamine ¹	10	U	10	U	10	U	10	U
Naphthalene	10	U	10	U	10	U	10	U
Nitrobenzene	10	U	10	U	10	U	10	U
Pentachlorophenol	1	U	1	U	1	U	1	U
Phenanthrene	10	U	10	U	10	U	10	U
Phenol	10	U	10	U	10	U	10	U
Pyrene	10	U	10	U	10	U	10	U

Notes: Analytical results expressed in micrograms per liter ($\mu\text{g}/\text{L}$).

U = Compound not detected at the contract-required quantitation limit (CRQL).

Low detection limit analytical results indicated for Benzo(a)pyrene were obtained using High Pressure Liquid Chromatography, Method 8310(MOD).

Low detection limit analytical results indicated for bis(2-Ethylhexyl)phthalate, hexachlorobenzene, and pentachlorophenol were obtained using Selective Ion Monitoring chromatography.

Table E-7
Summary of Groundwater Analytical Results
Target Compound List Pesticides/PCBs
Study Area 5

BRAC Environmental Site-Screening Report
 Naval Training Center
 Orlando, Florida

Identifier	05G00101	05G00201	05G00301	05G00301D
Sampling Date	11-Nov-94	10-Nov-94	10-Nov-94	10-Nov-94
4,4'-DDD	0.1 U	0.1 U	0.1 U	0.1 U
4,4'-DDE	0.1 U	0.1 U	0.1 U	0.1 U
4,4'-DDT	0.1 U	0.1 U	0.1 U	0.1 U
Aldrin	0.05 U	0.05 U	0.05 U	0.05 U
alpha-BHC	0.05 U	0.05 U	0.05 U	0.05 U
alpha-Chlordane	0.05 U	0.05 U	0.05 U	0.05 U
Aroclor-1016	0.5 U	0.5 U	0.5 U	0.5 U
Aroclor-1221	0.5 U	0.5 U	0.5 U	0.5 U
Aroclor-1232	0.5 U	0.5 U	0.5 U	0.5 U
Aroclor-1242	0.5 U	0.5 U	0.5 U	0.5 U
Aroclor-1248	0.5 U	0.5 U	0.5 U	0.5 U
Aroclor-1254	0.5 U	0.5 U	0.5 U	0.5 U
Aroclor-1260	0.5 U	0.5 U	0.5 U	0.5 U
beta-BHC	0.05 U	0.05 U	0.05 U	0.05 U
delta-BHC	0.05 U	0.05 U	0.05 U	0.05 U
Dieldrin	0.1 U	0.1 U	0.1 U	0.1 U
Endosulfan I	0.05 U	0.05 U	0.05 U	0.05 U
Endosulfan II	0.1 U	0.1 U	0.1 U	0.1 U
Endosulfan sulfate	0.1 U	0.1 U	0.1 U	0.1 U
Endrin	0.1 U	0.1 U	0.1 U	0.1 U
Endrin aldehyde	0.1 U	0.1 U	0.1 U	0.1 U
Endrin ketone	0.1 U	0.1 U	0.1 U	0.1 U
gamma-BHC (Lindane)	0.05 U	0.05 U	0.05 U	0.05 U
gamma-Chlordane	0.05 U	0.05 U	0.05 U	0.05 U
Heptachlor	0.05 U	0.05 U	0.05 U	0.05 U
Heptachlor epoxide	0.05 U	0.05 U	0.05 U	0.05 U
Methoxychlor	0.5 U	0.5 U	0.5 U	0.5 U
Toxaphene	5 U	5 U	5 U	5 U

Notes: Analytical results expressed in micrograms per liter ($\mu\text{g}/\text{l}$).

U = Compound not detected at the contract-required quantitation limit (CRQL).

Table E-8
Summary of Groundwater Analytical Results
Target Analyte List Metals
Study Area 5

BRAC Environmental Site-Screening Report
 Naval Training Center
 Orlando, Florida

Identifier	05G00101	05G00201	05G00301	05G00301D
Sampling Date	11-Nov-94	10-Nov-94	10-Nov-94	10-Nov-94
Aluminum	264	194 B	269	253
Antimony	1.6 U	2.2 UJ	2 UJ	1.2 U
Arsenic	1.6 U	1.5 U	1.5 U	1.5 U
Barium	9.3 B	7.2 B	10.7 B	10 B
Beryllium	0.2 U	0.2 U	0.2 U	0.2 U
Cadmium	2.1 U	2.1 U	2.1 U	2.1 U
Calcium	20100	2400 B	1600 B	1560 B
Chromium	1.9 U	1.9 U	1.9 U	1.9 U
Cobalt	2.6 U	2.6 U	2.6 U	2.6 U
Copper	3.4 U	3 U	1.5 U	4.9 U
Iron	467	463	482	463
Lead	1.7 B	1.3 B	1.3 U	1.3 U
Magnesium	2630 B	992 B	1770 B	1720 B
Manganese	8.7 B	2.3 B	2.6 B	2.4 B
Mercury	0.02 U	0.02 U	0.02 U	0.02 U
Nickel	9.1 U	9.1 U	9.1 U	9.1 U
Potassium	4850 B	1320 B	1480 B	1410 B
Selenium	2 U	2 U	2 U	2 U
Silver	2.2 U	2.2 U	2.2 U	2.2 U
Sodium	5620	6720	7540	7240
Thallium	1.3 U	1.3 U	1.3 UJ	13.2 UJ
Vanadium	4.4 B	2.5 U	2.5 U	3.2 B
Zinc	3 B	3.9 B	2 B	3.5 B

Notes: Analytical results expressed in micrograms per liter ($\mu\text{g}/\text{l}$).

U = Analyte not detected at the reporting limit.

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

J = Reported concentration is an estimated value.