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NAS CECIL FIELD
5090.3a

SAMPLING AND ANALYSIS REPORT FOR FACILITY 616 STANDBY GENERATOR
BUILDING NAS CECIL FIELD FL
6/1/1999
HARDING LAWSON ASSOCIATES

SAMPLING AND ANALYSIS REPORT
FACILITY 616
STANDBY GENERATOR BUILDING
BASE REALIGNMENT AND CLOSURE
ZONE A, YELLOW WATER WEAPONS COMPOUND

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Unit Identification Code: N60200

Contract No.: N62467-89-D-0317/090

Prepared by:

Harding Lawson Associates
2590 Executive Center Circle, East
Tallahassee, Florida 32301

Prepared for:

Department of the Navy, Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29419

Scott Glass, Code 18B12, BRAC Environmental Coordinator

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Revision 1.0

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GLOSSARY

ABB-ES	ABB Environmental Services, Inc
BCT	Base Realignment and Closure cleanup team
BRAC	Base Realignment and Closure
EBS	environmental baseline survey
ELCR	excess lifetime cancer risk
FDEP	Florida Department of Environmental Protection
HLA	Harding Lawson Associates
HI	hazard index
HQ	hazard quotient
NAS	Naval Air Station
PCB	polychlorinated biphenyl
ppm	parts per million
PRE	preliminary risk evaluation
RBC	risk-based concentration
SAO	sampling and analysis outline
SCTL	soil cleanup target level
TRPH	total recoverable petroleum hydrocarbons
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank

1.0 INTRODUCTION

Harding Lawson Associates (HLA) (formerly ABB Environmental Services, Inc. [ABB-ES]), under contract to Southern Division, Naval Facilities Engineering Command, has completed the Phase II Sampling and Analysis program for Facility 616 at Naval Air Station (NAS) Cecil Field. This report summarizes the related field operations, results, conclusions, and recommendations of the Phase II investigation.

Facility 616 is referred to as a Standby Generator Building in the Base Realignment and Closure (BRAC) NAS Cecil Field Environmental Baseline Survey (EBS) Report (ABB-ES, 1994a). Facility 616 is located at the northwest corner of the intersection of East Perimeter Road and Warehouse Road, in the Yellow Water Weapons Compound (Figure 1).

Facility 616 was color-coded Gray in the EBS Report, due to the presence of a 5,000-gallon diesel fuel underground storage tank (UST), a pad-mounted electrical transformer, and friable asbestos material within the building. An additional concern, identified during an HLA site reconnaissance walkover in August 1995, involves stained soil and stressed vegetation observed beneath a pipe protruding from the north wall of the building. This pipe is connected to the oil pans of diesel engines within the building and is likely used for engine maintenance.

The UST formerly associated with the building was removed in April 1997. Excessively contaminated soil was removed during the tank excavation and no further action was recommended and approved for the UST site at Facility 616.

The 1993 NAS Cecil Field Oil-Filled Electrical Distribution Inventory indicates the dielectric fluid in the pad-mounted transformer contains 10 parts per million (ppm) polychlorinated biphenyls (PCBs). The 1993 inventory also identifies a PCB-contaminated pole-mounted transformer (210 ppm) located southwest of Building 616. No visible indications of dielectric fluid leakage were noted during the EBS or subsequent site walkovers. Management of PCB-contaminated electrical equipment is coordinated through NAS Cecil Field Environmental Department.

The Asbestos Management Plan indicates that asbestos containing materials in Facility 616 are in fair condition and may be adequately managed through implementation of an operations and maintenance program.

A sampling and analysis outline (SAO), prepared by HLA and approved by the BRAC cleanup team (BCT) (ABB-ES, 1996), includes a plan for assessment of surface soil in the area of stained soil and stressed vegetation near the oil service pipe protruding from the north wall of Facility 616. The results of the Phase II Sampling and Analysis program developed in the SAO are discussed below.

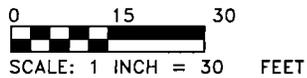
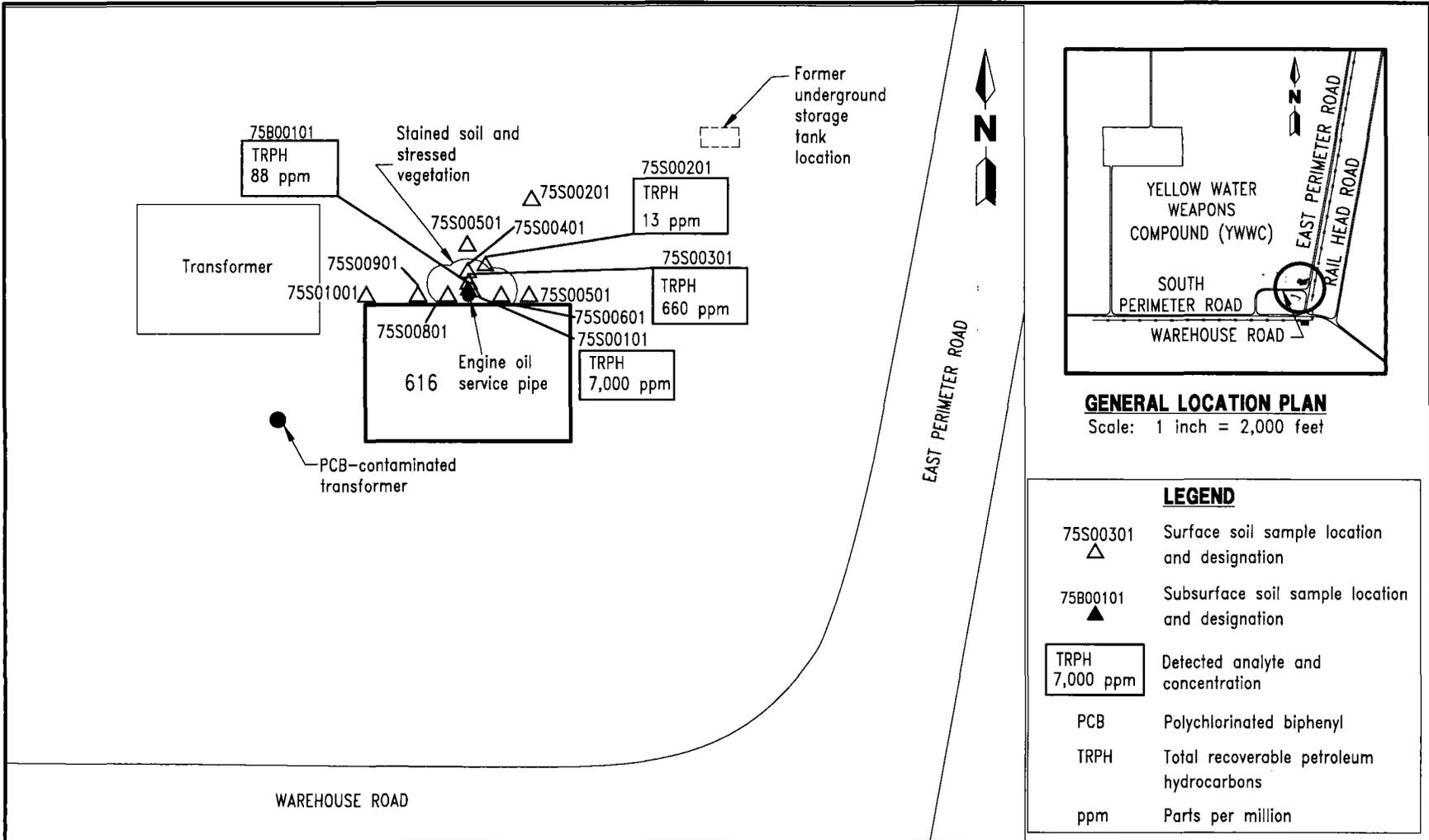


FIGURE 1
FACILITY 616
STANDBY GENERATOR BUILDING
SAMPLE LOCATION PLAN



SAMPLING AND ANALYSIS REPORT

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

2.0 PHASE II INVESTIGATION

The Phase II investigation included the collection of one surface soil sample from the area beneath the oil-service pipe on the north side of the building, and one sample of surface soil outside the visibly affected area. The soil sample was analyzed for total recoverable petroleum hydrocarbons (TRPH) and Contract Laboratory Program target analyte list inorganics.

Following a preliminary review of analytical data, the BCT identified a requirement for additional samples to determine the extent of TRPH contamination. Nine additional samples were collected during two field efforts, to delineate the extent of TRPH contamination. The additional soil samples were analyzed for TRPH (only). One subsurface soil sample was collected from the center of the area of stressed vegetation, approximately 1 foot north of the building. The sample was collected from an interval 3 to 4 feet below land surface, just above the groundwater table. The remainder of the additional samples were collected between 0 and 1-foot below land surface.

Field activities were undertaken in general conformance with the Project Operations Plan (ABB-ES, 1994b). A site plan indicating the sample locations is presented on Figure 1.

3.0 PRELIMINARY RISK EVALUATION

A preliminary risk evaluation (PRE) was conducted to assess potential risks to human and ecological receptors posed by contaminants in environmental media. Primary exposure pathways were evaluated to determine those pathways that potentially contribute to human health and ecological risks. The evaluation was conducted in general conformance with methodology provided in the U.S. Environmental Protection Agency (USEPA) Region IV memorandum entitled "Amended Guidance on PREs for the Purpose of Reaching a Finding of Suitability to Lease (FOSL)" (USEPA, 1994), USEPA Region IV bulletin on Ecological Risk Assessment (USEPA, 1995), and minutes of meetings with the USEPA and the Florida Department of Environmental Protection (FDEP) concerning PREs (ABB-ES, 1995). Site background information and rationale for sample collection and analysis are detailed in the EBS Report (ABB-ES, 1994a) and the SAO (ABB-ES, 1996).

Inorganic analytes were compared to NAS Cecil Field screening criteria for inorganics established by the NAS Cecil Field partnering team. The NAS Cecil Field inorganic background data set was determined by using the nonparametric upper-outside value cutoffs as described in *Understanding Robust and Exploratory Data Analysis* (Hoaglin et al., 1983). These screening values were developed from data collected throughout NAS Cecil Field. No risk evaluation was conducted for inorganic analytes detected below NAS Cecil Field screening criteria for inorganics.

3.1 PUBLIC HEALTH PRE. All detected analytes were compared to readily available risk-based screening values to assess the likelihood of adverse human health effects associated with potential exposure to surface soil. Risk-based screening

values were obtained from USEPA Region III Risk-Based Concentrations (RBCs) (USEPA, 1996) and FDEP Soil Cleanup Target Levels (SCTLs) (FDEP, 1998).

Most screening values published in the references listed above are based on toxicity constants and standard human exposure scenarios and correspond to fixed levels of risk. The designated level of risk for noncarcinogenic chemicals is based on a hazard quotient (HQ) of 1. The level of risk for carcinogenic chemicals is based on an excess lifetime cancer risk (ELCR) of 1×10^{-6} . Cancer and noncancer risks associated with industrial and residential land use are estimated by dividing the maximum detected analyte concentration by the corresponding USEPA Region III RBC value at the designated level of risk (HQ of 1 or ELCR of 1×10^{-6}). For noncarcinogens, the HQs are summed to determine the cumulative noncancer risk or hazard index (HI).

Fourteen inorganic analytes were detected in the soil samples collected in the study area. Barium, calcium, and copper were detected at concentrations in excess of NAS Cecil Field inorganic background data set; however, no FDEP SCTLs were exceeded.

TRPH was detected at concentrations in excess of FDEP SCTLs in 5 surface soil samples. Concentrations of detected analytes in soil samples are compared to NAS Cecil Field screening criteria for inorganics and FDEP SCTLs in Appendix A. There is no RBC applicable to TRPH; therefore, no HI or ELCR was calculated.

3.2 ECOLOGICAL PRE. An ecological PRE was conducted to evaluate potential risks to ecological receptors in the vicinity of Facility 616. Exposure pathways and ecological habitat associated with Facility 616 were characterized by HLA ecological risk assessors in June 1996. Facility 616 is located at the northwest corner of the intersection of East Perimeter Road and Warehouse Road, in the Yellow Water Weapons Compound. The methods and assumptions used in derivation of ecological screening values applied in this evaluation are presented in the Project Operations Plan (ABB-ES, 1994b).

Ecological habitat at Facility 616 is limited to small areas of maintained grass surrounding the building. Ecological receptors that might occasionally use the study area are likely limited to terrestrial species that are tolerant to human and industrial activity. Small passerines, such as the American robin (*Turdus migratorius*), could occasionally forage for terrestrial invertebrates in the grassy portions of the study area. Small mammals, such as the cotton mouse (*Peromyscus gossypinus*), could potentially feed on grasses and seeds in the grassy areas of the study area. Soil invertebrates, such as the earthworm, are likely present in the grassy areas.

Pathways of potential contamination exposure at Facility 616 for wildlife receptors include direct contact, incidental ingestion of surface soil, and limited terrestrial food-web model exposure to contaminants in surface soil that may bioaccumulate. Pathways for soil invertebrates include direct contact and incidental ingestion of surface soil. Pathways for terrestrial plants include direct contact with surface soil.

Table 2 compares concentrations of detected analytes to NAS Cecil Field screening criteria for inorganics and ecological screening values. A maximum concentration of 30.2 ppm of barium and a maximum concentration of 13.5 ppm of copper were

detected at location 75S00101, exceeding the NAS Cecil Field screening values of 14.4 and 5.96 ppm, respectively. However, these inorganic analytes did not exceed ecological screening values.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the available information, the asbestos-containing materials and PCB-contaminated transformer identified in the EBS as potential environmental concerns for Facility 616 do not presently represent a hazard to human health or the environment, if properly managed and maintained. Petroleum contamination associated with the former UST has been addressed separately in accordance with the Tank Management Plan and no further action has been recommended and approved.

The TRPH concentration associated with the oil-service pipe protruding from the north side of the building decreases significantly with increasing distance from the pipe. The extent of TRPH contamination has been delineated. A specification for removal of contaminated soil is provided in Appendix C.

The color classification for Facility 616 should be changed to 5/Yellow until all remedial actions necessary to remove petroleum-contaminated soils from the vicinity of the oil-service pipe have been completed.

REFERENCES

- ABB Environmental Services, Inc. (ABB-ES). 1994a. *Base Realignment and Closure Environmental Baseline Survey Report, Naval Air Station Cecil Field, Jacksonville, Florida*. Prepared for Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), North Charleston, South Carolina (December).
- ABB-ES. 1994b. *Project Operations Plan for Cecil Field and Health and Safety Plan*. Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina (November).
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- ABB-ES. 1996. *Sampling and Analysis Outline, Facility 616, Base Realignment and Closure, Zone A, Yellow Water Weapons Compound, Group VII, Naval Air Station Cecil Field, Jacksonville, Florida*. Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina (March).
- Florida Department of Environmental Protection. 1998. *Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-785, Florida Administrative Code*. Prepared for Division of Waste Management (April).
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- USEPA. 1996. *Region III Risk-Based Screening Table, Technical Guidance Manual*. Risk Assessment. EPA/903/R-93-001 (May).

APPENDIX A
PRELIMINARY RISK EVALUATION TABLES

TRPH Delineation Results
Facility 616, Naval Air Station Cecil Field

TPH C8-C40	
Sample	Concentration (mg/kg)
75S00101	7000
75S00201	13
75B00101	88
75S00301	660
75S00401	39
75S00501	8
75S00601	1900
75S00701	63
75S00801	13000
75S00901	3800
75S01001	47

**BRAC Preliminary Risk Evaluation Table for Analytes Detected in Surface Soil
Facility 616, Naval Air Station Cecil Field**

Analyte	Samples				Screening Values			Calculated Risk Values	
	75S00101	75S00201	75S00301	75B00101	BKGRD	SCTL	RBC(R)	ELCR	HI
<u>Inorganic Analytes</u>									
Aluminum	1190	1190			4432	72000	78000	n	
Antimony		0.58			9.44	26	31	n	
*Barium	30.2	7.5			14.4	105	5500	n	
*Calcium	642	1150			9.44				
Chromium	7	2.6			7.75	290	390	n	
*Copper	13.5	5			5.96	105	3100	n	
Iron	285	1490			1490	23000	23000	n	
Lead	11.8	4.8			197	500			
Magnesium	26.8	48.1			329				
Manganese	2	3.5			22	1600	1800	n	
Nickel	3.1	0.67			3.89	105	1600	n	
Sodium	157	143			343				
Vanadium	1.1	2.8			6.3	15	550	n	
Zinc	15.1	7.5			36.5	23000	23000	n	
<u>General Chemistry</u>									
Total petroleum hydrocarbons	7000	13	660	88		350			

Notes:

¹ All detected analytes are reported. Concentrations and screening values are expressed in mg/kg

²ELCR and HI are only calculated for analytes detected at concentrations in excess of BKGRD and SCTL

*= Background screening criteria or SCTLs have been exceeded

BKGRD=NAS Cecil Field Inorganic Background Data Set

SCTL = Soil Cleanup Target Level, Chapter 62-785, Florida Administrative Code

RBC(R)= Risk-based Concentration (Residential), USEPA Region III, April 1998

c=carcinogenic risk

n=non-carcinogenic risk

ELCR = calculated excess lifetime cancer risk, based on RBC(R) values. (ELCR = detected concentration/RBC(R) * 1 E-06)

HI = calculated Hazard Index for non-carcinogenic analytes (HI=detected concentration/RBC(R))

**BRAC Preliminary Ecological Risk Evaluation Table for Analytes Detected in Surface Soil
Facility 616, Naval Air Station Cecil Field**

Analyte	Sample Identifier				BKGRD ¹	Screening Criteria			Criteria Exceeded ⁵
	75S00101	75S00201	75S00301	75B00101		Plant ²	Invert ³	Vert ⁴	
Inorganic Analytes									
Aluminum	1190	1190			4432	50		54000	
Antimony	0	0.58			9.44	5		5100	
Barium	30.2	7.5			14.4	500		23000	B
Calcium	642	1150			9.44				B
Chromium	7	2.6			7.75	1	50	14000	
Copper	13.5	5			5.96	100	30	1000	B
Iron	285	1490			1490				
Lead	11.8	4.8			197	50	1190	260	
Magnesium	26.8	48.1			329				
Manganese	2	3.5			22	500		5800	
Nickel	3.1	0.67			3.89	30	400	550	
Sodium	157	143			343				
Vanadium	1.1	2.8			6.3	2		1100	
Zinc	15.1	7.5			36.5	50	130	1600	
General Chemistry									
Total petroleum hydrocarbons	7000	13	660	88					

Notes:

All detected analytes are reported. Concentrations and screening values are expressed in mg/kg.

Screening Criteria (refer to the Project Operations Plan, ABB-ES, 1995, Appendix A for details)

¹ NAS Cecil Field screening values for inorganic analytes in surface soil at NAS Cecil Field.

² Terrestrial Plant Toxicity Screening Value

³ Invertebrate Toxicity Screening Value

⁴ Vertebrate (Wildlife) Toxicity Screening Value

⁵ Screening criteria have been exceeded for background and the receptor group(s) represented by the following letter codes:

B=Background, P=Plant, I= Invertebrate, V=Vertebrate (Wildlife)

APPENDIX B
LABORATORY ANALYTICAL DATA

NAS CECIL FIELD -- FACILITY 616
 SURFACE SOIL -- INORGANICS -- REPORT REQUEST NO. 11036

Lab Sample Number:	C2WAA	C2WAD				
Site	CECILBRAC2	CECILBRAC2				
Locator	75S00101	75S00201				
Collect Date:	06-FEB-96	06-FEB-96				
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL

CLP METALS AND CYANIDE

Aluminum	1190	mg/kg	40	1190	mg/kg	40
Antimony	.48 U	mg/kg	12	.58 J	mg/kg	12
Arsenic	.72 U	mg/kg	2	.72 U	mg/kg	2
Barium	30.2 J	mg/kg	40	7.5 J	mg/kg	40
Beryllium	.24 U	mg/kg	1	.24 U	mg/kg	1
Cadmium	.24 U	mg/kg	1	.24 U	mg/kg	1
Calcium	642 J	mg/kg	1000	1150 J	mg/kg	1000
Chromium	7	mg/kg	2	2.6	mg/kg	2
Cobalt	.48 U	mg/kg	10	.48 U	mg/kg	10
Copper	13.5	mg/kg	5	5 J	mg/kg	5
Iron	285	mg/kg	20	1490	mg/kg	20
Lead	11.8 J	mg/kg	.6	4.8 J	mg/kg	.6
Magnesium	26.8 J	mg/kg	1000	48.1 J	mg/kg	1000
Manganese	2 J	mg/kg	3	3.5 J	mg/kg	3
Mercury	.12 U	mg/kg	.1	.12 U	mg/kg	.1
Nickel	3.1 J	mg/kg	8	.67 J	mg/kg	8
Potassium	21.9 U	mg/kg	1000	21.9 U	mg/kg	1000
Selenium	.72 U	mg/kg	1	.72 U	mg/kg	1
Silver	.24 U	mg/kg	2	.24 U	mg/kg	2
Sodium	157 J	mg/kg	1000	143 J	mg/kg	1000
Thallium	.96 U	mg/kg	2	.96 U	mg/kg	2
Vanadium	1.1 J	mg/kg	10	2.8 J	mg/kg	10
Zinc	15.1	mg/kg	4	7.5	mg/kg	4
Cyanide	.11 U	mg/kg	.5	.12 U	mg/kg	.5

U = NOT DETECTED J = ESTIMATED VALUE
 UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
 R = RESULT IS REJECTED AND UNUSABLE

NAS CECIL FIELD -- FACILITY 616
SURFACE SOIL -- TPH -- REPORT REQUEST NO. 11037

Lab Sample Number:	A680701380		A680701380		
Site	CECILBRAC2		CECILBRAC2		
Locator	75S00101		75S00201		
Collect Date:	06-FEB-96		06-FEB-96		
VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL

TPH						
Total petroleum hydrocarbons	7000	mg/kg	600	13	mg/kg	12

U = NOT DETECTED J = ESTIMATED VALUE
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R = RESULT IS REJECTED AND UNUSABLE

NAS CECIL FIELD -- FACILITY 616
 SURFACE AND SUBSURFACE SOIL -- TPH -- REPORT REQUEST NO. 11038

Lab Sample Number:	JR88982		JR30051		JR30052		JR30053		
Site	BRAC		BRAC		BRAC		BRAC		
Locator	75S00301		75S00401		75S00501		75S00601		
Collect Date:	29-JAN-98		31-AUG-98		31-AUG-98		31-AUG-98		
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL

FLA PRO												
TPH C8-C40	660	mg/kg	78	39	mg/kg	7.8	7.5 U	mg/kg	7.5	1900	mg/kg	8

U = NOT DETECTED J = ESTIMATED VALUE
 UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
 R = RESULT IS REJECTED AND UNUSABLE

NAS CECIL FIELD -- FACILITY 616
 SURFACE AND SUBSURFACE SOIL -- TPH -- REPORT REQUEST NO. 11038

Lab Sample Number:	JR30054	JR30055	JR30056	JR461732					
Site	BRAC	BRAC	BRAC	BRAC					
Locator	75S00701	75S00801	75S00901	75S01001					
Collect Date:	31-AUG-98	31-AUG-98	31-AUG-98	12-DEC-98					
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL

FLA PRO												
TPH C8-C40	63	mg/kg	8.1	13000	mg/kg	160	3800	mg/kg	80	47	mg/kg	7.6

U = NOT DETECTED J = ESTIMATED VALUE
 UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
 R = RESULT IS REJECTED AND UNUSABLE

NAS CECIL FIELD -- FACILITY 616
SURFACE AND SUBSURFACE SOIL -- TPH -- REPORT REQUEST NO. 11038

Lab Sample Number: JR88981
Site BRAC
Locator 75B00101
Collect Date: 29-JAN-98

VALUE QUAL UNITS DL

FLA PRO			
TPH C8-C40	88	mg/kg	7.5

U = NOT DETECTED J = ESTIMATED VALUE
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R = RESULT IS REJECTED AND UNUSABLE

APPENDIX C
SOIL EXCAVATION SPECIFICATIONS

Building 616

Site Background

Petroleum constituents were detected at concentrations in excess of the residential soil cleanup goal for total recoverable petroleum hydrocarbons (350mg/kg) in surface soil samples collected in the area to be excavated. The contaminants are likely present due to release from an oil drain valve. Details are included in the Sampling and Analysis Report for Building 616 (ABB-ES, June 1999).

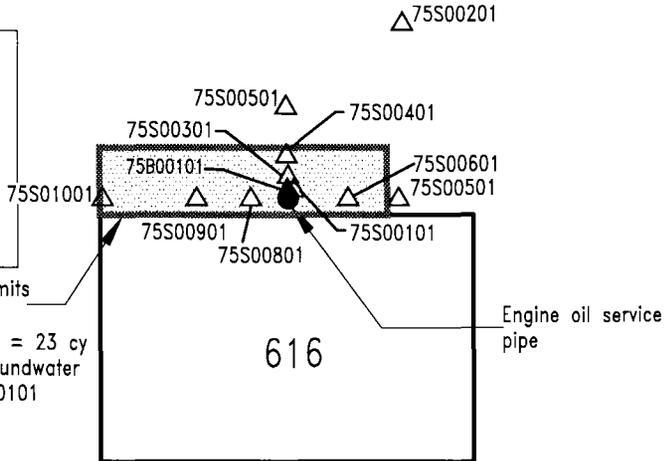
Guidance Notes

1. This information is provided for general guidance purposes only. The actual extent of the excavation will be defined by HLA with white spray-down paint (or equivalent), prior to the execution of the removal action.
2. The schedule and methods of excavation will be determined by the RAC.
3. All aspects of work-site health and safety will be the responsibility of the RAC.
4. Verification and avoidance of all aboveground and underground utilities or other manmade structures will be the responsibility of the RAC.
5. Except where necessary for avoidance of structures or utilities, or where otherwise specified by HLA, the depth of the excavation should extend to 1' below ground surface. If observations indicate contaminants may extend beyond the planned lateral or vertical limits of the excavation, the RAC should notify HLA.
6. Excavated soil should be stockpiled on, and covered with, heavy-duty polyethylene sheeting at the site. This should be done in such a manner as to avoid the potential for contaminating surrounding soil or surface water. Alternatively, soils may be stockpiled in properly covered rolloff bins.
7. The BCT may approve stockpiling of materials from different sites, provided that similar types and concentrations of contaminants are involved, and contaminants were generated by similar processes.
8. Waste characterization, transport (both on and off site), and disposal of all excavated soils will be completed by the RAC.
9. Materials used to backfill the excavations should be from an uncontaminated source, and should be capable of supporting the same type of vegetation as the soils removed. Except where otherwise approved by the installation manager, the ground surface should be restored to a similar, or better condition, than that which existed prior to excavation.

Warning:
Extensive utilities in this area.
Obtain full aboveground and
belowground utility clearance
before beginning work.

Former
underground
storage tank
location

Transformer



Proposed excavation limits
30' x 7' x 1'depth
Volume to be removed = 23 cy
Excavate locally to groundwater
table at location 75S00101

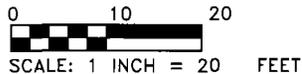
Engine oil service
pipe

EAST PERIMETER ROAD



NOTES:

1. WARNING: Obtain utility clearance before excavating.
2. Extent of excavation to be marked by Harding Lawson Associates.
3. Contaminants of concern are petroleum constituents.
4. Waste characterization, transport, and disposal of all excavated soil is the responsibility of the remedial action contractor.
5. Return site to preexcavation conditions.



LEGEND

75S00301 Surface soil sample location and designation
△

75B00101 Subsurface soil sample location and designation
▲

 Area to be excavated

cy Cubic yards

**APPENDIX C
FACILITY 616
STANDBY GENERATOR BUILDING
PROPOSED SOIL EXCAVATION**



SAMPLING AND ANALYSIS REPORT

**NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

SAMPLING AND ANALYSIS REPORT
FACILITY 616
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Harding Lawson Associates
2590 Executive Center Circle, East
Tallahassee, Florida 32301

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Department of the Navy, Southern Division
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2155 Eagle Drive
North Charleston, South Carolina 29419

David Porter, Code 18B2, BRAC Environmental Coordinator

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BRAC	Base Realignment and Closure
EBS	environmental baseline survey
ELCR	excess lifetime cancer risk
FDEP	Florida Department of Environmental Protection
HLA	Harding Lawson Associates
HI	hazard index
HQ	hazard quotient
NAS	Naval Air Station
PCB	polychlorinated biphenyl
ppm	parts per million
PRE	preliminary risk evaluation
RBC	risk-based concentration
SAO	sampling and analysis outline
SCTL	soil cleanup target level
TRPH	total recoverable petroleum hydrocarbons
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank

1.0 INTRODUCTION

Harding Lawson Associates (HLA) (formerly ABB Environmental Services, Inc. [ABB-ES]), under contract to Southern Division, Naval Facilities Engineering Command, has completed the Phase II Sampling and Analysis program for Facility 616 at Naval Air Station (NAS) Cecil Field. This report summarizes the related field operations, results, conclusions, and recommendations of the Phase II investigation.

Facility 616 is referred to as a Standby Generator Building in the Base Realignment and Closure (BRAC) NAS Cecil Field Environmental Baseline Survey (EBS) Report (ABB-ES, 1994a). Facility 616 is located at the northwest corner of the intersection of East Perimeter Road and Warehouse Road, in the Yellow Water Weapons Compound (Figure 1).

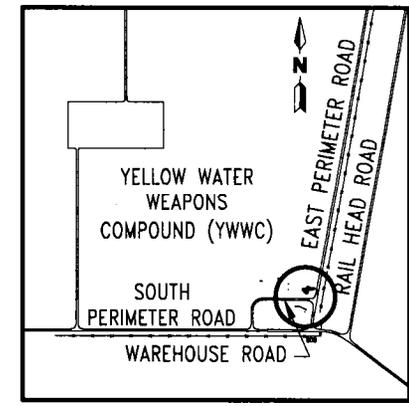
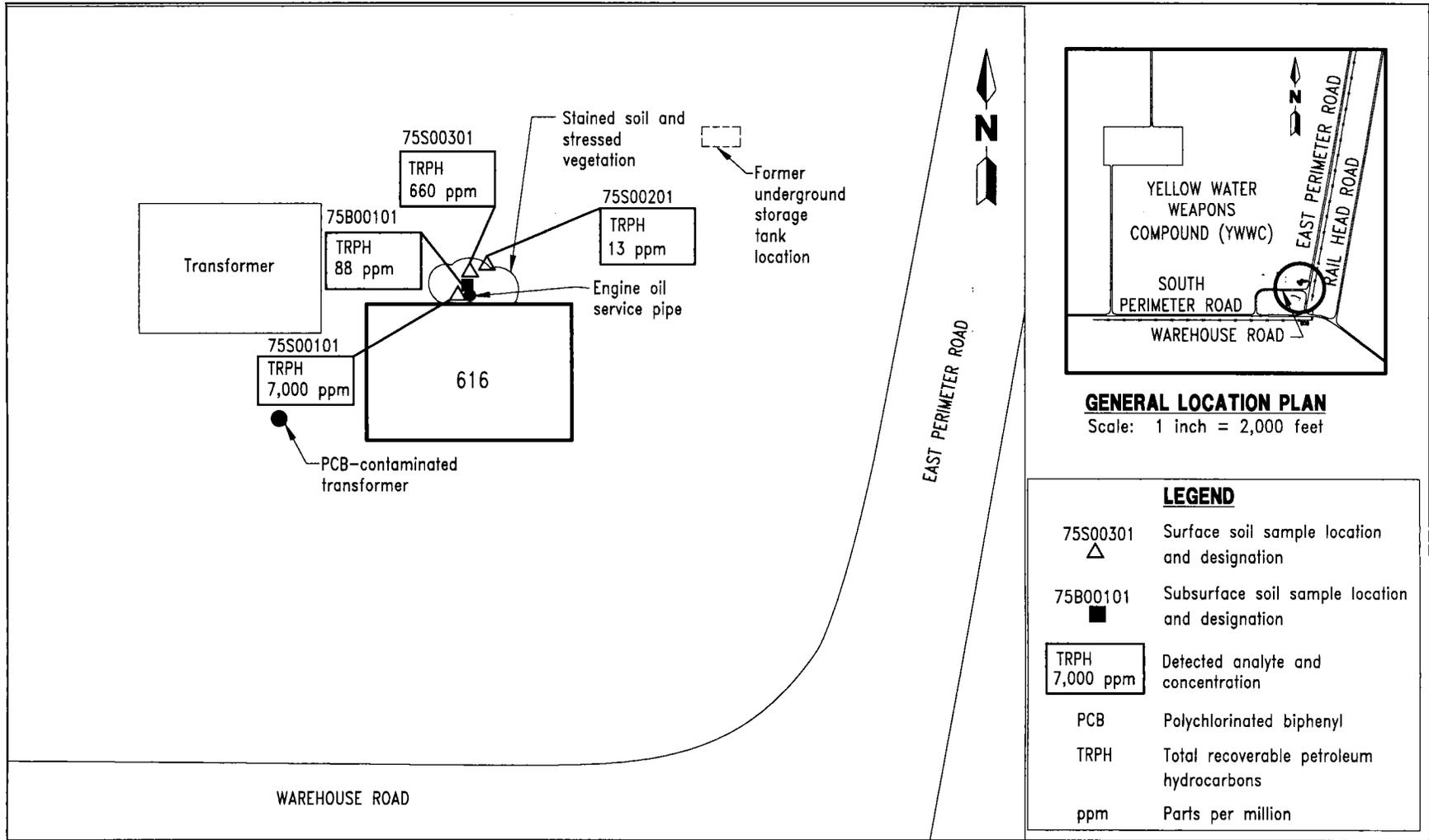
Facility 616 was color-coded Gray in the EBS Report, due to the presence of a 5,000-gallon diesel fuel underground storage tank (UST), a pad-mounted electrical transformer, and friable asbestos material within the building. An additional concern, identified during an HLA site reconnaissance walkover in August 1995, involves stained soil and stressed vegetation observed beneath a pipe protruding from the north wall of the building. This pipe is connected to the oil pans of diesel engines within the building and is likely used for engine maintenance.

The UST formerly associated with the building was removed in April 1997. Excessively contaminated soils were encountered in confirmatory samples collected near the UST. Additional confirmatory sampling was recommended. Environmental concerns associated with the UST are being addressed separately by the Tank Management Plan.

The 1993 NAS Cecil Field Oil-Filled Electrical Distribution Inventory indicates the dielectric fluid in the pad-mounted transformer contains 10 parts per million (ppm) polychlorinated biphenyls (PCBs). The 1993 inventory also identifies a PCB-contaminated pole-mounted transformer (210 ppm) located southwest of Building 616. No visible indications of dielectric fluid leakage were noted during the EBS or subsequent site walkovers. Management of PCB-contaminated electrical equipment is coordinated through NAS Cecil Field Environmental Department.

The Asbestos Management Plan indicates that asbestos containing materials in Facility 616 are in fair condition and may be adequately managed through implementation of an operations and maintenance program.

A sampling and analysis outline (SAO), prepared by HLA and approved by the BRAC cleanup team (BCT) (ABB-ES, 1996), includes a plan for assessment of surface soil in the area of stained soil and stressed vegetation near the oil service pipe protruding from the north wall of Facility 616. The results of the Phase II Sampling and Analysis program developed in the SAO are discussed below.



GENERAL LOCATION PLAN
Scale: 1 inch = 2,000 feet

LEGEND

75S00301 △	Surface soil sample location and designation
75B00101 ■	Subsurface soil sample location and designation
TRPH 7,000 ppm	Detected analyte and concentration
PCB	Polychlorinated biphenyl
TRPH	Total recoverable petroleum hydrocarbons
ppm	Parts per million

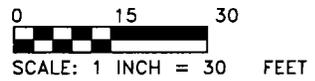


FIGURE 1
FACILITY 616
STANDBY GENERATOR BUILDING
SAMPLE LOCATION PLAN



SAMPLING AND ANALYSIS REPORT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

2.0 PHASE II INVESTIGATION

The Phase II investigation included the collection of one surface soil sample from the area beneath the oil-service pipe on the north side of the building, and one sample of surface soil outside the visibly affected area. The soil samples were analyzed for total recoverable petroleum hydrocarbons (TRPH) and Contract Laboratory Program target analyte list inorganics.

Following a preliminary review of analytical data, the BCT identified a requirement for additional samples to determine the extent of TRPH contamination. One subsurface soil sample was collected from the center of the area of stressed vegetation, approximately 1 foot north of the building. The sample was collected from an interval 3 to 4 feet below land surface, just above the groundwater table. A third surface soil sample was also collected at this time, approximately 3 feet north of the oil service pipe. The additional soil samples were analyzed for TRPH (only).

Field activities were undertaken in general conformance with the Project Operations Plan (ABB-ES, 1994b). A site plan indicating the sample locations is presented on Figure 1.

3.0 PRELIMINARY RISK EVALUATION

A preliminary risk evaluation (PRE) was conducted to assess potential risks to human and ecological receptors posed by contaminants in environmental media. Primary exposure pathways were evaluated to determine those pathways that potentially contribute to human health and ecological risks. The evaluation was conducted in general conformance with methodology provided in the U.S. Environmental Protection Agency (USEPA) Region IV memorandum entitled "Amended Guidance on PREs for the Purpose of Reaching a Finding of Suitability to Lease (FOSL)" (USEPA, 1994), USEPA Region IV bulletin on Ecological Risk Assessment (USEPA, 1995), and minutes of meetings with the USEPA and the Florida Department of Environmental Protection (FDEP) concerning PREs (ABB-ES, 1995). Site background information and rationale for sample collection and analysis are detailed in the EBS Report (ABB-ES, 1994a) and the SAO (ABB-ES, 1996).

Inorganic analytes were compared to NAS Cecil Field screening criteria for inorganics established by the NAS Cecil Field partnering team. The NAS Cecil Field inorganic background data set was determined by using the nonparametric upper-outside value cutoffs as described in *Understanding Robust and Exploratory Data Analysis* (Hoaglin et al., 1983). These screening values were developed from data collected throughout NAS Cecil Field. No risk evaluation was conducted for inorganic analytes detected below NAS Cecil Field screening criteria for inorganics.

3.1 PUBLIC HEALTH PRE. All detected analytes were compared to readily available risk-based screening values to assess the likelihood of adverse human health effects associated with potential exposure to surface soil. Risk-based screening values were obtained from USEPA Region III Risk-Based Concentrations (RBCs) (USEPA, 1996) and FDEP Soil Cleanup Target Levels (SCTLs) (FDEP, 1998).

Most screening values published in the references listed above are based on toxicity constants and standard human exposure scenarios and correspond to fixed levels of risk. The designated level of risk for noncarcinogenic chemicals is based on a hazard quotient (HQ) of 1. The level of risk for carcinogenic chemicals is based on an excess lifetime cancer risk (ELCR) of 1×10^{-6} . Cancer and noncancer risks associated with industrial and residential land use are estimated by dividing the maximum detected analyte concentration by the corresponding USEPA Region III RBC value at the designated level of risk (HQ of 1 or ELCR of 1×10^{-6}). For noncarcinogens, the HQs are summed to determine the cumulative noncancer risk or hazard index (HI).

Fourteen inorganic analytes were detected in the soil samples collected in the study area. Barium, calcium, and copper were detected at concentrations in excess of NAS Cecil Field inorganic background data set; however, no FDEP SCTLs were exceeded.

TRPH was detected at concentrations in excess of FDEP SCTLs in two of the surface soil samples. Concentrations of detected analytes in soil samples are compared to NAS Cecil Field screening criteria for inorganics and FDEP SCTLs in Appendix A. There is no RBC applicable to TRPH; therefore, no HI or ELCR was calculated.

3.2 ECOLOGICAL PRE. An ecological PRE was conducted to evaluate potential risks to ecological receptors in the vicinity of Facility 616. Exposure pathways and ecological habitat associated with Facility 616 were characterized by HLA ecological risk assessors in June 1996. Facility 616 is located at the northwest corner of the intersection of East Perimeter Road and Warehouse Road, in the Yellow Water Weapons Compound. The methods and assumptions used in derivation of ecological screening values applied in this evaluation are presented in the Project Operations Plan (ABB-ES, 1994b).

Ecological habitat at Facility 616 is limited to small areas of maintained grass surrounding the building. Ecological receptors that might occasionally use the study area are likely limited to terrestrial species that are tolerant to human and industrial activity. Small passerines, such as the American robin (*Turdus migratorius*), could occasionally forage for terrestrial invertebrates in the grassy portions of the study area. Small mammals, such as the cotton mouse (*Peromyscus gossypinus*), could potentially feed on grasses and seeds in the grassy areas of the study area. Soil invertebrates, such as the earthworm, are likely present in the grassy areas.

Pathways of potential contamination exposure at Facility 616 for wildlife receptors include direct contact, incidental ingestion of surface soil, and limited terrestrial food-web model exposure to contaminants in surface soil that may bioaccumulate. Pathways for soil invertebrates include direct contact and incidental ingestion of surface soil. Pathways for terrestrial plants include direct contact with surface soil.

Table 2 compares concentrations of detected analytes to NAS Cecil Field screening criteria for inorganics and ecological screening values. A maximum concentration of 30.2 ppm of barium and a maximum concentration of 13.5 ppm of copper were detected at location 75S00101, exceeding the NAS Cecil Field screening values of 14.4 and 5.96 ppm, respectively. However, these inorganic analytes did not exceed ecological screening values.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the available information, the asbestos-containing materials and PCB-contaminated transformer identified in the EBS as potential environmental concerns for Facility 616 do not presently represent a hazard to human health or the environment if properly managed and maintained. Petroleum contamination associated with the former UST is being addressed separately in accordance with the Tank Management Plan.

The TRPH concentration associated with the oil-service pipe protruding from the north side of the building is significantly lower with increasing lateral and vertical distance from the pipe. However, the lateral extent of TRPH contamination has not been adequately delineated. The lateral extent of contamination should be delineated, and excessively contaminated soil should be removed. In addition, a shallow groundwater monitoring well should be installed near the oil-service pipe. A groundwater sample should be collected from the monitoring well and analyzed to determine whether petroleum compounds have impacted the groundwater in the area.

The color classification for Facility 616 should be changed to 5/Yellow until all remedial actions necessary to remove petroleum-contaminated soils from the vicinity of the oil-service pipe and the former UST location have been completed. Additional requirements may be identified on the basis of the groundwater analysis.

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- USEPA. 1996. *Region III Risk-Based Screening Table, Technical Guidance Manual. Risk Assessment. EPA/903/R-93-001* (May).

APPENDIX A
PRELIMINARY RISK EVALUATION TABLES

**BRAC Preliminary Risk Evaluation Table for Analytes Detected in Surface Soil
Facility 616, Naval Air Station Cecil Field**

Analyte	Samples				Screening Values			Calculated Risk Values	
	75S00101	75S00201	75S00301	75B00101	BKGRD	SCTL	RBC(R)	ELCR	HI
Inorganic Analytes									
Aluminum	1190	1190			4432	72000	78000 n		
Antimony		0.58			9.44	26	31 n		
*Barium	30.2	7.5			14.4	105	5500 n		
*Calcium	642	1150			9.44				
Chromium	7	2.6			7.75	290	390 n		
*Copper	13.5	5			5.96	105	3100 n		
Iron	285	1490			1490	23000	23000 n		
Lead	11.8	4.8			197	500			
Magnesium	26.8	48.1			329				
Manganese	2	3.5			22	1600	1800 n		
Nickel	3.1	0.67			3.89	105	1600 n		
Sodium	157	143			343				
Vanadium	1.1	2.8			6.3	15	550 n		
Zinc	15.1	7.5			36.5	23000	23000 n		
General Chemistry									
Total petroleum hydrocarbons	7000	13	660	88		350			

Notes:

¹ All detected analytes are reported. Concentrations and screening values are expressed in mg/kg

²ELCR and HI are only calculated for analytes detected at concentrations in excess of BKGRD and SCTL

*= Background screening criteria or SCTLs have been exceeded

BKGRD=NAS Cecil Field Inorganic Background Data Set

SCTL = Soil Cleanup Target Level, Chapter 62-785, Florida Administrative Code

RBC(R)= Risk-based Concentration (Residential), USEPA Region III, April 1998

c=carcinogenic risk

n=non-carcinogenic risk

ELCR = calculated excess lifetime cancer risk, based on RBC(R) values. (ELCR = detected concentration/RBC(R) * 1 E-06)

HI = calculated Hazard Index for non-carcinogenic analytes (HI=detected concentration/RBC(R))

**BRAC Preliminary Ecological Risk Evaluation Table for Analytes Detected in Surface Soil
Facility 616, Naval Air Station Cecil Field**

Analyte	Sample Identifier				BKGRD ¹	Screening Criteria			Criteria Exceeded ⁵
	75S00101	75S00201	75S00301	75B00101		Plant ²	Invert ³	Vert ⁴	
Inorganic Analytes									
Aluminum	1190	1190			4432	50		54000	
Antimony	0	0.58			9.44	5		5100	
Barium	30.2	7.5			14.4	500		23000	B
Calcium	642	1150			9.44				B
Chromium	7	2.6			7.75	1	.50	14000	
Copper	13.5	5			5.96	100	30	1000	B
Iron	285	1490			1490				
Lead	11.8	4.8			197	50	1190	260	
Magnesium	26.8	48.1			329				
Manganese	2	3.5			22	500		5800	
Nickel	3.1	0.67			3.89	30	400	550	
Sodium	157	143			343				
Vanadium	1.1	2.8			6.3	2		1100	
Zinc	15.1	7.5			36.5	50	130	1600	
General Chemistry									
Total petroleum hydrocarbons	7000	13	660	88					

Notes:

All detected analytes are reported. Concentrations and screening values are expressed in mg/kg.

Screening Criteria (refer to the Project Operations Plan, ABB-ES, 1995, Appendix A for details)

¹ NAS Cecil Field screening values for inorganic analytes in surface soil at NAS Cecil Field.

² Terrestrial Plant Toxicity Screening Value

³ Invertebrate Toxicity Screening Value

⁴ Vertebrate (Wildlife) Toxicity Screening Value

⁵ Screening criteria have been exceeded for background and the receptor group(s) represented by the following letter codes:

B=Background, P=Plant, I= Invertebrate, V=Vertebrate (Wildlife)

APPENDIX B

LABORATORY ANALYTICAL DATA

NAS CECIL FIELD -- FACILITY 616
 SOIL -- INORGANICS -- REQ.NO. 10024

Lab Sample Number:	C2WAA	C2WAD			
Site	CECILBRAC2	CECILBRAC2			
Locator	75S00101	75S00201			
Collect Date:	06-FEB-96	06-FEB-96			
VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL

CLP METALS AND CYANIDE

Aluminum	1190	mg/kg	40	1190	mg/kg	40
Antimony	.48 U	mg/kg	12	.58 J	mg/kg	12
Arsenic	.72 U	mg/kg	2	.72 U	mg/kg	2
Barium	30.2 J	mg/kg	40	7.5 J	mg/kg	40
Beryllium	.24 U	mg/kg	1	.24 U	mg/kg	1
Cadmium	.24 U	mg/kg	1	.24 U	mg/kg	1
Calcium	642 J	mg/kg	1000	1150 J	mg/kg	1000
Chromium	7	mg/kg	2	2.6	mg/kg	2
Cobalt	.48 U	mg/kg	10	.48 U	mg/kg	10
Copper	13.5	mg/kg	5	5 J	mg/kg	5
Iron	285	mg/kg	20	1490	mg/kg	20
Lead	11.8 J	mg/kg	.6	4.8 J	mg/kg	.6
Magnesium	26.8 J	mg/kg	1000	48.1 J	mg/kg	1000
Manganese	2 J	mg/kg	3	3.5 J	mg/kg	3
Mercury	.12 U	mg/kg	.1	.12 U	mg/kg	.1
Nickel	3.1 J	mg/kg	8	.67 J	mg/kg	8
Potassium	21.9 U	mg/kg	1000	21.9 U	mg/kg	1000
Selenium	.72 U	mg/kg	1	.72 U	mg/kg	1
Silver	.24 U	mg/kg	2	.24 U	mg/kg	2
Sodium	157 J	mg/kg	1000	143 J	mg/kg	1000
Thallium	.96 U	mg/kg	2	.96 U	mg/kg	2
Vanadium	1.1 J	mg/kg	10	2.8 J	mg/kg	10
Zinc	15.1	mg/kg	4	7.5	mg/kg	4
Cyanide	.11 U	mg/kg	.5	.12 U	mg/kg	.5

U = NOT DETECTED J = ESTIMATED VALUE
 UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
 R = RESULT IS REJECTED AND UNUSABLE

NAS CECIL FIELD -- FACILITY 616
 SOIL -- TRPH -- REQ.NO. 10025

Lab Sample Number:	A6B0701380		A6B0701380		JR88982		JR88981		
Site	CECILBRAC2		CECILBRAC2		BRAC		BRAC		
Locator	75S00101		75S00201		75S00301		75B00101		
Collect Date:	06-FEB-96		06-FEB-96		29-JAN-98		29-JAN-98		
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL

TPH												
Total petroleum hydrocarbons	7000	mg/kg	600	13	mg/kg	12	-		-			
TPH C8-C40	-			-			660	mg/kg	78	88	mg/kg	7.5

U = NOT DETECTED J = ESTIMATED VALUE
 UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
 R = RESULT IS REJECTED AND UNUSABLE

