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NAS CECIL FIELD
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SAMPLING AND ANALYSIS OUTLINE AND REPORT MAIN BASE AREA 12 BASE
REALIGNMENT AND CLOSURE NAS CECIL FIELD FL
1/1/1999
HARDING LAWSON ASSOCIATES

SAMPLING AND ANALYSIS OUTLINE AND REPORT

MAIN BASE AREA 12

BASE REALIGNMENT AND CLOSURE

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

Unit Identification No. N60200

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

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GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
BCT	BRAC cleanup team
BRAC	Base Realignment and Closure
EBS	environmental baseline survey
FDEP	Florida Department of Environmental Protection
MB12	Main Base Area 12
NAS	Naval Air Station
PRE	preliminary risk evaluation
SCTL	soil cleanup target level
TRPH	total recoverable petroleum hydrocarbons
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

1.0 INTRODUCTION

Main Base Area 12 (MB12) is the site designation assigned to the area surrounding the south end of the north-south runway at Naval Air Station (NAS) Cecil Field, Jacksonville, Florida. The perimeter of MB12 is formed by Perimeter Road to the south and Sal Taylor Creek to the north (Figure 1). No buildings were included in the survey of Open Area MB12.

The Environmental Baseline Survey (EBS) Report (ABB Environmental Services, Inc. [ABB-ES], 1994a) documents the presence of four areas of environmental interest: a cleared area of pine forest, a burned out frame of a wood shelter, a cleared area with minor amounts of debris, and a corroded 55-gallon drum. Of these four areas, further assessment was recommended for the burnt structure and the corroded 55-gallon drum.

The EBS Report also noted two areas of potential environmental concern at MB12: fuel releases from the runway and residual petroleum contamination from fuel spills in Sal Taylor Creek.

The EBS Report recommended that the four areas of environmental interest be classified as Gray and the remainder of MB12 be classified as White.

Harding Lawson Associates conducted an additional site walkover of MB12 in April 1997. Four areas of interest were noted during the walkover: two depressions containing stressed vegetation and two oil-filled switch gears, one with an adjacent transformer and underground storage tank (UST) (Figure 1). A total of four surface soil samples was recommended for collection from the four areas of interest and analysis for full scan organics and organics and total recoverable petroleum hydrocarbons (TRPH) (at the two oil-filled switch gear locations only).

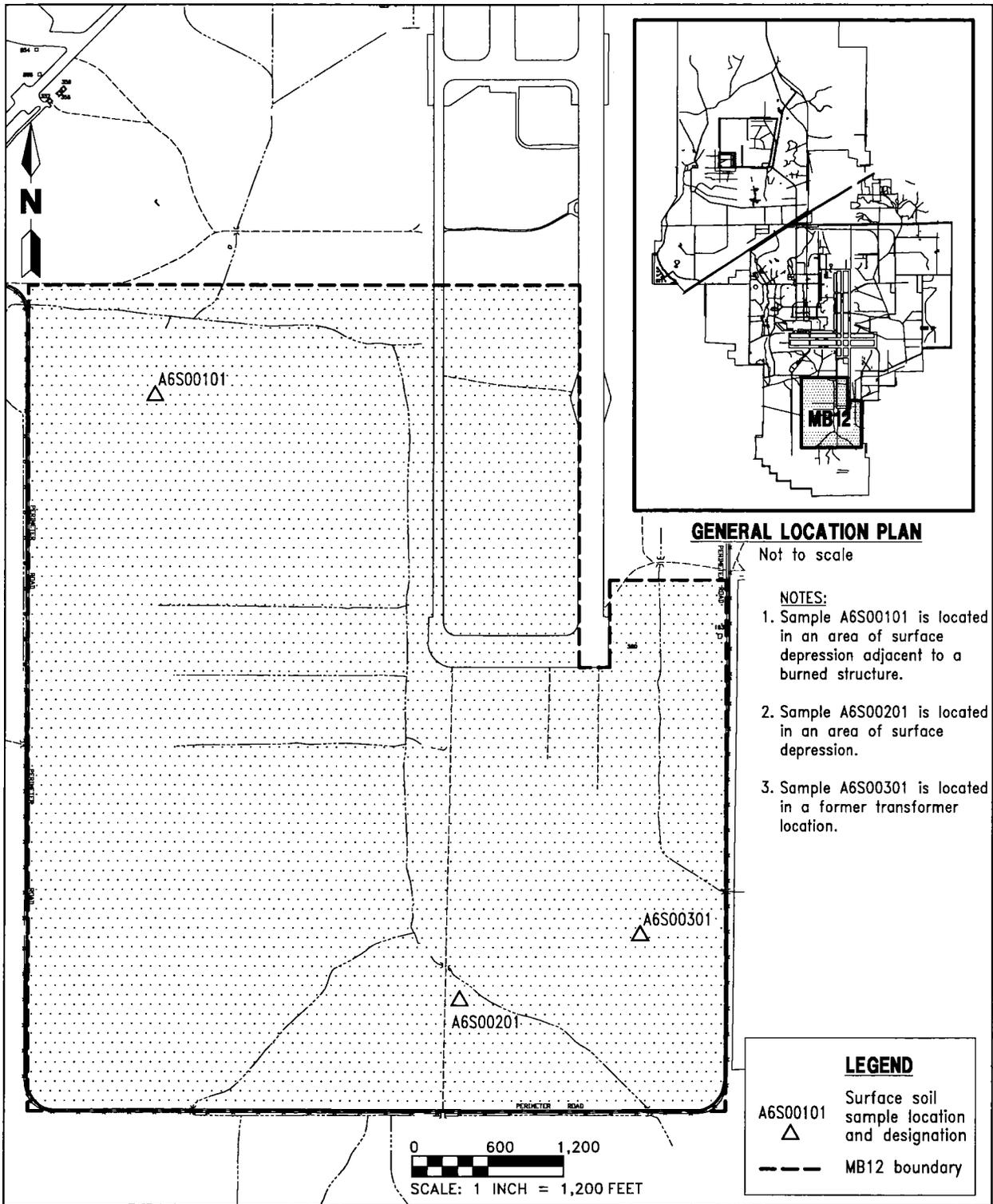
2.0 SAMPLING AND ANALYSIS OUTLINE

The Base Realignment and Closure (BRAC) cleanup team (BCT) reviewed the available data and discussed the strategy for Phase II Sampling and Analysis of MB12 during the BCT meeting on July 16, 1997. The BCT's consensus reached at this meeting on the strategy for assessment involved collection and analysis of three surface soil samples from the areas of interest. One transformer, located at a UST site, was empty and no sample was collected at that location.

Sample collection techniques, quality assurance objectives, quality control requirements, and sample handling and shipping procedures are outlined in the BRAC Project Operations Plan (ABB-ES, 1994b).

3.0 PHASE II INVESTIGATION AND PRELIMINARY RISK EVALUATION

Three surface soil samples were collected and submitted to Environmental Conservation Laboratories for full target compound list and target analyte list and TRPH analysis. A preliminary risk evaluation (PRE), based on the analytical



**FIGURE 1
 MAIN BASE OPEN AREA 12 (MB12)
 SAMPLE LOCATION PLAN**



**SAMPLING AND ANALYSIS
 OUTLINE AND REPORT**

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

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results, was conducted to assess potential risks to human and ecological receptors posed by contaminants in surface soil. 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), a 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).

Inorganic analytes were compared to NAS Cecil Field screening criteria for inorganics established by the NAS Cecil Field partnering team. The NAS Cecil Field screening criteria were 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 is conducted for inorganic analytes detected at concentrations below NAS Cecil Field screening criteria for inorganics.

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 groundwater or surface soil (Appendix A). Risk-based screening values were obtained from USEPA Region III Risk-Based Concentrations (USEPA, 1998) 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.

Four volatile organic compounds (VOCs) and four pesticides were detected but their concentrations did not exceed regulatory screening criteria. Nine inorganic analytes were also detected in the surface soil samples. Calcium was the only inorganic analyte detected at a concentration in excess of NAS Cecil Field inorganic background data set values. However, no SCTL is available for calcium. No ecological screening criteria were exceeded; therefore, no further ecological risk evaluation is required.

4.0 CONCLUSIONS AND RECOMMENDATIONS

No evidence of release or disposal of hazardous materials was observed or documented within MB12. Several VOCs, pesticides, and inorganics were detected in the surface soil samples collected during the Phase II evaluation. The detected concentrations of all VOCs, pesticides, and inorganics (with the exception of calcium) are below the most conservative human health and ecological screening criteria used in the evaluation and do not represent a hazard to human health or the environment. Therefore, the color classification for MB12 should be changed from 7/Gray to Light Green, to indicate that VOCs and pesticides have been detected but do not require remedial action.

5.0 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 (SOUTHNAVFACENGCOC), North Charleston, South Carolina (November).
- ABB-ES. 1994b. *Project Operations Plan for Cecil Field and Health and Safety Plan*. Prepared for SOUTHNAVFACENGCOC, North Charleston, South Carolina (December).
- ABB-ES. 1995. Minutes of September 25, 1995, conference call to discuss preliminary risk evaluations.
- Florida Department of Environmental Protection. 1998. *Brownfields Cleanup Criteria Rule: Chapter 62-785, Florida Administrative Code*. Tallahassee, Florida.
- Hoaglin, D.C., F. Mosteller, and J.W. Tukey. 1983. *Understanding Robust and Exploratory Data Analysis*. New York: John Wiley and Sons, Inc.
- U.S. Environmental Protection Agency (USEPA). 1994. Memorandum from USEPA Region IV. Subject: "Amended Guidance on Preliminary Risk Evaluations (PREs) for the Purpose of Reaching a Finding of Suitability to Lease (FOSL)." Atlanta, Georgia (December 20).
- USEPA. 1995. *Supplemental Guidance to RAGS*. Region IV bulletins. USEPA Region IV Waste Management Division. Atlanta, Georgia.
- USEPA. 1998. *Risk-Based Concentration Table*. Region III. Philadelphia, Pennsylvania.

APPENDIX A

LABORATORY ANALYTICAL DATA

**BRAC Preliminary Risk Evaluation Table for Analytes Detected in Surface Soil
Main Base Open Area 12
Naval Air Station Cecil Field**

Analyte¹	Samples			Calculated Risk Values²				
	A6S00101	A6S00201	A6S00301	BKGRD	SCTL	RBC(R)	ELCR	HQ
Acetone	0.006	0.004	0.016		770	7800	n	
Carbon disulfide	0.009				200	7800	n	
Methylene chloride	0.006	0.008	0.008		16	85	c	
Tetrachloroethene	0.014	0.013	0.013		10	12	c	
Heptachlor epoxide		0.0074			0.1	0.07	c	
Methoxychlor	0.003				380	390	n	
alpha-Chlordane			0.01		3	0.49	c	
gamma-Chlordane			0.014		3	1.8	c	
Aluminum	1500	790	2300	4432.5	72000	78000	n	
*Calcium	38	56	110	9.44				
Chromium	1.4	1.2	3	7.75	290	390	n	
Iron	520	43	62	1486	23000	23000	n	
Lead	1.4	1.8		196.9	500			
Magnesium	34			328.65				
Manganese	4.6			21.95	1600	1600	n	
Mercury		0.023	0.014	0.16	3.7	23	n	
Vanadium	1.6			6.3	15	550	n	

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)

HQ = calculated Hazard Quotient for non-carcinogenic analytes (HQ=detected concentration/RBC(R))

NAS CECIL FIELD -- MAIN BASE OPEN AREA 12
 SURFACE SOIL -- ANALYTICAL DATA -- REQUEST NO. 10623

Lab Sample Number:	JR38467		JR38468		JR38469	
Site	BRAC		BRAC		BRAC	
Locator	A6S00101		A6S00201		A6S00301	
Collect Date:	27-OCT-98		27-OCT-98		27-OCT-98	
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL

BRAC VOLATILES

1,1,1-Trichloroethane	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
1,1,2,2-Tetrachloroethane	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
1,1,2-Trichloroethane	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
1,1-Dichloroethane	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
1,1-Dichloroethene	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
1,2-Dichloroethane	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
1,2-Dichloropropane	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Benzene	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Bromodichloromethane	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Bromoform	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Bromomethane	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Carbon tetrachloride	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Chlorobenzene	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Chloroethane	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Chloroform	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Chloromethane	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Dibromochloromethane	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Ethyl benzene	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Methyl chloride	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Tetrachloroethene	14	ug/kg	1	13	ug/kg	1	13	ug/kg	1
Toluene	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Trichloroethene	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Vinyl chloride	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
cis-1,3-Dichloropropene	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
m,p-Xylene	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
o-Xylene	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
trans-1,2-Dichloroethene	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
trans-1,3-Dichloropropene	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1

BRAC SEMIVOLATILES

Phenol	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
bis(2-Chloroethyl)ether	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
1,3-Dichlorobenzene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
1,4-Dichlorobenzene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
1,2-Dichlorobenzene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
N-Nitroso-di-n-propylamine	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Nitrobenzene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Isophorone	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
2-Methylphenol	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
2-Nitrophenol	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
2,4-Dimethylphenol	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
bis(2-Chloroethoxy) methane	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
2,4-Dichlorophenol	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
1,2,4-Trichlorobenzene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Naphthalene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Hexachlorobutadiene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Hexachlorocyclopentadiene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Hexachloroethane	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
4-Chloro-3-methylphenol	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
2-Methylnaphthalene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190

NAS CECIL FIELD -- MAIN BASE OPEN AREA 12
SURFACE SOIL -- ANALYTICAL DATA -- REQUEST NO. 10623

Lab Sample Number: Site Locator Collect Date:	JR38467			JR38468			JR38469		
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL
2,4,6-Trichlorophenol	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
2-Chloronaphthalene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Dimethylphthalate	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Acenaphthylene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
2,4-Dinitrophenol	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
3- & 4-Methylphenol (2)	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
4-Nitrophenol	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
2,4-Dinitrotoluene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Diethylphthalate	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
4-Chlorophenyl-phenylether	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Fluorene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
4,6-Dinitro-2-methylphenol	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
4-Bromophenyl-phenylether	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Hexachlorobenzene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Pentachlorophenol	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Phenanthrene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Pyrene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Anthracene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Acenaphthene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Di-n-butylphthalate	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Fluoranthene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
3,3-Dichlorobenzidine	700 U	ug/kg	700	740 U	ug/kg	740	770 U	ug/kg	770
Benzo (a) anthracene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Carbazole	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Chrysene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
bis(2-Ethylhexyl) phthalate	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Di-n-octylphthalate	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Benzo (b) fluoranthene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Benzo (k) fluoranthene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Benzo (a) pyrene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Indeno (1,2,3-cd) pyrene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Dibenzo (a,h) anthracene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Benzo (g,h,i) perylene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
2,6-Dinitrotoluene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
4-Chloroaniline	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
2-Nitroaniline	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
3-Nitroaniline	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
4-Nitroaniline	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
BRAC PESTICIDES/PCBS									
alpha-BHC	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	2 U	ug/kg	2
beta-BHC	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	2 U	ug/kg	2
gamma-BHC (Lindane)	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	1.9 U	ug/kg	1.9
Heptachlor	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	2 U	ug/kg	2
Aldrin	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	1.9 U	ug/kg	1.9
Heptachlor epoxide	1.8 U	ug/kg	1.8	7.4 U	ug/kg	1.9	1.9 U	ug/kg	1.9
Endosulfan I	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	2 U	ug/kg	2
Dieldrin	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	2 U	ug/kg	2
4,4-DDE	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	2 U	ug/kg	2
Endrin	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	2 U	ug/kg	2
Endosulfan II	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	2 U	ug/kg	2
4,4-DDD	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	1.9 U	ug/kg	1.9

NAS CECIL FIELD -- MAIN BASE OPEN AREA 12
SURFACE SOIL -- ANALYTICAL DATA -- REQUEST NO. 10623

Lab Sample Number:	JR38467	JR38468	JR38469
Site	BRAC	BRAC	BRAC
Locator	A6S00101	A6S00201	A6S00301
Collect Date:	27-OCT-98	27-OCT-98	27-OCT-98

	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL
Endosulfan sulfate	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	1.9 U	ug/kg	1.9
4,4-DDT	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	2 U	ug/kg	2
Methoxychlor	3 J	ug/kg	3	3 U	ug/kg	3	3 U	ug/kg	3
Endrin ketone	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	1.9 U	ug/kg	1.9
Endrin aldehyde	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	1.9 U	ug/kg	1.9
alpha-Chlordane	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	10	ug/kg	1.9
gamma-Chlordane	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	14	ug/kg	2
Toxaphene	70 U	ug/kg	70	74 U	ug/kg	74	77 U	ug/kg	77
Aroclor-1221	35 U	ug/kg	35	37 U	ug/kg	37	38 U	ug/kg	38
Aroclor-1232	35 U	ug/kg	35	37 U	ug/kg	37	38 U	ug/kg	38
Aroclor-1248	35 U	ug/kg	35	37 U	ug/kg	37	38 U	ug/kg	38
Aroclor-1254	35 U	ug/kg	35	37 U	ug/kg	37	38 U	ug/kg	38
Aroclor-1260	35 U	ug/kg	35	37 U	ug/kg	37	38 U	ug/kg	38
Aroclor-1016/1242	35 U	ug/kg	35	37 U	ug/kg	37	38 U	ug/kg	38
CLP METALS AND CYANIDE									
Aluminum	1500	mg/kg	21	790	mg/kg	22	2300	mg/kg	46
Antimony	2 U	mg/kg	2	2 U	mg/kg	2	2 U	mg/kg	2
Arsenic	.5 U	mg/kg	.5	.6 U	mg/kg	.6	1 U	mg/kg	1
Barium	21 U	mg/kg	21	22 U	mg/kg	22	46 U	mg/kg	46
Beryllium	1 U	mg/kg	1	1 U	mg/kg	1	2 U	mg/kg	2
Cadmium	1 U	mg/kg	1	1 U	mg/kg	1	2 U	mg/kg	2
Calcium	38	mg/kg	26	56	mg/kg	28	110	mg/kg	29
Chromium	1.4	mg/kg	1	1.2	mg/kg	1	3	mg/kg	2
Cobalt	5 U	mg/kg	5	6 U	mg/kg	6	11 U	mg/kg	11
Copper	5 U	mg/kg	5	6 U	mg/kg	6	11 U	mg/kg	11
Iron	520	mg/kg	10	43	mg/kg	11	62	mg/kg	23
Lead	1.4	mg/kg	1	1.8	mg/kg	1	2 U	mg/kg	2
Magnesium	34	mg/kg	26	28 U	mg/kg	28	57 U	mg/kg	57
Manganese	4.6	mg/kg	1	1 U	mg/kg	1	2 U	mg/kg	2
Mercury	.01 U	mg/kg	.01	.023	mg/kg	.01	.014 J	mg/kg	.01
Nickel	5 U	mg/kg	5	6 U	mg/kg	6	11 U	mg/kg	11
Potassium	26 U	mg/kg	26	28 U	mg/kg	28	29 U	mg/kg	29
Selenium	2 U	mg/kg	2	2 U	mg/kg	2	2 U	mg/kg	2
Silver	2 U	mg/kg	2	2 U	mg/kg	2	4 U	mg/kg	4
Sodium	26 U	mg/kg	26	28 U	mg/kg	28	29 U	mg/kg	29
Thallium	1 U	mg/kg	1	1 U	mg/kg	1	1 U	mg/kg	1
Vanadium	1.6	mg/kg	1	1 U	mg/kg	1	2 U	mg/kg	2
Zinc	5 U	mg/kg	5	6 U	mg/kg	6	11 U	mg/kg	11
Cyanide	-			-			-		

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

SAMPLING AND ANALYSIS OUTLINE AND REPORT

MAIN BASE AREA 12

BASE REALIGNMENT AND CLOSURE

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

Unit Identification No. N60200

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

Prepared by:

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

Prepared for:

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Naval Facilities Engineering Command
2155 Eagle Drive
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Scott Glass, Code 18B12, BRAC Environmental Coordinator

April 1999

Revision 1.0

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Naval Air Station Cecil Field
Jacksonville, Florida

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Sampling and Analysis Outline and Report
Main Base Area 12
Base Realignment and Closure
Naval Air Station Cecil Field
Jacksonville, Florida

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GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
BCT	BRAC cleanup team
BRAC	Base Realignment and Closure
EBS	environmental baseline survey
FDEP	Florida Department of Environmental Protection
MB12	Main Base Area 12
NAS	Naval Air Station
PRE	preliminary risk evaluation
SCTL	soil cleanup target level
TRPH	total recoverable petroleum hydrocarbons
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

1.0 INTRODUCTION

Main Base Area 12 (MB12) is the site designation assigned to the area surrounding the south end of the north-south runway at Naval Air Station (NAS) Cecil Field, Jacksonville, Florida. The perimeter of MB12 is formed by Perimeter Road to the south and Sal Taylor Creek to the north (Figure 1). No buildings were included in the survey of Open Area MB12.

The Environmental Baseline Survey (EBS) Report (ABB Environmental Services, Inc. [ABB-ES], 1994a) documents the presence of four areas of potential environmental concern: a cleared area of pine forest, a burned out frame of a wood shelter, a cleared area with minor amounts of debris, and a corroded 55-gallon drum. Of these four areas, further assessment was recommended for the burnt structure and the corroded 55-gallon drum. The EBS Report also noted two additional areas of potential environmental concern at MB12, related to potential fuel releases from the runway and residual petroleum contamination from fuel spills in Sal Taylor Creek. The EBS Report recommended that the four areas of potential environmental concern be classified as Gray and the remainder of MB12 be classified as White.

Harding Lawson Associates conducted an additional site walkover of MB12 in April 1997. Four areas were noted during the walkover: two shallow depressions containing stressed vegetation and two oil-filled switches. One of the oil-filled switches was located near a transformer and underground storage tank (UST) (Figure 1). Four surface soil samples were recommended for collection and analysis for full suite of TCL organics and TAL inorganics. Analysis for total recoverable petroleum hydrocarbons (TRPH) was also recommended (at the two oil-filled switch gear locations).

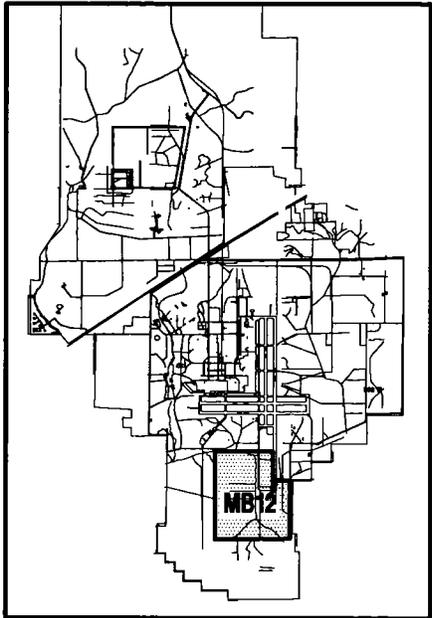
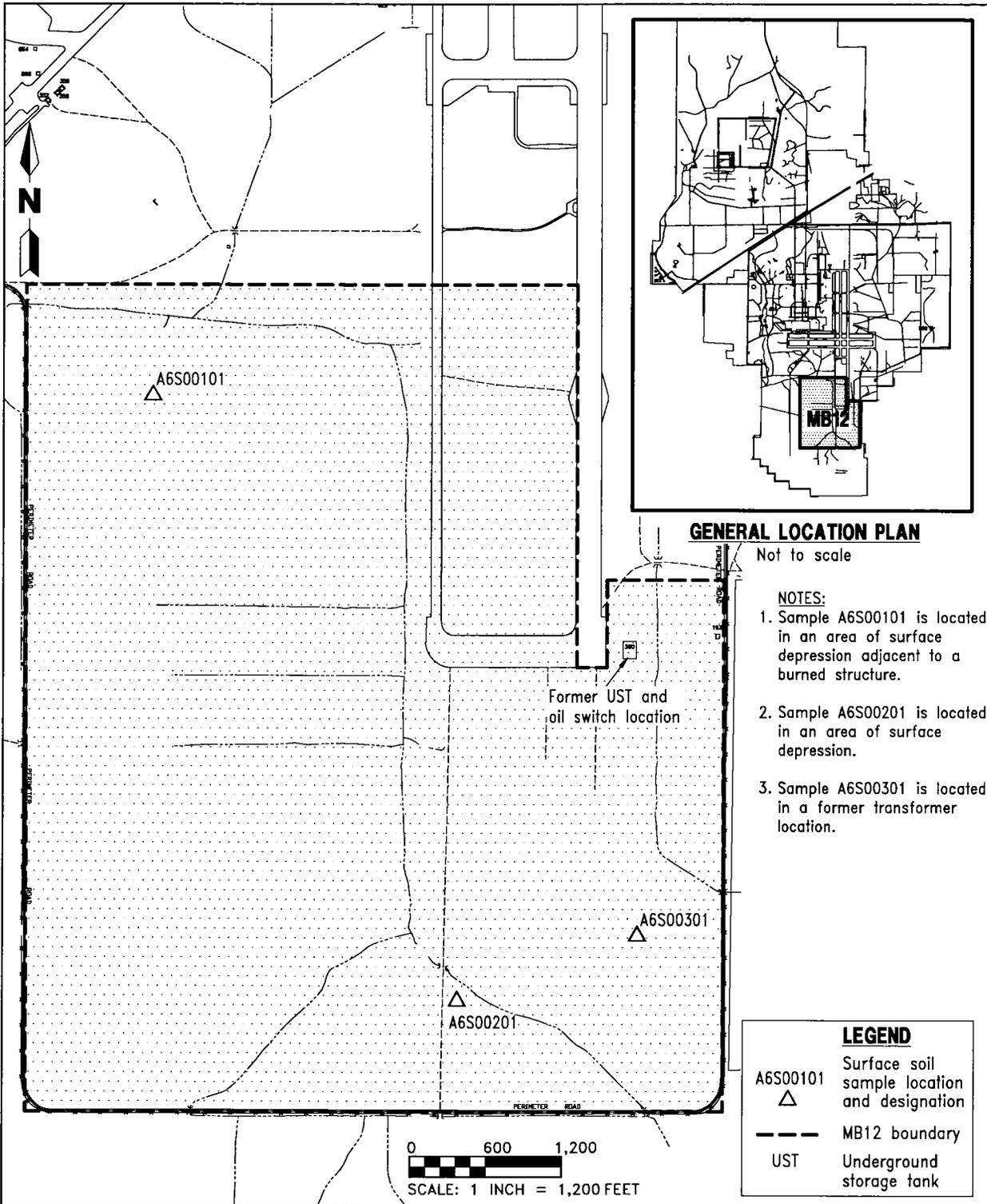
2.0 SAMPLING AND ANALYSIS OUTLINE

The Base Realignment and Closure (BRAC) cleanup team (BCT) reviewed the available data and discussed the strategy for Phase II Sampling and Analysis of MB12 during the BCT meeting on July 16, 1997. The BCT's consensus reached at this meeting on the strategy for assessment involved collection and analysis of four soil samples from the areas of concern noted during the HLA walkover.

Sample collection techniques, quality assurance objectives, quality control requirements, and sample handling and shipping procedures are outlined in the BRAC Project Operations Plan (ABB-ES, 1994b).

3.0 PHASE II INVESTIGATION AND PRELIMINARY RISK EVALUATION

Three surface soil samples were collected and submitted to Environmental Conservation Laboratories for full target compound list and target analyte list analysis. The surface soil samples scheduled for collection near the oil-filled switch adjacent to runway 36R was not collected due to changes in site conditions. The UST at this location had been removed, and a clean closure



GENERAL LOCATION PLAN

Not to scale

NOTES:

1. Sample A6S00101 is located in an area of surface depression adjacent to a burned structure.
2. Sample A6S00201 is located in an area of surface depression.
3. Sample A6S00301 is located in a former transformer location.

LEGEND

- A6S00101 Surface soil sample location and designation
- MB12 boundary
- UST Underground storage tank

**FIGURE 1
MAIN BASE OPEN AREA 12 (MB12)
SAMPLE LOCATION PLAN**



**SAMPLING AND ANALYSIS
OUTLINE AND REPORT**

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

report was submitted prior to the field sampling effort. In addition, the transformer and oil switch were replaced with new equipment, and no stained soil or stressed vegetation were noted. A preliminary risk evaluation (PRE), based on the analytical results, was conducted to assess potential risks to human and ecological receptors posed by contaminants in surface soil. 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), a 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).

Inorganic analytes were compared to NAS Cecil Field screening criteria for inorganics established by the NAS Cecil Field partnering team. The NAS Cecil Field screening criteria were 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 is conducted for inorganic analytes detected at concentrations below NAS Cecil Field screening criteria for inorganics.

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 groundwater or surface soil (Appendix A). Risk-based screening values were obtained from USEPA Region III Risk-Based Concentrations (USEPA, 1998) 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.

Four volatile organic compounds (VOCs) and four pesticides were detected but their concentrations did not exceed regulatory screening criteria. Nine inorganic analytes were also detected in the surface soil samples. Calcium was the only inorganic analyte detected at a concentration in excess of NAS Cecil Field inorganic background data set values. However, no SCTL is available for calcium. No human health or ecological screening criteria were exceeded; therefore, no further ecological risk evaluation is required.

4.0 CONCLUSIONS AND RECOMMENDATIONS

No evidence of release or disposal of hazardous materials was observed or documented within MB12. Several VOCs, pesticides, and inorganics were detected in the surface soil samples collected during the Phase II evaluation. The detected concentrations of all VOCs, pesticides, and inorganics are below the most conservative human health and ecological screening criteria used in the evaluation and do not represent a hazard to human health or the environment. Therefore, the color classification for the sampled areas within MB12 should be changed from 7/Gray to Light Green, to indicate that VOCs and pesticides have been detected, but at concentrations which do not require remedial action. No environmental concerns have been identified for the remainder of MB12; therefore, it should be reclassified to 1/White.

5.0 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 (SOUTHNAVFACENGCOC), North Charleston, South Carolina (November).
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- ABB-ES. 1995. Minutes of September 25, 1995, conference call to discuss preliminary risk evaluations.
- Florida Department of Environmental Protection. 1998. *Brownfields Cleanup Criteria Rule: Chapter 62-785, Florida Administrative Code*. Tallahassee, Florida.
- Hoaglin, D.C., F. Mosteller, and J.W. Tukey. 1983. *Understanding Robust and Exploratory Data Analysis*. New York: John Wiley and Sons, Inc.
- U.S. Environmental Protection Agency (USEPA). 1994. Memorandum from USEPA Region IV. Subject: "Amended Guidance on Preliminary Risk Evaluations (PREs) for the Purpose of Reaching a Finding of Suitability to Lease (FOSL)." Atlanta, Georgia (December 20).
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- USEPA. 1998. *Risk-Based Concentration Table*. Region III. Philadelphia, Pennsylvania.

APPENDIX A

**PRELIMINARY RISK EVALUATION TABLE
AND LABORATORY ANALYTICAL DATA**

**BRAC Preliminary Risk Evaluation Table for Analytes Detected in Surface Soil
Main Base Open Area 12
Naval Air Station Cecil Field**

Analyte¹	Samples			Calculated Risk Values²				
	A6S00101	A6S00201	A6S00301	BKGRD	SCTL	RBC(R)	ELCR	HQ
Acetone	0.006	0.004	0.016		770	7800	n	
Carbon disulfide	0.009				200	7800	n	
Methylene chloride	0.006	0.008	0.008		16	85	c	
Tetrachloroethene	0.014	0.013	0.013		10	12	c	
Heptachlor epoxide		0.0074			0.1	0.07	c	
Methoxychlor	0.003				380	390	n	
alpha-Chlordane			0.01		3	0.49	c	
gamma-Chlordane			0.014		3	1.8	c	
Aluminum	1500	790	2300	4432.5	72000	78000	n	
*Calcium	38	56	110	9.44				
Chromium	1.4	1.2	3	7.75	290	390	n	
Iron	520	43	62	1486	23000	23000	n	
Lead	1.4	1.8		196.9	500			
Magnesium	34			328.65				
Manganese	4.6			21.95	1600	1600	n	
Mercury		0.023	0.014	0.16	3.7	23	n	
Vanadium	1.6			6.3	15	550	n	

Notes:

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

²ELCR and HQ 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)

HQ = calculated Hazard Quotient for non-carcinogenic analytes (HQ=detected concentration/RBC(R))

NAS CECIL FIELD -- MAIN BASE OPEN AREA 12
SURFACE SOIL -- ANALYTICAL DATA -- REQUEST NO. 10623

Lab Sample Number:	JR38467		JR38468		JR38469				
Site	BRAC		BRAC		BRAC				
Locator	A6S00101		A6S00201		A6S00301				
Collect Date:	27-OCT-98		27-OCT-98		27-OCT-98				
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL

BRAC VOLATILES

1,1,1-Trichloroethane	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
1,1,2,2-Tetrachloroethane	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
1,1,2-Trichloroethane	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
1,1-Dichloroethane	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
1,1-Dichloroethene	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
1,2-Dichloroethane	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
1,2-Dichloropropane	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Benzene	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Bromodichloromethane	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Bromoform	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Bromomethane	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Carbon tetrachloride	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Chlorobenzene	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Chloroethane	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Chloroform	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Chloromethane	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Dibromochloromethane	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Ethyl benzene	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Methyl chloride	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Tetrachloroethene	14	ug/kg	1	13	ug/kg	1	13	ug/kg	1
Toluene	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Trichloroethene	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
Vinyl chloride	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
cis-1,3-Dichloropropene	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
m,p-Xylene	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
o-Xylene	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
trans-1,2-Dichloroethene	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1
trans-1,3-Dichloropropene	1 U	ug/kg	1	1 U	ug/kg	1	1 U	ug/kg	1

BRAC SEMIVOLATILES

Phenol	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
bis(2-Chloroethyl) ether	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
1,3-Dichlorobenzene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
1,4-Dichlorobenzene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
1,2-Dichlorobenzene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
N-Nitroso-di-n-propylamine	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Nitrobenzene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Isophorone	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
2-Methylphenol	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
2-Nitrophenol	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
2,4-Dimethylphenol	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
bis(2-Chloroethoxy) methane	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
2,4-Dichlorophenol	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
1,2,4-Trichlorobenzene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Naphthalene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Hexachlorobutadiene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Hexachlorocyclopentadiene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Hexachloroethane	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
4-Chloro-3-methylphenol	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
2-Methylnaphthalene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190

NAS CECIL FIELD -- MAIN BASE OPEN AREA 12
 SURFACE SOIL -- ANALYTICAL DATA -- REQUEST NO. 10623

Lab Sample Number:
 Site
 Locator
 Collect Date:

JR38467
 BRAC
 A6S00101
 27-OCT-98

JR38468
 BRAC
 A6S00201
 27-OCT-98

JR38469
 BRAC
 A6S00301
 27-OCT-98

VALUE QUAL UNITS DL VALUE QUAL UNITS DL VALUE QUAL UNITS DL

2,4,6-Trichlorophenol	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
2-Chloronaphthalene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Dimethylphthalate	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Acenaphthylene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
2,4-Dinitrophenol	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
3- & 4-Methylphenol (2)	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
4-Nitrophenol	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
2,4-Dinitrotoluene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Diethylphthalate	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
4-Chlorophenyl-phenylether	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Fluorene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
4,6-Dinitro-2-methylphenol	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
4-Bromophenyl-phenylether	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Hexachlorobenzene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Pentachlorophenol	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Phenanthrene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Pyrene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Anthracene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Acenaphthene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Di-n-butylphthalate	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Fluoranthene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
3,3-Dichlorobenzidine	700 U	ug/kg	700	740 U	ug/kg	740	770 U	ug/kg	770
Benzo (a) anthracene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Carbazole	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Chrysene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
bis(2-Ethylhexyl) phthalate	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Di-n-octylphthalate	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Benzo (b) fluoranthene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Benzo (k) fluoranthene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Benzo (a) pyrene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Indeno (1,2,3-cd) pyrene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Dibenzo (a,h) anthracene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
Benzo (g,h,i) perylene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
2,6-Dinitrotoluene	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
4-Chloroaniline	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
2-Nitroaniline	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
3-Nitroaniline	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190
4-Nitroaniline	180 U	ug/kg	180	190 U	ug/kg	190	190 U	ug/kg	190

BRAC PESTICIDES/PCBS

alpha-BHC	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	2 U	ug/kg	2
beta-BHC	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	2 U	ug/kg	2
gamma-BHC (Lindane)	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	1.9 U	ug/kg	1.9
Heptachlor	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	2 U	ug/kg	2
Aldrin	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	1.9 U	ug/kg	1.9
Heptachlor epoxide	1.8 U	ug/kg	1.8	7.4	ug/kg	1.9	1.9 U	ug/kg	1.9
Endosulfan I	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	2 U	ug/kg	2
Dieldrin	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	2 U	ug/kg	2
4,4-DDE	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	2 U	ug/kg	2
Endrin	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	2 U	ug/kg	2
Endosulfan II	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	2 U	ug/kg	2
4,4-DDD	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	1.9 U	ug/kg	1.9

NAS CECIL FIELD -- MAIN BASE OPEN AREA 12
SURFACE SOIL -- ANALYTICAL DATA -- REQUEST NO. 10623

Lab Sample Number: Site Locator Collect Date:	JR38467 BRAC A6S00101 27-OCT-98			JR38468 BRAC A6S00201 27-OCT-98			JR38469 BRAC A6S00301 27-OCT-98		
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL
Endosulfan sulfate	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	1.9 U	ug/kg	1.9
4,4-DDT	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	2 U	ug/kg	2
Methoxychlor	3 J	ug/kg	3	3 U	ug/kg	3	3 U	ug/kg	3
Endrin ketone	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	1.9 U	ug/kg	1.9
Endrin aldehyde	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	1.9 U	ug/kg	1.9
alpha-Chlordane	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	10	ug/kg	1.9
gamma-Chlordane	1.8 U	ug/kg	1.8	1.9 U	ug/kg	1.9	14	ug/kg	2
Toxaphene	70 U	ug/kg	70	74 U	ug/kg	74	77 U	ug/kg	77
Aroclor-1221	35 U	ug/kg	35	37 U	ug/kg	37	38 U	ug/kg	38
Aroclor-1232	35 U	ug/kg	35	37 U	ug/kg	37	38 U	ug/kg	38
Aroclor-1248	35 U	ug/kg	35	37 U	ug/kg	37	38 U	ug/kg	38
Aroclor-1254	35 U	ug/kg	35	37 U	ug/kg	37	38 U	ug/kg	38
Aroclor-1260	35 U	ug/kg	35	37 U	ug/kg	37	38 U	ug/kg	38
Aroclor-1016/1242	35 U	ug/kg	35	37 U	ug/kg	37	38 U	ug/kg	38
CLP METALS AND CYANIDE									
Aluminum	1500	mg/kg	21	790	mg/kg	22	2300	mg/kg	46
Antimony	2 U	mg/kg	2	2 U	mg/kg	2	2 U	mg/kg	2
Arsenic	.5 U	mg/kg	.5	.6 U	mg/kg	.6	1 U	mg/kg	1
Barium	21 U	mg/kg	21	22 U	mg/kg	22	46 U	mg/kg	46
Beryllium	1 U	mg/kg	1	1 U	mg/kg	1	2 U	mg/kg	2
Cadmium	1 U	mg/kg	1	1 U	mg/kg	1	2 U	mg/kg	2
Calcium	38	mg/kg	26	56	mg/kg	28	110	mg/kg	29
Chromium	1.4	mg/kg	1	1.2	mg/kg	1	3	mg/kg	2
Cobalt	5 U	mg/kg	5	6 U	mg/kg	6	11 U	mg/kg	11
Copper	5 U	mg/kg	5	6 U	mg/kg	6	11 U	mg/kg	11
Iron	520	mg/kg	10	43	mg/kg	11	62	mg/kg	23
Lead	1.4	mg/kg	1	1.8	mg/kg	1	2 U	mg/kg	2
Magnesium	34	mg/kg	26	28 U	mg/kg	28	57 U	mg/kg	57
Manganese	4.6	mg/kg	1	1 U	mg/kg	1	2 U	mg/kg	2
Mercury	.01 U	mg/kg	.01	.023	mg/kg	.01	.014 J	mg/kg	.01
Nickel	5 U	mg/kg	5	6 U	mg/kg	6	11 U	mg/kg	11
Potassium	26 U	mg/kg	26	28 U	mg/kg	28	29 U	mg/kg	29
Selenium	2 U	mg/kg	2	2 U	mg/kg	2	2 U	mg/kg	2
Silver	2 U	mg/kg	2	2 U	mg/kg	2	4 U	mg/kg	4
Sodium	26 U	mg/kg	26	28 U	mg/kg	28	29 U	mg/kg	29
Thallium	1 U	mg/kg	1	1 U	mg/kg	1	1 U	mg/kg	1
Vanadium	1.6	mg/kg	1	1 U	mg/kg	1	2 U	mg/kg	2
Zinc	5 U	mg/kg	5	6 U	mg/kg	6	11 U	mg/kg	11
Cyanide	-			-			-		

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