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NAS CECIL FIELD
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SAMPLING AND ANALYSIS REPORT FOR BUILDING 4 ZONE D INDUSTRIAL AND FLIGHT LINE AREA NAS CECIL FIELD FL

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HARDING LAWSON ASSOCIATES

rec'd 7/20/98

SAMPLING AND ANALYSIS REPORT

BUILDING 4

BASE REALIGNMENT AND CLOSURE

ZONE D, INDUSTRIAL AND FLIGHT LINE AREA

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Unit Identification Code: N60200

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GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
ELCR	excess lifetime cancer risk
FDEP	Florida Department of Environmental Protection
GGCs	groundwater guidance concentrations
HI	hazard index
HLA	Harding Lawson Associates
HQ	hazard quotient
$\mu g/\ell$	micrograms per liter
NAS	Naval Air Station
PRE	preliminary risk evaluation
RBC	risk-based concentration
SAO	sampling and analysis outline
USEPA	U.S. Environmental Protection Agency

1.0 INTRODUCTION

Harding Lawson Associates (HLA) (formerly ABB Environmental Services, Inc. ([ABB-ES]), under contract to the Southern Division, Naval Facilities Engineering Command, has completed the Phase II Sampling and Analysis program for Building 4 at Naval Air Station (NAS) Cecil Field. This report summarizes the related field operations, results, conclusions, and recommendations of the Phase II investigation.

Building 4 is an administration building, located on 3rd Street, between C Avenue and D Avenue. The building was formerly used as galley, and as a ceramic and woodworking hobby shop. Environmental concerns identified for the facility include potential groundwater impacts associated with past site activities. A Sampling and Analysis Outline (SAO) for the assessment of groundwater downgradient of Building 4, was prepared by ABB-ES (presently HLA) and approved by the Base Realignment and Closure cleanup team (ABB-ES, 1995b).

2.0 PHASE II INVESTIGATION

This Phase II investigation included the installation of one shallow groundwater monitoring well and collection and analysis of one groundwater sample. Field activities were undertaken in general conformance with the Project Operations Plan (ABB-ES, 1994a).

The groundwater monitoring well was installed southeast of Building 4, to a depth of 20 feet below land surface. One groundwater sample was collected and analyzed for the full Contract Laboratory program suite of target compound list organics and target analyte list inorganics. A site plan indicating the location of the monitoring well is presented on Figure 1. The soil boring log is included in Appendix A.

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 groundwater. 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, 1995a). Site background information and rationale for sample collection and analysis are detailed in the Environmental Baseline Survey Report (ABB-ES, 1994b) and the SAO (ABB-ES, 1995b).

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 groundwater. Risk-based screening

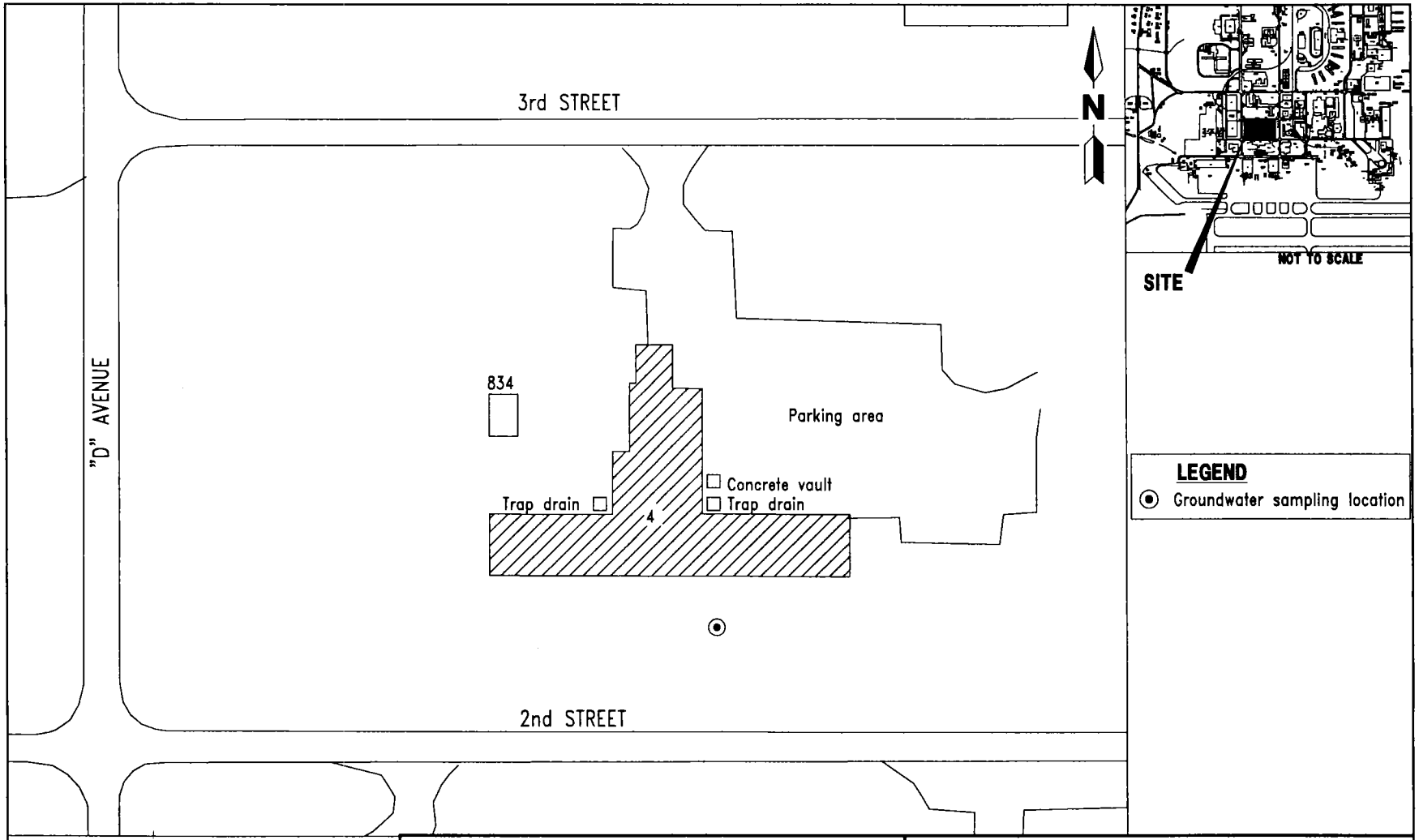

FIGURE 1
BUILDING 4
FLEET VS WING ADMINISTRATION OFFICE

PHASE II SAMPLING AND ANALYSIS REPORT

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

values were obtained from USEPA Region III Risk-Based Concentrations (RBCs) (USEPA, 1996) and FDEP Groundwater Guidance Concentrations (GGCs) (FDEP, 1994).

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.

Fifteen inorganic analytes and five pesticide compounds were detected in the groundwater sample collected in the study area. Heptachlor epoxide and alpha and gamma chlordane were detected at concentrations in excess of the RBCs for tap water, but did not approach FDEP GGCs values. Aluminum and iron were detected at concentrations exceeding FDEP GGCs. However, the GGC for aluminum and iron are based upon secondary water quality standards. Aluminum and iron are naturally occurring elements in groundwater at NAS Cecil Field and may not be site related.

A comparison between concentrations of detected analytes in groundwater, and RBCs for tap water and FDEP groundwater guidance concentrations, is presented in Appendix A. A cumulative noncancer risk or hazard index (HI) of less than 1 and an ELCR of 7×10^{-5} were calculated based upon RBCs for tap water.

3.2 ECOLOGICAL PRE. Potential exposure pathways and ecological habitat associated with Building 4 were characterized by ABB-ES (presently HLA) ecological risk assessors in June 1996. No complete exposure pathways to groundwater were identified within the study area. Therefore, no further ecological risk evaluation was conducted.

4.0 CONCLUSIONS AND RECOMMENDATIONS

One groundwater sample from the shallow surficial aquifer was collected at Building 4 and analyzed. Concentrations of detected compounds were compared to human health screening criteria. A cumulative noncancer risk or HI of less than 1 and an ELCR of 7×10^{-5} were calculated based upon RBCs for tap water. The ELCR is largely attributable to detections of compounds that are likely to be residuals of normal pesticide applications.

There is no potable water supply associated with Building 4; therefore, a groundwater-to-receptor pathway does not currently exist. No complete exposure pathways to ecological receptors were identified for groundwater in the study area. Therefore, no further ecological risk evaluation was conducted.

Based upon the information obtained for this assessment, the concentrations of analytes detected in groundwater at Building 4 do not represent a hazard to human health or the environment. Therefore, the color classification for Building 4 should be changed from Gray to Light Green.

REFERENCES

ABB Environmental Services, Inc. (ABB-ES). 1994a. *Project Operations Plan for Cecil Field and Health and Safety Plan*. Prepared for Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), North Charleston, South Carolina (December).

ABB-ES. 1994b. *Base Realignment and Closure Environmental Baseline Survey Report, Naval Air Station, Cecil Field, Jacksonville, Florida*. Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina (November).

ABB-ES. 1995a. Minutes of September 25, 1995, conference call to discuss preliminary risk evaluations.

ABB-ES. 1995b. *Sampling and Analysis Outline, Building 4, Base Realignment and Closure, Zone D, Industrial and Flightline Area, Group V, Naval Air Station, Cecil Field, Jacksonville, Florida*. Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina (July).

Florida Department of Environmental Protection (FDEP). 1994. *Groundwater Guidance Concentrations*. Bureau of Drinking Water and Groundwater Resources. Tallahassee, Florida (June).

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. *Region IV Waste Management Division Preliminary Risk Evaluation, Ecological Risk Assessment, Supplemental Guidance to RAGS*. Region IV Bulletin No. 1 (November).

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

APPENDIX A

SOIL BORING LOG AND PRELIMINARY RISK EVALUATION TABLE

TITLE: NAS Cecil Field BRAC	**LOG of WELL:** CEF-4-1S		**BORING NO.** CEF-4-1S
CLIENT: SOUTHNAVFACENGCOM			**PROJECT NO:** 02523-25
CONTRACTOR: Alliance Environmental, Inc.		**DATE STARTED:** 12-2-95	**COMPLTD:** 12-2-95
METHOD: Auger	**CASE SIZE:** 2 inches	**SCREEN INT.:** 9-19 FT.	**PROTECTION LEVEL:** D
TOC ELEV.: FT.	**MONITOR INST.:** PID	**TOT DPTH:** 20FT.	**DPTH TO ▽** 11.0 FT.
LOGGED BY: R. Holloway	**WELL DEVELOPMENT DATE:** 12/18/95		**SITE:** 42-4 Fleet Admin.

DEPTH FT.	INTERVAL SAMPLED	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				SILTY SAND (SM): 100%, light gray, quartz, fine grained, subrounded, well sorted.		SM	posthole	
							posthole	
				SANDY CLAY (CL): 100%, gray, soft, moist, moderate plasticity.		CL		
5		0					3,5,3,3	
		0					6,6,10,12	
		0		SAND with CLAY (SC): Sand, 60%, grayish brown, quartz, very fine grained, subrounded to subangular, well sorted, moist; Clay, 40%, light brownish gray, soft moist moderate plasticity, iron-staining apparent.		SC	12,10,9,9	
10		0				SM	7,5,6,7	▽
		0		SILTY SAND (SM): 100%, grayish brown, quartz, fine to very fine grained, subangular, well sorted.				
15								
20								
25								
30								

 ABB ENVIRONMENTAL SERVICES, INC.

BRAC Preliminary Risk Evaluation Table for Analytes Detected in Groundwater
Building 4, Naval Air Station Cecil Field

Analyte	Sample 42G00101	Screening Values FDEPGGC		RBC(T)	Calculated Risk Values ELCR	HI
Pesticides/PCBs						
4,4-DDD	0.013	0.1 c		0.28 c	5 E-8	
Endrin ketone	0.018			11 n		0.0
Heptachlor epoxide	0.069	0.2 p		0.0012 c	6 E-5	
alpha-Chlordane	0.35	2 p		0.052 c	7 E-6	
gamma-Chlordane	0.15	2 p		0.052 c	3 E-6	
Inorganic Analytes						
Aluminum	7680	200 s	*	37000 n		0.2
Barium	26.7	2000 p		2600 n		0.0
Calcium	3100					
Chromium	6.7	100 e		180 n		0.0
Copper	5.6	1000 s		1500 n		0.0
Iron	1420	300 s	*	11000 n		0.1
Lead	2.7	15 p				
Magnesium	1410					
Manganese	26.1	50 s		840 n		0.0
Nickel	4.1	100 p		730 n		0.0
Potassium	1680					
Sodium	5950	160000 p				
Vanadium	6.6	49 st		260 n		0.0
Zinc	17.6	5000 s		11000 n		0.0
Cyanide	3.4	200 p				
				Sum =	**7 E-5**	**0.5**

Notes:

All Analytes are reported in ug/l

Sample Suffixes indicate the following: F = filtered sample, DL = laboratory diluted sample, RE = laboratory re-extracted, D = field duplicate

FDEPGGC = FDEP Groundwater Guidance Concentration, June 1994

- * = values that exceed FDEPGGC
- p = primary standard (MCL)
- st = systemic toxicant
- t = organoleptic standard
- s = secondary standard (related to taste, odor, color, or other non-aesthetic effects)

RBC(T) = Risk-based Concentration (Tap Water), USEPA Region III, May 1996

- c = carcinogenic risk
- n = non-carcinogenic risk

ELCR = calculated excess lifetime cancer risk, based on RBC(T) values. (ELCR = detected concentration/RBC(T) * 10E-06)

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