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NAS CECIL FIELD, FL
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SAMPLING AND ANALYSIS REPORT FOR BUILDING 927 BASE REALIGNMENT AND
CLOSURE ZONE C DEVELOPED NON-INDUSTRIAL AREA GROUP 6 NAS CECIL FIELD FL
11/1/1997
ABB ENVIRONMENTAL SERVICES INC

SAMPLING AND ANALYSIS REPORT
BUILDING 927
BASE REALIGNMENT AND CLOSURE
ZONE C, DEVELOPED NONINDUSTRIAL AREA
GROUP VI

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Unit Identification Code: N60200

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

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November 1997

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GLOSSARY

ABB-ES	ABB Environmental Services, Inc
ELCR	excess lifetime cancer risk
FDEP	Florida Department of Environmental Protection
GGC	groundwater guidance concentrations
HQ	hazard quotient
HI	hazard index
mg/kg	milligrams per kilogram
PRE	preliminary risk evaluation
RBC	Risk-Based Concentrations
SAO	sampling and analysis outline
SCG	soil cleanup goal
TPH	total petroleum hydrocarbons
USEPA	U.S. Environmental Protection Agency

1.0 INTRODUCTION

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 927 at Naval Air Station Cecil Field. This report summarizes the related field operations, results, conclusions, and recommendations of the Phase II investigation.

Building 927 is a barracks for enlisted personnel. Potential environmental concerns documented for the facility involve an oil leak and stained soil, associated with air-conditioning equipment. A Sampling and Analysis Outline (SAO) for the assessment of surface soil was prepared by ABB-ES and approved by the Base Realignment and Closure cleanup team (ABB-ES, 1996). The results of the Phase II Sampling and Analysis program developed in the SAO are discussed below.

2.0 PHASE II INVESTIGATION

Field activities were undertaken in general conformance with the Project Operations Plan (ABB-ES, 1994a). The Phase II investigation included the collection and analysis of two surface soil samples. A general site plan indicating the sample locations is presented on Figure 1.

Both surface soil samples were collected at an interval of zero to 1 foot below land surface. One surface soil sample was collected near the north edge of the concrete pad in the area of soil stained by the leaking compressor. A second sample was collected northwest of the area of stained soil. Both samples were analyzed for the full Contract Laboratory program suite of target compound list organics, target analyte list inorganics, and total petroleum hydrocarbons (TPH).

3.0 PRELIMINARY RISK EVALUATION (PRE)

A PRE was conducted to assess potential risks to human and ecological receptors posed by contaminants in the soil. Primary exposure pathways were evaluated to determine which 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 "Amended Guidance on Preliminary Risk Evaluations (PREs) for the Purpose of Reaching a Finding of Suitability to Lease (FOSL)" (USEPA, 1994a), 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 Environmental Baseline Survey Report (ABB-ES, 1994b) and the SAO (ABB-ES, 1996).

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 soil. Risk-based screening values were obtained from USEPA Region III Risk-Based Concentrations (RBCs), (USEPA, 1996) and Soil Cleanup Goals (SCG) for Florida (FDEP, 1995). Most screening values published in the references listed above are based on toxicity

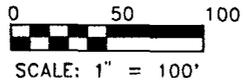
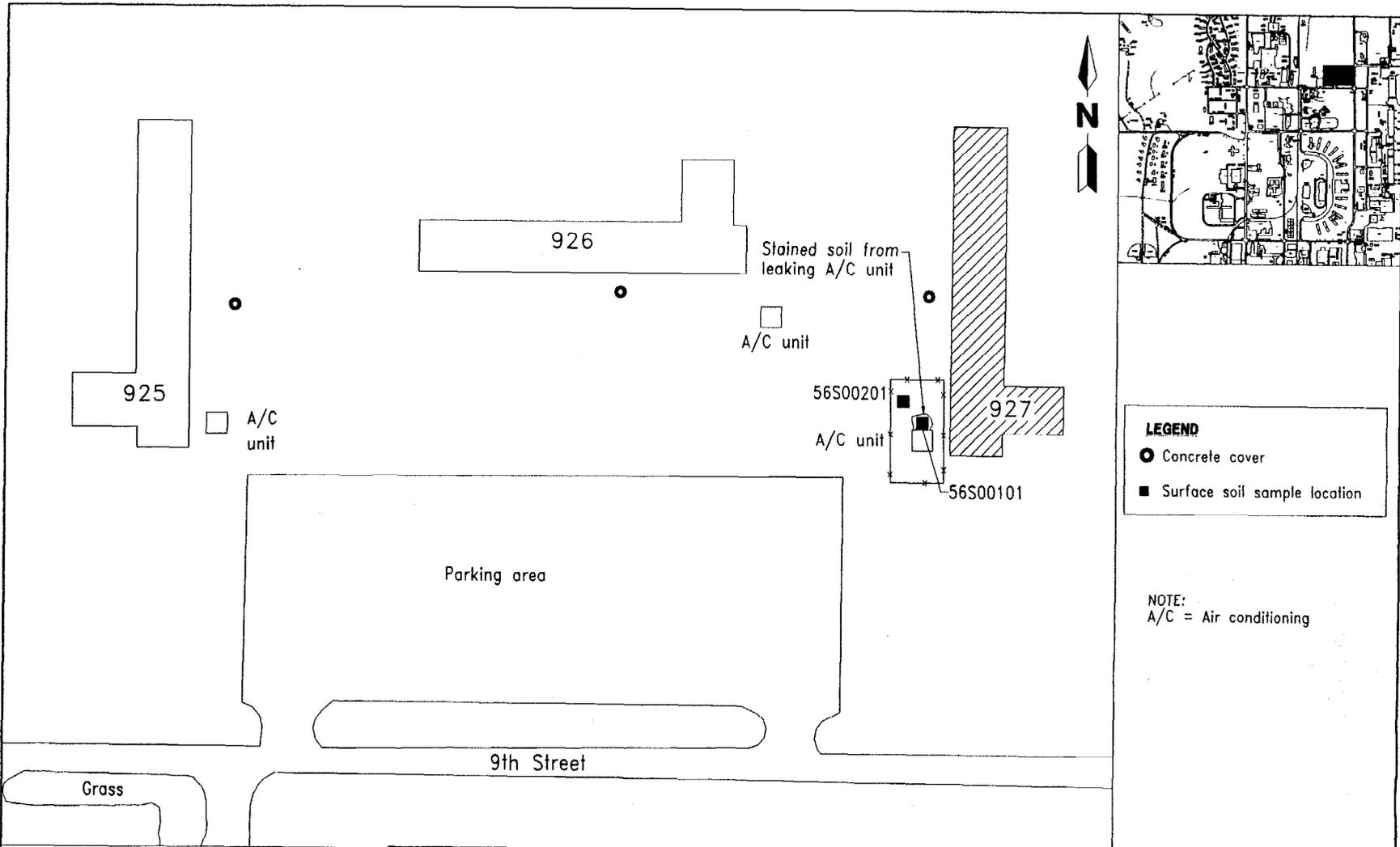
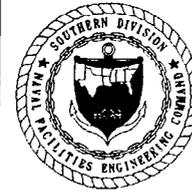


FIGURE 1
BUILDING 927
BARRACKS FOR ENLISTED PERSONNEL
SAMPLE LOCATION PLAN



PHASE II SAMPLING AND ANALYSIS REPORT

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

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}).

Twenty-nine analytes, including 1 volatile organic compound, 10 semivolatile organic compounds, 1 polychlorinated biphenyl, and 16 inorganic analytes, were detected in the soil samples. TPH was detected in one out of two samples at a concentration of 27 milligrams per kilogram (mg/kg). Concentrations of detected analytes are compared to background screening concentrations, residential RBCs, and SCGs in Table 1 of Appendix A. Aroclor-1242 was detected at a concentration in excess of its RBC. No analytes were detected at concentrations in excess of their respective SCGs.

The cumulative noncancer risk or hazard index (HI) calculated for all detected analytes is 0.04 based upon the RBCs for soil. The cumulative ELCR calculated for all carcinogenic analytes detected is 3.7×10^{-6} .

3.2 ECOLOGICAL PRE. The ecological habitat associated with Building 927 was characterized by ABB-ES ecologists in June 1996. Ecological habitat at the study area is limited to regularly mowed grass and scattered pines and is subject to a high degree of foot traffic. The stained soils were observed within a chain-link fence that surrounds the air conditioning unit. Ecological receptors that might occasionally use the study area are likely limited to terrestrial species that are tolerant to human and industrial activity, such as small passerines (e.g. the American robin), small mammals (e.g. the cotton mouse), and soil invertebrates (e.g. the earthworm and graminoids).

Pathways of potential contaminant exposure at Building 927 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. Protected species were not observed and are unlikely to utilize the limited habitat at Building 927. Pathways for soil invertebrates include direct contact and ingestion of surface soil. Pathways for terrestrial plants include direct contact with and root uptake of contaminants in surface soil.

Concentrations of detected analytes are compared to two times the background screening values and to ecological screening values in Table 2 of Appendix A. No ecological screening values were exceeded.

4.0 CONCLUSIONS AND RECOMMENDATIONS

A cumulative noncancer risk or HI of 0.04 was calculated for all detected analytes in soil. The cumulative ELCR calculated for all carcinogenic analytes detected is 3.7×10^{-6} .

Benzo(a)pyrene and Aroclor-1242 are the primary carcinogenic risk contributors. The detected benzo(a)pyrene concentration was equal to its RBC and less than its SCG. The detected concentration of Aroclor-1242 exceeds its RBC; however, it is less than its SCG. TPH was detected in one out of two samples at a concentration of 27 mg/kg. Although no SCG or RBC is available for TPH, SCGs and RBCs are available for semivolatile organic compounds detected in soil that includes petroleum components contributing to the TPH concentration.

Surface soil analytes associated with Building 927 are not expected to adversely impact terrestrial species within plant, invertebrate, or vertebrate groups. Similarly, no unusual risk to human health is anticipated in the event of a future residential land-use exposure scenario. Therefore, based upon the findings of this evaluation, reclassification of the color code for Building 927 from Gray to Light Green is recommended.

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. 1995. *Sampling and Analysis Outline, Building 927, Base Realignment and Closure, Zone D, Industrial and Flightline Area, Group III, Naval Air Station, Cecil Field, Jacksonville, Florida*. Prepared for Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), North Charleston, South Carolina (October).

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

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

FDEP. 1995. *Soil Cleanup Goals for Florida*. Tallahassee, Florida (September 29).

U.S. Environmental Protection Agency (USEPA). 1994a. *USEPA Region IV, Amended Guidance on Preliminary Risk Evaluations (PREs) for the Purpose of Reaching a Finding of Suitability to Lease (FOSL)*. Atlanta, Georgia, (December 20).

USEPA. 1994b. *Drinking Water Regulations and Health Advisories, Office of Water*. Washington, D.C., (February).

USEPA. 1995. *Region IV Waste Management Division Preliminary Risk Evaluation, Ecological Risk Assessment, Supplemental Guidance to RAGS*. Region IV Bulletin No. 1 (November).

REFERENCES (Continued)

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

APPENDIX A

TABLES

**BRAC Preliminary Ecological Risk Evaluation Table for Analytes Detected in Surface Soil
Building 927, NAS Cecil Field**

Analyte	Sample Identifier		Screening Criteria				Criteria Exceeded ⁵
	56S00101	56S00201	BKGRD ¹	Plant ²	Invert ³	Vert ⁴	
Volatile Organic Compounds							
Xylenes (total)	2			1000000		64000000	
Semi-Volatile Organic Compounds							
Benzo (a) anthracene	110	77		25000	34000	910000	
Benzo (a) pyrene	88	51		25000	34000	910000	
Benzo (b) fluoranthene	120	68		25000	34000	910000	
Benzo (g,h,i) perylene	41	22		25000	34000	910000	
Benzo (k) fluoranthene	52			25000	34000	910000	
Chrysene	110	72		25000	34000	910000	
Fluoranthene	200	140		25000	34000	910000	
Indeno (1,2,3-cd) pyrene	43			25000	34000	910000	
Phenanthrene	40	41		25000	34000	910000	
Pyrene	130	100		25000	34000	910000	
Pesticides/PCBs							
Aroclor-1242	200			40000		4200	
Inorganic Analytes							
			0				
Aluminum	782	1960	29086	50		54000	
Antimony	0.5	0.95	0	5		5100 B	
Barium	2.3	3.2	21	500		23000	
Calcium	481	905	0			B	
Chromium	0.8	2	31.2	1	50	14000	
Copper	0.43	0.46	0	100	30	1000 B	
Iron	120	326	8060				
Lead	1.2	2.3	15.6	50	1190	260	
Magnesium	27	61	474				
Manganese	1.9	2	17	500		5800	
Nickel	0.53	0.88	7.2	30	400	550	
Potassium		25.6	310				
Selenium	0.87	0.93	0	1		7.3 B	
Sodium	78	120	0			B	
Vanadium	0.52	1.6	0	2		1100 B	
Zinc	4	4.6	0	50	130	1600 B	
General Chemistry							
Total petroleum hydrocarbons	27						

Notes:

Inorganic and General Chemistry Analytes are reported in mg/kg. All other values are reported in ug/kg.

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

¹ Background screening value for inorganic analytes in surface soil at NAS Cecil Field. This value is equal to two times the average concentration detected during the NAS Cecil Field background sampling program (Refer to Remedial Investigation Report for OU2, ABB-ES, 1995, Appendix J).

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)

**BRAC Preliminary Risk Evaluation Table for Analytes Detected in Surface Soil
Building 927, Naval Air Station Cecil Field**

Analyte	Samples		BKGRD	Screening Values		Calculated Risk Values	
	56S00101	56S00201		SCG	RBC(R)	ELCR	HI
Volatile Organic Compounds							
Xylenes (total)	2			13000000	160000000 n		0.00
Semi-Volatile Organic							
Benzo (a) anthracene	110	77		1400	880 c	1.3E-07	
Benzo (a) pyrene	88	51		100	88 c	1.0E-06	
Benzo (b) fluoranthene	120	68		1400	880 c	1.4E-07	
Benzo (g,h,i) perylene	41	22		14000			
Benzo (k) fluoranthene	52			14000	8800 c	5.9E-09	
Chrysene	110	72		140000	88000 c	1.3E-09	
Fluoranthene	200	140		2900000	3100000 n		0.00
Indeno (1,2,3-cd) pyrene	43			1400	880 c	4.9E-08	
Phenanthrene	40	41		1700000			
Pyrene	130	100		2200000	2300000 n		0.00
Pesticides/PCBs							
Aroclor-1242	200			900	83 c	2.4E-06	
Inorganic Analytes							
Aluminum	782	1960	29086	75000	78000 n		
Antimony	0.5	0.95	*	26	31 n		0.03
Barium	2.3	3.2	21	5200	5500 n		
Calcium	481	905	*				
Chromium	0.8	2	31.2	290	390 n		
Copper	0.43	0.46	*		3100 n		0.00
Iron	120	326	8060		23000 n		
Lead	1.2	2.3	15.6	500			
Magnesium	27	61	474				
Manganese	1.9	2	17	370	1800 n		
Nickel	0.53	0.88	7.2	1500	1600 n		
Potassium		25.6	310				
Selenium	0.87	0.93	*	390	390 n		0.00
Sodium	78	120	*				
Vanadium	0.52	1.6	*	490	550 n		0.00
Zinc	4	4.6	*	23000	23000 n		0.00
General Chemistry							
Total petroleum hydrocarbons	27						
					Sum-	3.7E-06	0.04

Notes:

Inorganic Analytes and General Chemistry are reported in mg/kg, all others are in ug/kg

BKGRD - Background screening concentration for surface soil, ABB-ES OUZ Remedial Investigation Report, May 1995

* - values that exceed background screening criteria, or Soil Cleanup Goals

SCG - Soil Cleanup Goals (Residential scenario), September 1995

RBC(R) - Risk-based Concentration (Residential), USEPA Region III, May 1996

c - carcinogenic risk

n - non-carcinogenic risk

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

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