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NAS CECIL FIELD
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SAMPLING AND ANALYSIS OUTLINE FOR BUILDING 625 NAS CECIL FIELD FL
11/1/1997
ABB ENVIRONMENTAL

SAMPLING AND ANALYSIS REPORT
BUILDING 625
BASE REALIGNMENT AND CLOSURE
ZONE A, YELLOW WATER WEAPONS COMPLEX
GROUP VII
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Unit Identification Code: N60200

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Base Realignment and Closure
Zone A, Yellow Water Weapons Complex, Group VII
NAS Cecil Field, Jacksonville, Florida

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GLOSSARY

ABB-ES	ABB Environmental Services, Inc
BCT	Base Realignment and Closure cleanup team
ELCR	excess lifetime cancer risk
FDEP	Florida Department of Environmental Protection
HQ	hazard quotient
$\mu\text{g}/\ell$	micrograms per liter
NAS	Naval Air Station
PRE	preliminary risk evaluation
RBC	risk-based concentration
SAO	Sampling and analysis outline
TAL	target analyte list
TCL	target compound list
USEPA	U.S. Environmental Protection Agency
YWWX	Yellow Water Weapons Complex

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

Building 625 is a paint booth, located near the center of the Yellow Water Weapons Complex (YWWX). An interceptor designed to separate paint and oil from process wastewater was identified as a potential pathway for contaminants to enter the groundwater. A Sampling and Analysis Outline (SAO) for the assessment of groundwater in the vicinity of paint and oil interceptor at Building 625 was prepared by ABB-ES and approved by the Base Realignment and Closure cleanup team (BCT) (ABB-ES, 1996). Other potential environmental concerns, related to special weapons that may have been stationed at YWWX, are being evaluated separately.

2.0 PHASE II INVESTIGATION

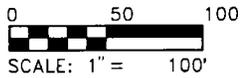
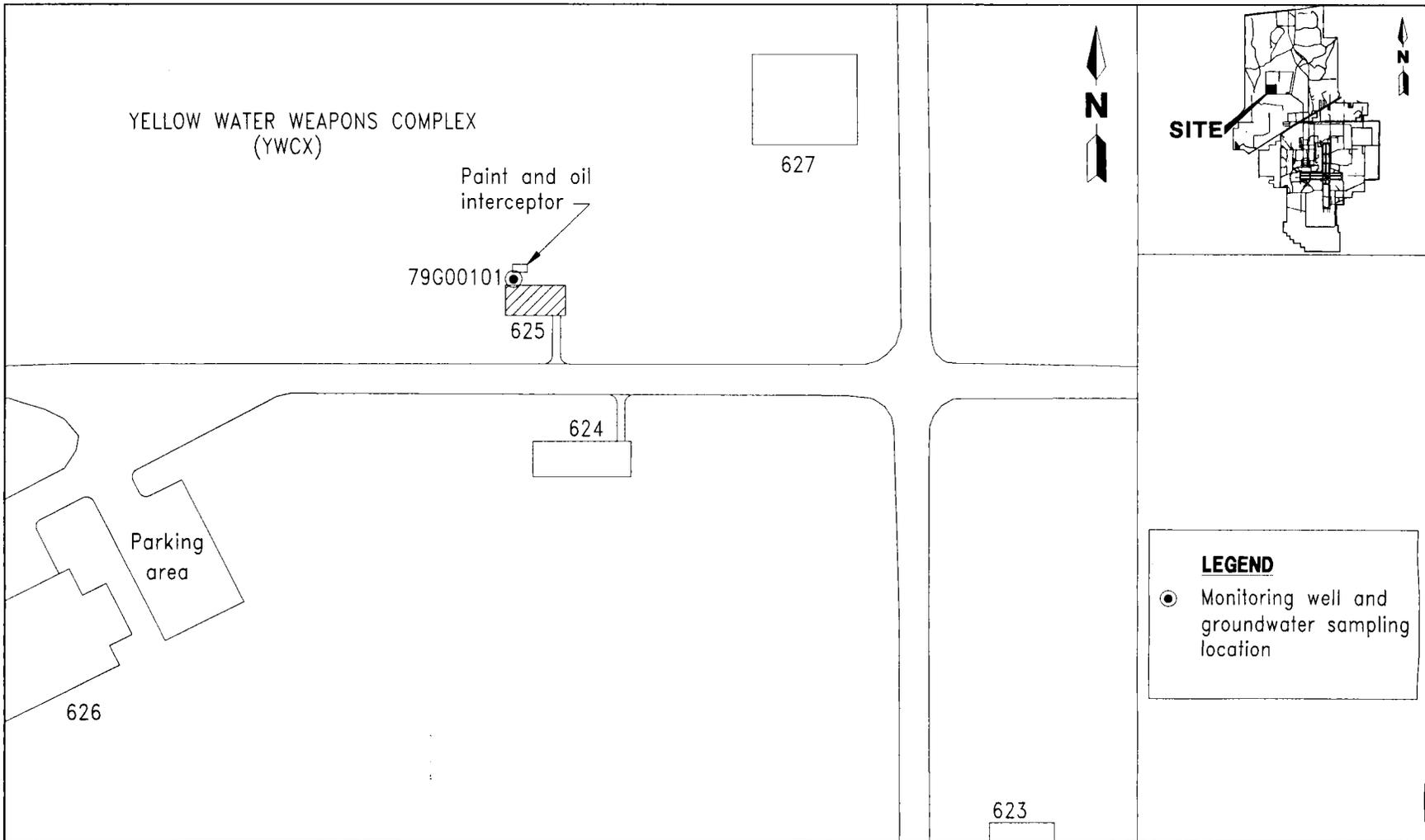
This Phase II investigation included the installation of one shallow groundwater monitoring well and collection and analysis of one groundwater sample. Field activities were undertaken in general conformance with the Project Operations Plan (ABB-ES, 1994a).

The groundwater monitoring well was installed adjacent to the paint and oil separator at Building 625 to a depth of 14 feet below land surface. One groundwater sample was collected and analyzed for the full Contract Laboratory program suite of target compound list (TCL) organics and target analyte list (TAL) inorganics. A general site plan indicating the location of the monitoring well is presented on Figure 1. The soil boring log is included in Appendix A.

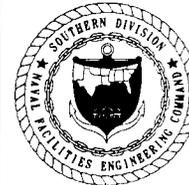
3.0 PRELIMINARY RISK EVALUATION (PRE)

A PRE was conducted to assess potential risks to human and ecological receptors posed by contaminants in groundwater. 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, 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 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 groundwater. Risk-based screening



**FIGURE 1
BUILDING 625
PAINT BOOTH
SAMPLE LOCATION PLAN**



PHASE II SAMPLING AND ANALYSIS REPORT

**NAS CECIL FIELD
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values were obtained from USEPA Region III Risk-Based Concentrations (RBCs) (USEPA, 1996) and FDEP Groundwater Guidance Concentrations (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 (HI).

Twelve inorganic analytes were detected in the groundwater sample collected in the study area. 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 of 1.5, and an ELCR of 4.4×10^{-5} , were calculated based upon RBCs for tap water for all detected analytes.

Thallium was detected at a concentration of 3.1 micrograms per liter ($\mu\text{g}/\ell$), exceeding the FDEP groundwater guidance concentration of $2 \mu\text{g}/\ell$, and the RBC for tap water of $2.9 \mu\text{g}/\ell$. The USEPA maximum contaminant level for thallium in groundwater is $2 \mu\text{g}/\ell$. The analytical result for thallium was less than the contract-required detection limit of $10 \mu\text{g}/\ell$ and was, therefore, qualified as an estimated concentration. There is some uncertainty concerning the detections of thallium in groundwater above the State and Federal MCLs. Thallium has been observed, below the laboratory detection level, at similar concentrations (2 to $6 \mu\text{g}/\ell$) at many sites throughout NAS Cecil Field, including upgradient groundwater samples at OUs 3 and 6. The detection of thallium may be from its presence as a naturally occurring element or from interelemental interference with iron or other cations during the analysis for thallium. Due to the widespread occurrence of thallium at similar concentrations and the potential for interelemental interference, it does not appear that thallium is site related.

Arsenic was detected at a concentration of $2 \mu\text{g}/\ell$ and exceeds the RBC for tap water of $0.045 \mu\text{g}/\ell$. However, the Florida groundwater guidance concentration for arsenic is $50 \mu\text{g}/\ell$. Arsenic is naturally occurring at NAS Cecil Field and may not represent a release from the site. No other analytes were detected in excess of screening criteria.

3.2 ECOLOGICAL PRE. Potential exposure pathways and ecological habitat associated with Building 625 were characterized by ABB-ES ecological risk assessors in June 1996. Building 625 is surrounded by mowed grass. 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 625 and analyzed to determine the concentrations of TCL organic and TAL

inorganic compounds. Concentrations of detected compounds were compared to human health and ecological screening criteria. A cumulative hazard index of 1.5 was calculated for all noncarcinogenic analytes detected, and an ELCR of 4.4×10^{-5} was calculated for carcinogenic compounds.

Thallium and arsenic are the only analytes detected at a concentration in excess of their respective RBCs. However, due to the widespread occurrence of thallium (a naturally occurring element) at NAS Cecil Field, and the potential for inter-elemental interference during analysis, it does not appear that thallium is site related. Arsenic is naturally occurring at NAS Cecil Field and may not represent a release from the site. In addition, the detected concentration of arsenic is below the Florida groundwater guidance concentration.

There is no potable water supply associated with Building 625; 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 625 do not represent a hazard to human health or the environment. However, the BCT has concurred that all facilities within YWWX shall be designated as "encumbered" until the radiological survey for release has been completed. Therefore, the color classification for Building 625 should be changed from Gray to Light Green (Encumbered).

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- ABB-ES. 1995. Minutes of September 25, 1995, conference call to discuss preliminary risk evaluations.
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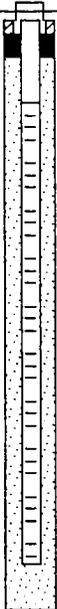
U.S. Environmental Protection Agency (USEPA). 1994. *USEPA Region IV, Amended Guidance on Preliminary Risk Evaluations (PREs) for the Purpose of Reaching a Finding of Suitability to Lease (FOSL)*, Atlanta, Georgia, (December 20).

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

APPENDIX A
SOIL BORING LOGS AND TABLE

Project: NAS Cecil Field BRAC		Well ID: CEF-825-1S	Boring ID: CEF-825-1S
Client: SOUTHDIYNAVFACENGCOM		Contractor: Alliance Environmental, Inc.	Job No.: 08520-85
Northing/Easting: 389017.928/2158390.451		Date started: 10-22-98	Compltd: 10-22-98
Method: Auger	Casing dia.: 2 in.	Screened Int.: 2 - 12 ft.	Protection level: D
TOC elev.: Ft.	Type of OVM: PID	Total dpth: 13.0Ft.	Dpth to ∇: 4.0 Ft.
ABB Rep.: R. Holloway	Well development date: 10-22-98		Site: 79 - 825 Paint Booth

Depth Ft.	Laboratory Sample ID.	Sample Recovery	Headspace (ppm)	Soil/Rock Description and comments	Lithologic symbol	Soil class.	Blows/6-in.	Well diag.
0			0	SILTY SAND (SM): 100%, quartz, light to dark gray, fine- to very fine- grained, sub-angular to sub-rounded.		SM	posthole	
0			0				posthole	
5								
10								
15								
20								
25								
30								

**Table A-1
BRAC Preliminary Risk Evaluation Table for Analytes Detected
in Groundwater**

Sampling and Analysis Report, Building 625
Base Realignment and Closure
Zone A, Yellow Water Weapons Complex, Group VII
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Analyte	Sample	Screening Values		Calculated Risk Values	
	79G00101	FDEPGCC	RBC(T)	ELCR	HQ
<u>Inorganic Analytes</u>					
Antimony	5.5	6 p	15 n		
Arsenic	2	50 p	0.045 c	4.44E-05	0.37
Barium	11.4	2,000 p	2,600 n		0.00
Copper	1	s	1,500 n		0.00
Iron	72.4	s	11,000 n		0.01
Magnesium	3,410				
Manganese	5.6	s	840 n		0.01
Potassium	496				0.01
Thallium	3.1	2 p*	2.9 n		1.07
Vanadium	6.2	49 st	260 n		0.02
Zinc	6.3	s	11,000 n		0.00
Cyanide	1.5	200 p	730 n		0.00
			Sum	4.4E-05	1.18

Notes: All analytes are reported in micrograms per liter.
Sample suffixes indicate the following: F = filtered sample, DL = laboratory diluted sample, RE = laboratory reextracted, D = field duplicate.

BRAC = Base Realignment and Closure (Act).

NAS = Naval Air Station.

FDEPGGC = FDEP Groundwater Guidance Concentration, June 1994.

RBC(T) = Risk-based concentration (tap water), USEPA Region III, May 1996.

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

HQ = calculated hazard quotient for noncarcinogenic analytes; HQ detected concentration/RBC(T).

p = primary standard (MCL).

n = noncarcinogenic risk.

c = carcinogenic risk.

* = values that exceed FDEPGGC.

st = systematic toxicant.

