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SAMPLING AND ANALYSIS REPORT FOR SITE A-5 FORMER SMALL ARMS RANGE BASE
REALIGNMENT AND CLOSURE ZONE A YELLOW WATER WEAPONS AREA GROUP 1 NAS
CECIL FIELD FL
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ABB ENVIRONMENTAL SERVICES INC

SAMPLING AND ANALYSIS REPORT
SITE A-5 FORMER SMALL-ARMS RANGE
BASE REALIGNMENT AND CLOSURE
ZONE A, YELLOW WATER WEAPONS AREA
GROUP I

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

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GLOSSARY

ABB-ES ABB Environmental Services, Inc

BRAC Base Realignment and Closure

EBS environmental baseline survey

FOSL Finding of Suitability to Lease

FOST Finding of Suitability to Transfer

NAS Naval Air Station

POP project operations plan

PRE preliminary risk evaluation

SAO sampling and analysis outline

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 Site A-5 (base facility number 712) at Naval Air Station (NAS) Cecil Field. This report summarizes the related field operations, observations, and findings undertaken in partial fulfillment of the requirements of the NAS Cecil Field Base Realignment and Closure (BRAC) program.

Site A-5 is referred to as a small-arms range in the Environmental Baseline Survey (EBS) (ABB-ES, 1994a). The site is located in an open clearing in a remote part of the northeast section of the Yellow Water Weapons Area at NAS Cecil Field. The potential for elevated concentrations of lead in surface soils was identified as a concern during the EBS and has precluded a Finding of Suitability to Lease (FOSL) or a Finding of Suitability to Transfer (FOST) for Site A-5. A Sampling and Analysis Outline (SAO) for assessment of surface soil was prepared by ABB-ES and approved by the BRAC Cleanup Team. The Phase II Sampling and Analysis program developed in the SAO is intended to augment existing information used to evaluate whether the site should be recommended for an FOSL or FOST.

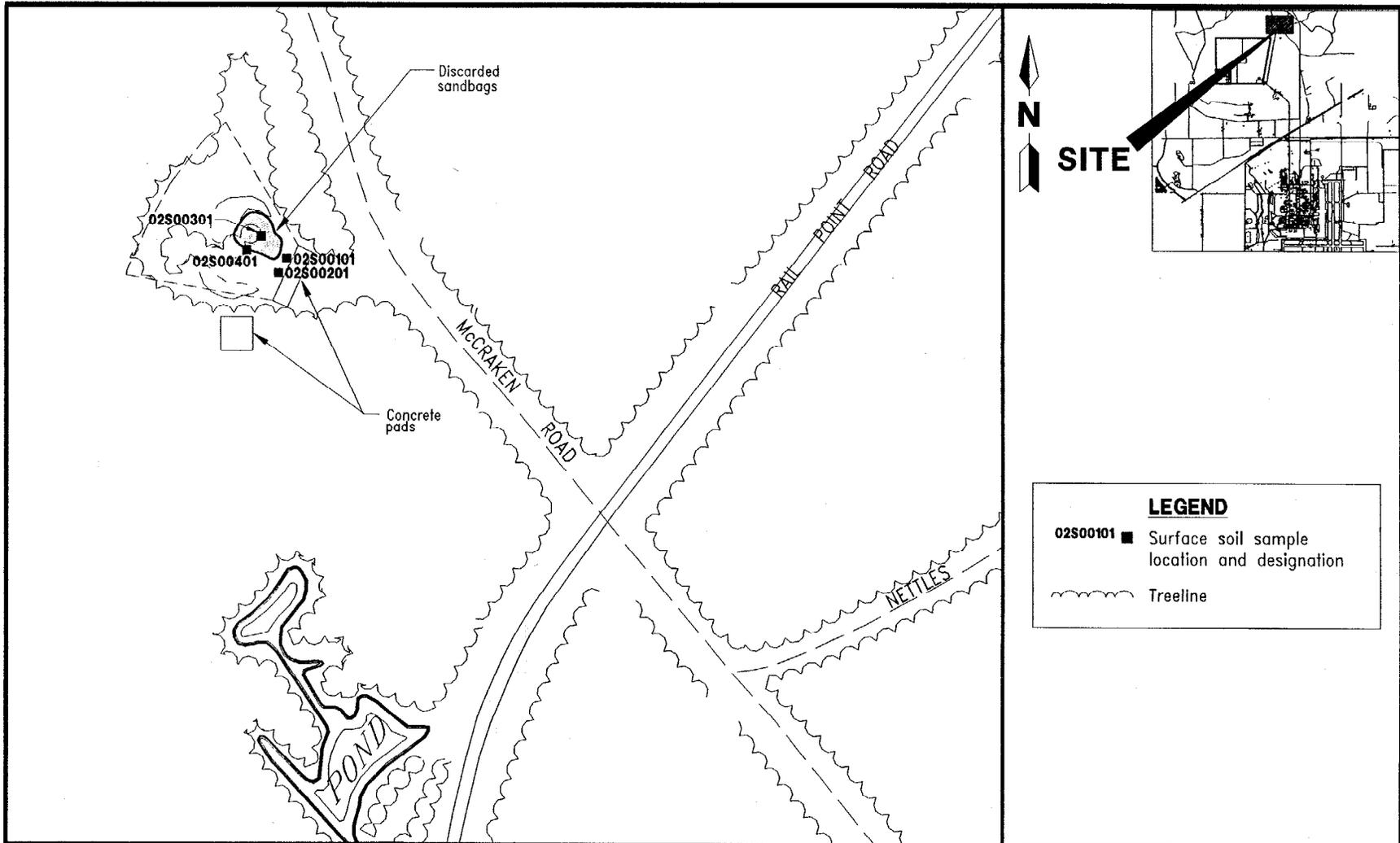
2.0 PHASE II INVESTIGATION

This Phase II investigation included collection of four surface soil samples. Samples were located in inferred target areas (Figure 1). Field methods and laboratory protocols were specified to satisfy requirements for U.S. Environmental Protection Agency (USEPA) Level IV data quality objectives. Field activities were undertaken in general conformance with the Project Operations Plan (POP) (ABB-ES, 1994b) to fulfill the objectives of the site-specific SAO. Surface soil samples were submitted to CompuChem Laboratories, Incorporated, for lead analysis by Method 6010.

3.0 PRELIMINARY RISK EVALUATION

A preliminary risk evaluation (PRE) was conducted to assess potential risks to human and ecological receptors by lead in surface 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 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 bulletins on ecological risk assessment (USEPA, 1995), and minutes of meetings with the USEPA and the Florida Department of Environmental Protection concerning PREs (ABB-ES, 1995c). Site background information and rationale for sample collection and analysis are detailed in the EBS report and SAO.

3.1 PUBLIC HEALTH PRELIMINARY RISK EVALUATION. Detected concentrations of lead, were compared to the USEPA established guidance concentration for screening (Table 1). The guidance concentration is not appropriate for quantifying human



0 150 300
SCALE: 1 INCH = 300 FEET

FIGURE 1
SITE A-5
FORMER SMALL-ARMS RANGE
YELLOW WATER WEAPONS AREA
SAMPLE LOCATION PLAN



PHASE II SAMPLING AND ANALYSIS
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Table 1
Summary of Positive Detections in Surface Soil Samples

Sampling and Analysis Report
 Site A-5 Former Small-Arms Range
 Base Realignment and Closure
 Zone D, Industrial and Flightline Area Group II
 NAS Cecil Field, Jacksonville, Florida

Parameter	Sample 02S00101	Sample 02S00201	Sample 02S00301	Sample 02S00401	Background Screening Concentration ¹	Risk-based Screening Concentration (Resident) ²	Florida Cleanup Goals (Resident) ³	Florida Cleanup Goals (Industrial) ²	Exceeds Residential Screening Concentration ⁴	Exceeds Industrial Screening Concentration ⁴
Inorganics (mg/kg)										
Lead	3.1	10.9	93.2	187	15.6	400	500	1000	No	No

¹ The background screening value is twice the average of detected concentrations for inorganic analytes in background samples. Organic values are one times the mean of detected concentration. Organic values are included for comparison purposes only.

² The value for lead is based on the USEPA Office of Solid Waste and Emergency Response Directive No. 9355.4-12 revised interim recommended soil cleanup for CERCLA and RCRA sites.

³ Values are taken from the Florida Department of Environmental Protection memorandum, Soil Cleanup Goals for Florida, dated September 29, 1995.

Notes: NAS = Naval Air Station.
 mg/kg = milligrams per kilogram.
 USEPA = U.S. Environmental Protection Agency.
 CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act.
 RCRA = Resource Conservation and Recovery Act.

Table 2
Comparison of Site A-5 Surface Soil Concentrations
of Lead to Ecological Screening Values

Sampling and Analysis Report
 Site A-5 Former Small-Arms Range
 Base Realignment and Closure
 Zone D, Industrial and Flightline Area Group II
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Analyte	Background Screening Value (mg/kg) ¹	Plant Screening Value (mg/kg) ²	Invertebrate Screening Value (mg/kg) ³	Vertebrate Screening Value (mg/kg) ⁴	Sample 02S00101 (mg/kg)	Sample 02S00201 (mg/kg)	Sample 02S00301 (mg/kg)	Sample 02S00401 (mg/kg)	Exceeds (B, P, I, V) ⁵
Lead	15.6	50	1,190	260	3.1	10.9	93.2	187	B, P

¹ Two times the average background concentration is used as the background screening value. Background screening was performed only on inorganic chemicals.

² Phytotoxicity screening values are from Suter et al., 1993 and Will and Suter, 1994. The screening value is the lowest observed effect concentration from among plant growth studies conducted in solid media. (See Appendix B for further information.)

³ Invertebrate screening values are from Neuhauser et al., 1985 and others (see Appendix B). For organic compounds, the value is based upon the lowest LC₅₀ (14-day soil test on *Eisenia foetida*) from among chemicals in the same chemical class; a conservative factor of 0.2 was applied and the resultant value should be protective of 99.9% of the population from acute effects (USEPA, 1986).

⁴ Vertebrate screening values are protective contaminant levels (PCLs) from Table B-2 and are derived as described in Appendix B. The value presented represents the lowest PCL for the short-tailed shrew, cotton mouse, American robin, red-tailed hawk, or red fox.

⁵ The screening value is exceeded for receptor group, as represented by the following letter codes:

- B = Background screening value
- P = Plant screening value
- I = Invertebrate screening value
- V = Vertebrate screening value

Notes: See Appendix B for methods and assumptions used in calculation of screening values.

See Appendix B References for the complete references cited in this table.

NAS = Naval Air Station.

mg/kg = milligrams per kilogram.

■ = Sample concentration exceeds screening value.

USEPA = U.S. Environmental Protection Agency.

risks, however, it is assumed that if the lead concentration is below the screening guidance concentration, the site does not represent an unacceptable level of risk.

3.2 ECOLOGICAL PRELIMINARY RISK EVALUATION. An ecological PRE was conducted to evaluate potential risks to ecological receptors in the vicinity of Site A-5. Exposure pathways and ecological habitats were characterized during a site walk-over conducted by ABB-ES ecological risk assessors in September 1995. The methods and assumptions used in derivation of ecological screening values applied in this evaluation are presented in the POP (ABB-ES, 1994b).

The study area is heavily vegetated and is best characterized as an overgrown field. Vegetative cover consists primarily of mixed graminoids, interspersed with a variety of herbaceous plants, and a few scattered shrubs and small trees. It is bordered by a mixed pine and hardwood forest. This forest is likely to provide habitat for a varied assemblage of wildlife, including both herbivores and higher trophic levels. Wildlife in the area is likely to utilize the open area while preying. A gopher tortoise (*Gopherus polyphemus*), listed as a species of special concern in the state of Florida (Wood, 1994), was observed near a burrow located near the surface soil sampling stations. No additional protected species of plants or animals were observed during the site walk-over. Other protected species such as the eastern indigo snake (*Drymarchon corais couperi*) are known to occasionally utilize gopher tortoise burrows in the southeastern United States. Bachman's sparrow (*Aimophila aestivalis*) and the loggerhead shrike (*Lanius lucovicianus*) have been observed in other portions of the Yellow Water Weapons Area of NAS Cecil Field, and could occasionally utilize the study area. Appendix B, Table B-1, lists the rare, threatened, and endangered species that may utilize NAS Cecil Field.

Pathways of potential surface soil contaminant exposure are identified for wildlife receptors via direct contact, incidental ingestion, and terrestrial food web exposure to contaminants that may bioaccumulate. The primary exposure identified for terrestrial plants and invertebrates was direct contact. Invertebrates may also be exposed by soil ingestion.

Lead concentrations were in excess of the background screening value in two surface soil sample locations at Site A-5. The ecological (plant) screening criteria for lead was also exceeded at these locations. Plant screening values are highly conservative, and site inspection of the study area did not reveal areas of stressed vegetation. Lead concentrations in surface soil at Site A-5 were less than screening values for terrestrial invertebrates and wildlife (Table 2) and are not expected to adversely impact species within these groups.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The concentration of lead in surface soil samples collected at Site A-5 is below USEPA human health screening guidance concentrations. A comparison of lead concentrations in surface soil from Site A-5 with conservative ecological screening values suggests that significant risk is unlikely for terrestrial plants, invertebrates, or wildlife. An active gopher tortoise burrow was observed at the site, but based on the vertebrate screening value, the gopher tortoise does not appear to be at risk from lead in the surface soil. Physical alteration of habitat and human exploitation are the primary reasons for decline

of the gopher tortoise populations in Florida (Moler, 1992). Therefore, plans for future use of the Site A-5 area should consider potential adverse effects on the gopher tortoise. Efforts should be made to preserve the gopher tortoise habitat in order to protect this species and possibly other animals that utilize the gopher tortoise burrow.

Based on the information obtained for this assessment, the concentration of lead in surface soil at Site A-5 does not represent a hazard to human health or the environment. Therefore, a reclassification of the color code, from Gray to Light Green, is recommended for Site A-5.

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