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REMEDIAL INVESTIGATION REPORT FOR SURFACE AND SUBSURFACE SOIL AT SITE 13

NAS WHITING FIELD FL

7/1/1999

HARDING LAWSON ASSOCIATES

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REMEDIAL INVESTIGATION REPORT FOR SURFACE AND SUBSURFACE SOIL AT SITE 13, SANITARY LANDFILL

NAVAL AIR STATION WHITING FIELD MILTON, FLORIDA

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July 1999

CERTIFICATION OF TECHNICAL
DATA CONFORMITY (MAY 1987)

The Contractor, Harding Lawson Associates, hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-89-D-0317/116 are complete and accurate and comply with all requirements of this contract.

DATE: July 19, 1999

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FOREWORD

To meet its mission objectives, the U.S. Navy performs a variety of operations, some requiring the use, handling, storage, or disposal of hazardous materials. Through accidental spills and leaks and conventional methods of past disposal, hazardous materials may have entered the environment in ways unacceptable by today's standards. With growing knowledge of the long-term effects of hazardous materials on the environment, the Department of Defense initiated various programs to investigate and remediate conditions related to suspected past releases of hazardous materials at their facilities.

One of these programs is the Installation Restoration (IR) program. This program complies with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA), the Resource Conservation and Recovery Act and the Hazardous and Solid Waste Amendments of 1984. These acts establish the means to assess and clean up hazardous waste sites for both private-sector and Federal facilities. The CERCLA and SARA form the basis for what is commonly known as the Superfund program.

Originally, the Navy's part of this program was called the Naval Assessment and Control of Installation Pollutants (NACIP) program. Early reports reflect the NACIP process and terminology. The Navy eventually adopted the program structure and terminology of the standard IR program.

The IR program is conducted in several stages as follow:

- preliminary assessment (PA)
- site inspection (SI) (formerly the PA and SI steps were called the initial assessment study under the NACIP program),
- remedial investigation and feasibility study, and
- remedial design and remedial action.

The Southern Division, Naval Facilities Engineering Command manages and the U.S. Environmental Protection Agency and the Florida Department of Environmental Protection (formerly Florida Department of Environmental Regulation) oversee the Navy environmental program at Naval Air Station (NAS) Whiting Field. All aspects of the program are conducted in compliance with State and Federal regulations, as ensured by the participation of these regulatory agencies.

Questions regarding the CERCLA program at NAS Whiting Field should be addressed to Ms. Linda Martin, Code 1859, at (803) 820-7341.

EXECUTIVE SUMMARY

A remedial investigation (RI) and feasibility study (FS) is being conducted at Naval Air Station (NAS) Whiting Field in Milton, Florida, by Southern Division, Naval Facilities Engineering Command as part of the Department of Defense Installation Restoration (IR) program. The IR program was designed to identify and abate or control contaminant migration resulting from past operations at naval installations.

A phased approach was implemented to conduct the RI. Phase I was completed in May 1992. The subsequent phases of the RI were designated as Phase IIA and Phase IIB. Fieldwork for Phase IIA was completed in March 1994. RI Phase IIB was completed in November 1996.

This RI report contains the results of assessment activities used to characterize site-specific chemicals detected in environmental media (soil and groundwater) at Site 13, Sanitary Landfill, at NAS Whiting Field. Data obtained from these activities were used to evaluate the nature and extent of contamination at the site and support FSs (if required) and baseline risk assessments. Human health and ecological baseline risk assessments are included with the RI report.

The fieldwork conducted during the RI included the following tasks:

- geophysical survey,
- soil gas survey,
- surface soil sampling,
- subsurface soil sampling,
- monitoring well installation,
- groundwater sampling, and
- hydrogeologic investigations.

Soil and groundwater samples were analyzed for target compound list organic analytes, and target analyte list (TAL) inorganic analytes.

The following conclusions are based on results of the RI investigation activities at Site 13, Sanitary Landfill, NAS Whiting Field.

- Surface soil at Site 13 is moderately permeable, fine-grained clayey sand and silty sand. The shallow subsurface soil (2 to 7 feet below land surface [bls]) contained interbedded sand, silt, and clay layers. The lithology of subsurface soil consists predominantly of silt and sands overlying well graded sands. Stringers of clay and poorly graded sands were common throughout the area. A clay layer of significant thickness (greater than 4 feet) and areal extent appears to exist within the Southeast Disposal Area. The layer is 15 to 25 feet thick and is located between 75 and 50 feet above sea level. The clay layer was not identified in the boring for monitoring well WHF-13-1S, indicating the layer may be discontinuous at Site 13.

- A geophysical survey indicated the approximate lateral boundaries of the sanitary landfill at Site 13. The landfill consists of three primary, north-south trending trenches occupying a combined area of

approximately 1,750 feet by 250 feet. Several additional isolated geophysical anomalies were identified in the southwest quadrant of Site 13, west of the main landfill boundaries. The isolated anomalies are interpreted to represent buried ferromagnetic materials.

- Ten TAL metals (aluminum, arsenic, barium, calcium, chromium, iron, manganese, silver, vanadium, and zinc) were detected in surface soil samples at concentrations exceeding their respective background screening values. Detected concentrations of aluminum, arsenic, iron, and vanadium exceeded residential standards for U.S. Environmental Protection Agency (USEPA) Region III risk-based concentrations (RBCs). Concentrations of arsenic also exceeded the industrial standards for the USEPA Region III RBCs and residential and industrial standards for the soil cleanup goals for Florida.

- Mercury, phenol, and 4-methylphenol were detected in subsurface soil at concentrations above the soil leachability cleanup target levels for Florida. These exceedances will be addressed in the site 40 basewide groundwater investigation.

- Four TAL metals (arsenic, cyanide, mercury, and sodium) were detected in subsurface soil samples at concentrations exceeding their respective background screening values. Arsenic was detected at concentrations exceeding residential and industrial standards for soil cleanup goals for Florida and the USEPA Region III RBCs.

- Trichloroethene was detected in Phase II groundwater samples at concentrations exceeding the Federal maximum contaminant level (MCL) of 0.5 micrograms per liter ($\mu g/\ell$) and the Florida groundwater guidance concentration of 3 $\mu g/\ell$.

- Nine TAL analytes (arsenic, barium, calcium, iron, lead, magnesium, manganese, sodium, and zinc) were detected at concentrations exceeding their respective background screening values in groundwater samples collected at Site 13. Three analytes (aluminum, iron, and manganese) were present at concentrations exceeding their respective Federal MCLs and Florida groundwater guidance concentrations.

- The water table is approximately 40 to 65 feet bls at the site. The groundwater flow direction is southeast across the site. The average horizontal seepage velocity for the Southeast Disposal Area sites was approximately 27 feet per year (ft/yr).

- Groundwater is the dominant transport pathway for migration of chemicals of potential concern (CPCs) off site. Based on an average horizontal seepage velocity of 27 ft/yr and the 20-year site history, the maximum migration distance for CPCs is estimated to be 540 feet. Incorporation of correction factors for dispersion and uncertainty of slug test data results may reduce the migration distance to approximately 39 feet. Analytical groundwater data from downgradient monitoring wells do not indicate chemicals are migrating from the site.

- The total excess lifetime cancer risk (ELCR) at Site 13 (1×10^{-5}), associated with exposure to soil by a hypothetical future resident exceeded Florida's target risk level of concern (1×10^{-6}) due to arsenic, and therefore may pose an unacceptable risk. This risk may be due to naturally occurring levels of arsenic.

- Exposure to subsurface soils at Site 13 does not pose an unacceptable risk based on USEPA and Florida target risk limits. The arsenic exposure point concentration (EPC) does exceed Florida's soil cleanup goal for an industrial site. This risk may be due to naturally occurring levels of arsenic in Florida.

- The background levels of arsenic at Site 13 exceed Florida residential soil cleanup goals and may result in an unacceptable carcinogenic risk. Naturally occurring arsenic likely contributes to the Florida Department of Environmental Protection target risk level exceedance.

- Groundwater at Site 13 may pose an unacceptable risk to hypothetical future residents (ELCR is 3×10^{-5}) due to arsenic. Although this value exceeds Florida's target risk level for arsenic, the EPC for arsenic is an order of magnitude less than both the Federal drinking water standard and Florida's groundwater guidance concentration.

- Surface soil was the only medium evaluated for ecological receptors.

- No lethal risks are predicted for any of the representative wildlife species at Site 13.

- No potential effects on growth or reproduction in the cotton mouse, red fox, or birds are expected as a result of exposure to surface soil.

- Direct and indirect ingestion of surface soil by the short-tailed shrew may result in a potential sublethal risk such as reduction in growth or reproduction at the individual level, but no adverse effects are predicted at the population level. Sublethal effects in this species are related primarily to aluminum concentrations in surface soil.

- For terrestrial plants, exposure concentrations of aluminum and vanadium exceed their respective phytotoxicity benchmark values. However, the reasonable maximum exposure (RME) value for both of these inorganics is consistent with published regional background values. In addition, the vegetative covering at Site 13 is consistent with recolonization of a disturbed area, with no sign of stress consistent with inorganics. Therefore, plant biomass used as forage and plant cover are not expected to be reduced such that the bird and small mammal populations at Site 13 would be affected.

- RMEs of all ecological CPCs are well below their corresponding invertebrate toxicity benchmark values. No potential effects on the small mammal and bird populations are expected as a result of impacts to invertebrates used as forage material.

Based on the interpretation of findings from the remedial investigation activities, a FS is recommended for Site 13, Sanitary Landfill to address the presence of arsenic in the surface soils. Although groundwater analytical results, summaries and conclusions are included in this RI report, the groundwater at NAS Whiting Field has been designated as a separate site (Site 40, Facilitywide Groundwater). Therefore, chemicals in the groundwater that pose a threat to human and ecological receptors will be evaluated as part of the Site 40 RI/FS. Subsurface soil samples with concentrations exceeding Florida leachability cleanup target levels will also be evaluated in the Site 40 RI/FS. The Site 40 assessment will supersede the evaluation presented in this report.

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GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
ARAR	applicable or relevant and appropriate requirement
BAF	bioaccumulation factor
BAT	Bengt-Arne-Torstensson
BEHP	bis(2-ethylhexyl)phthalate
bls	below land surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
cm/sec	centimeters per second
CPC	chemical of potential concern
CT	central tendency
%D	percent Difference
DQO	data quality objective
ECPC	ecological contaminant of potential concern
Eh	redox potential
ELCR	excess lifetime cancer risk
EM	electromagnetic
EPC	exposure point concentration
ERA	ecological risk assessment
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FS	feasibility study
ft/day	feet per day
ft/ft	feet per foot
ft/yr	feet per year
GIR	General Information Report
HLA	Harding Lawson Associates
HHCPC	human health chemical of potential concern
HHRA	human health risk assessment
HI	hazard index
HQ	hazard quotient
HRS	Hazard Ranking System
IAS	initial assessment study
ICV	initial calibration verification
IDL	instrument detection limit
IR	installation restoration
K	hydraulic conductivity
K_{oc}	organic carbon partitioning coefficient

GLOSSARY (Continued)

LD_{50}	lethal dose to 50 percent of test population
LDC	Laboratory Data Consultants, Inc.
LOAEL	lowest observed adverse effects level
MAG	magnetometer
MCL	maximum contaminant level
μg/kg	micrograms per kilogram
μg/ℓ	micrograms per liter
μmhos/cm	micromhos per centimeter
mg/kg	milligrams per kilogram
mg/ℓ	milligrams per liter
MS/MSD	matrix spike and matrix spike duplicate
NAS	Naval Air Station
NCP	National Oil and Hazardous Substances Contingency Plan
NEESA	Naval Energy and Environmental Support Activity
NGVD	National Geodetic Vertical Datum of 1929
NOAEL	no observable adverse effect level
NPL	National Priority List
NTU	nephelometric turbidity unit
OVA	organic vapor analyzer
PARCC	precision, accuracy, representativeness, completeness, and comparability
PCB	polychlorinated biphenyl
PCPT	piezocone penetrometer test
PDE	potential dietary exposure
ppm	parts per million
QAPP	Quality Assurance Program Plan
QC	quality control
RBC	risk-based concentration
RGO	remedial goal option
RI	remedial investigation
RI/FS	remedial investigation and feasibility study
RME	reasonable maximum exposure
RPD	relative percent difference
RRF	relative response factor
%RSD	percent relative standard deviation
RTV	reference toxicity value
SARA	Superfund Amendments and Reauthorization Act
SDG	sample delivery group
SFF	site foraging frequency
SOUTHNAV-FACENGCOM	Southern Division, Naval Facilities Engineering Command
SQL	sample quantitation limit
SU	standard unit
SVOC	semivolatile organic compound

GLOSSARY (Continued)

TAL	target analyte list
TCE	trichloroethene
TCL	target compound list
™	trademark
TVOC	total volatile organic compound
UCL	upper confidence limit
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound

1.0 INTRODUCTION

Harding Lawson Associates (HLA), under contract to the Department of Navy, Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) is submitting the Remedial Investigation (RI) Report for Site 13, Sanitary Landfill Area at Naval Air Station (NAS) Whiting Field located in Milton, Florida. The RI Report for Site 13 is one in a series of site-specific reports being completed in conjunction with the NAS Whiting Field General Information Report (GIR) (HLA, 1998) to summarize the previous investigations and to present the results of the RI.

The Remedial Investigation and Feasibility Study (RI/FS) is being conducted on behalf of the Navy at NAS Whiting Field under contract No. N62467-89-D-0317. The RI was conducted in three phases. The Phase I RI field program was completed in May 1992. The Phase IIA RI field program was conducted between May 1992 and March 1994. The Phase IIB RI field program was completed in October 1997.

Installation Location and Description. NAS Whiting Field is located in Santa Rosa County, in Florida's northwest coastal area, approximately 5.5 miles north of Milton and 25 miles northeast of Pensacola (Figure 1-1). NAS Whiting Field presently consists of two air fields separated by an industrial area. The entire installation is approximately 3,872 acres. Figure 1-2 presents the installation layout and locations of RI/FS sites at NAS Whiting Field. A complete description of historic operations at the facility is presented in Section 1.3 and Appendix A of the NAS Whiting Field GIR (HLA, 1998).

1.1 PURPOSE OF THE REMEDIAL INVESTIGATION AND FEASIBILITY STUDY. The purpose of the NAS Whiting Field RI is to identify and characterize the nature and extent of chemicals in environmental media and potential risks to human and ecological receptors posed by toxic or hazardous chemicals present on site. The chemicals were potentially released to the environment during past waste disposal practices or spills. The data collected during the RI field program will also be used in a feasibility study (FS) (if necessary) to screen, evaluate, and select remedial alternatives to provide permanent, feasible solutions to environmental impacts that may have resulted from past waste disposal practices or spills.

1.2 SITE DESCRIPTION. Site 13 is located along the eastern facility boundary near the South Air Field (Figure 1-2). The site is rectangular in shape, trending north to south, and covers approximately 4 acres. The site was used as the primary sanitary landfill for NAS Whiting Field from 1979 to 1984. During 1979 waste solvents and residue from paint-stripping operations may have been disposed of at the site. After 1979, the landfill reportedly received only general refuse and nonhazardous waste. The vegetated "Y" drainage ditch borders the landfill to the west and south. The general slope of the land is from northwest to southeast. The landfill is depressed relative to the surrounding land surface, and runoff typically ponds on site. When there is surface runoff from the site, it drains toward Big Coldwater Creek, located approximately 8,800 feet east of the site (Figure 1-2).

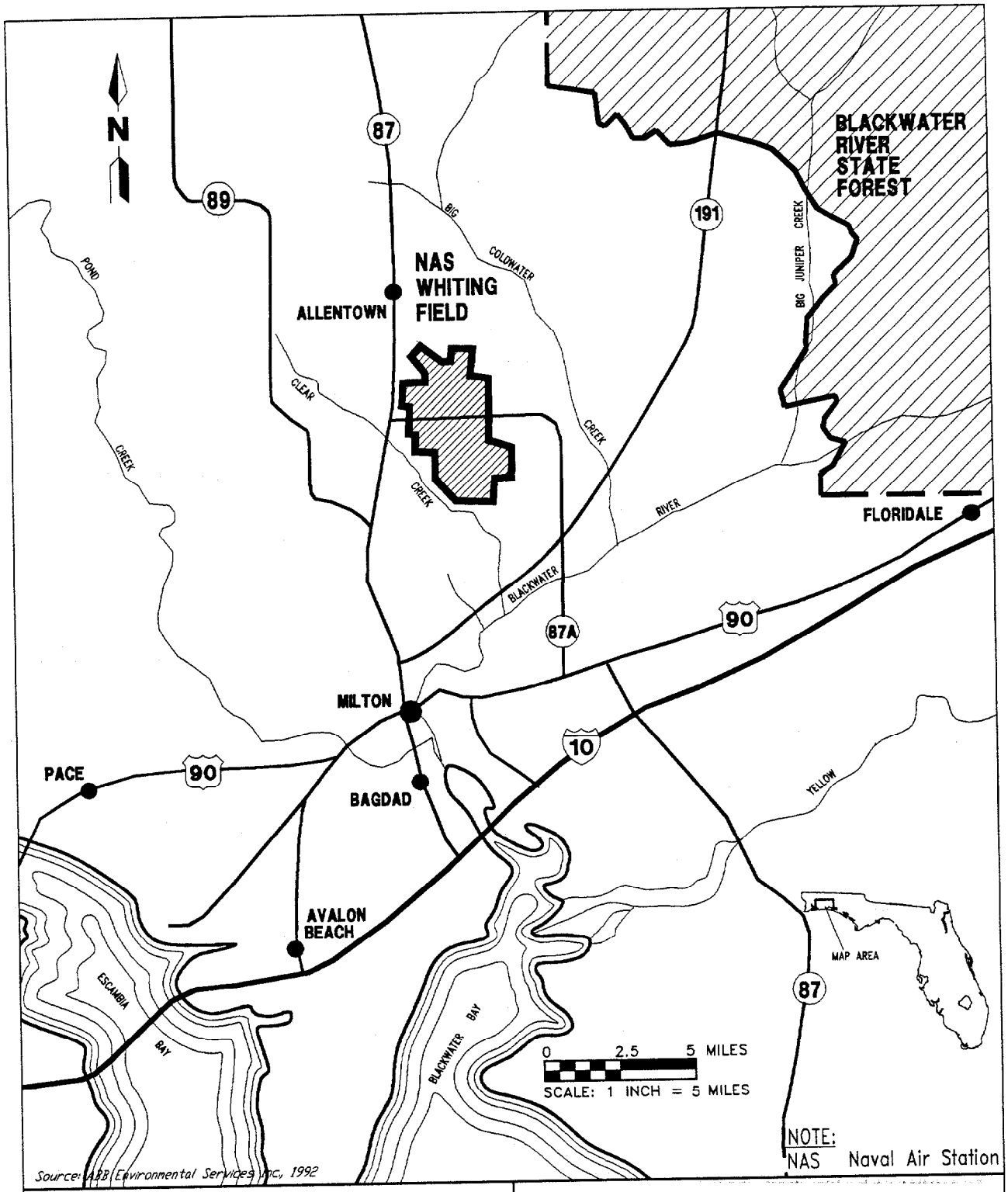

FIGURE 1-1
FACILITY LOCATION MAP

REMEDIAL INVESTIGATION REPORT
SITE 13, SANITARY LANDFILL

NAS WHITING FIELD
MILTON, FLORIDA

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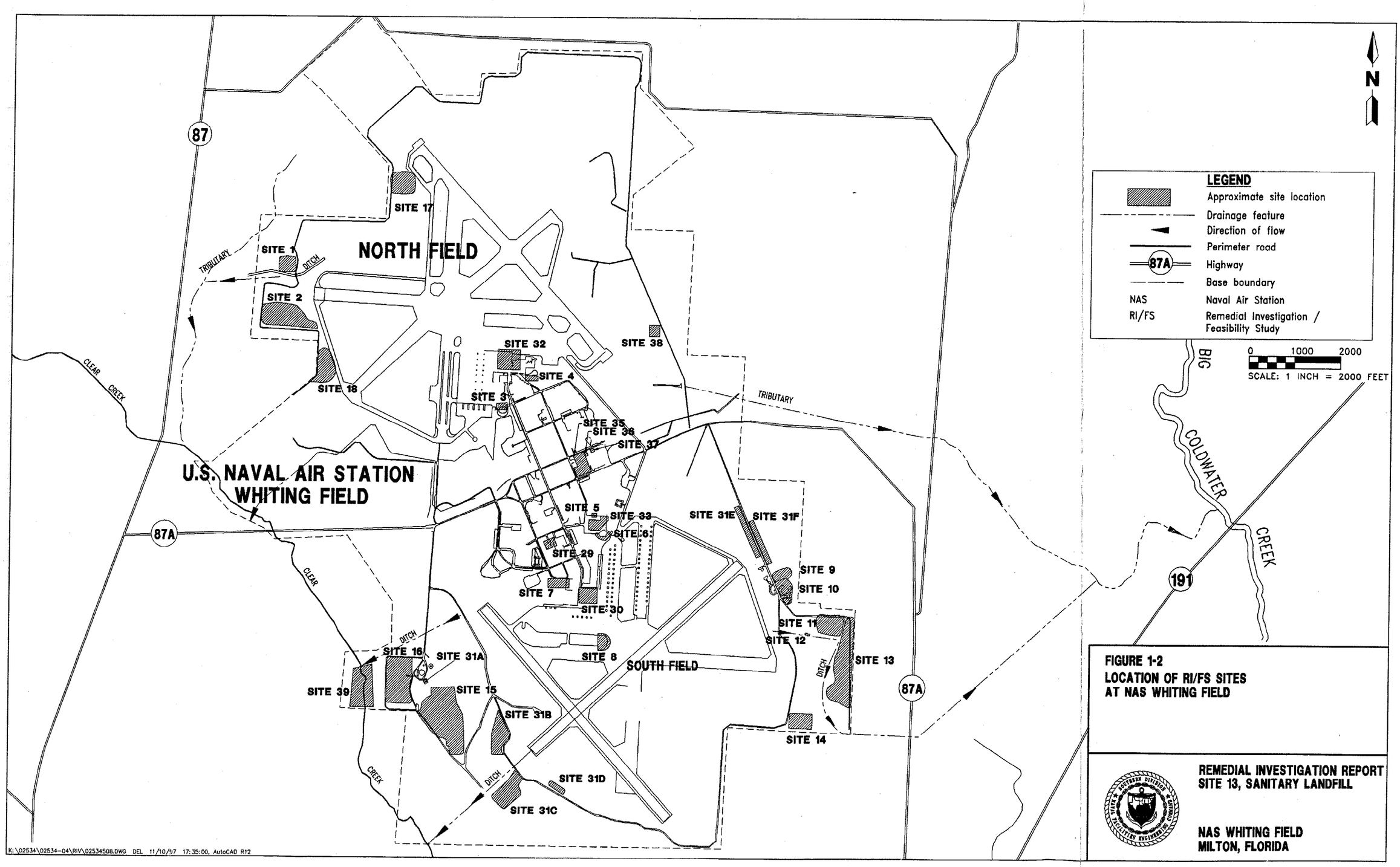

FIGURE 1-2
LOCATION OF RI/FS SITES AT NAS WHITING FIELD

REMEDIAL INVESTIGATION REPORT
SITE 13, SANITARY LANDFILL

NAS WHITING FIELD
MILTON, FLORIDA

00245D012

Currently, the site is predominantly covered with planted pine trees. Buried wastes are not exposed at the land surface, nor are there indications (e.g. stained soil or stressed vegetation) of other past waste disposal practices.

According to the U.S. Department of Agriculture (USDA), the soil at Site 13 is classified as Troup Loamy Sand and Lucy Loamy Sand (USDA, 1980). Because the soil at the site is predominantly silty sand, rainfall generally infiltrates directly into the soil.

1.3 REGULATORY SETTING. The Navy Installation Restoration (IR) program was designed to identify and abate or control contaminant migration resulting from past operations at naval installations. The IR program is the Navy response authority under Section 120 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986 and Executive Order 12580. SOUTHNAVFACENGCOM is the agency responsible for the Navy installation restoration program in the southeastern United States. Therefore, SOUTHNAVFACENGCOM has the responsibility to process NAS Whiting Field through preliminary assessment, site inspection, RI/FS, and remedial response selection in compliance with the guidelines of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 Code of Federal Regulations [CFR] 300) (U.S. Environmental Protection Agency [USEPA], 1990).

Section 105(a)(8)(A) of SARA requires USEPA to develop criteria to set priorities for remedial action for chemicals detected in environmental media based on relative risk to human health and the environment. To meet this requirement, USEPA has established the Hazard Ranking System (HRS) as Appendix A to the NCP. First promulgated in 1982, the HRS was amended in December 1990, effective March 14, 1991 (55 Federal Register No. 241:51532-51667), to comply with requirements of Section 105(c)(1) of SARA to increase the accuracy of the assessment of relative risk. The HRS (March 1991) has been substantially revised and is designed to prioritize sites after the Site Inspection phase of the CERCLA process.

The HRS score for NAS Whiting Field was generated in 1993. The score was sufficient to place NAS Whiting Field on the National Priority List (NPL). In January 1994, the USEPA placed NAS Whiting Field on a proposed list of sites to be included on the NPL (40 CFR 300, Federal Register, January 18, 1994), and on May 31, 1994, NAS Whiting Field was placed on the NPL effective June 30, 1994 (40 CFR 300, Federal Register, May 31, 1994). As a result, the RI/FS for NAS Whiting Field must follow the requirements of the NCP, as amended by SARA, and regulatory guidance for conducting RI/FS programs under CERCLA.

1.4 REPORT ORGANIZATION. The RI Report is organized into ten sections (Chapters 1.0 to 10.0). Chapter 1.0 presents the purpose, site description, and regulatory setting for the RI at NAS Whiting Field. Chapter 2.0 summarizes previous investigations. Chapter 3.0 presents the investigative methodology for conducting the assessment. Chapter 4.0 presents the site-specific data quality assessment. Chapter 5.0 discusses the investigative results of the assessment. Chapter 6.0 presents the Human Health Risk Assessment (HHRA), and Chapter 7.0 presents the Ecological Risk Assessment (ERA). Chapter 8.0 discusses the fate and transport of chemicals determined to be human and/or ecological chemicals of potential concern (CPC). Chapter 9.0 provides a summary of the conclusions and recommendations. Chapter 10.0 presents professional review certification.

2.0 PREVIOUS INVESTIGATIONS

Numerous investigations have been conducted at NAS Whiting Field prior to 1998. These investigations include an Initial Assessment Study (IAS), Verification Study, and Phases I, IIA, and IIB of the RI. This chapter summarizes the previous investigations specific to Site 13, the Sanitary Landfill Area at NAS Whiting Field.

2.1 INITIAL ASSESSMENT STUDY. Background information was gathered for the IAS (Envirodyne Engineers, Inc., 1985) by conducting a record search, performing an on-site survey, and conducting interviews with long-time employees and retired personnel familiar with the site.

Results of the IAS indicated that between 1979 and 1984, the site was the primary sanitary landfill for NAS Whiting Field. During its first year of operation, the landfill potentially received wastes associated with the maintenance of aircraft such as waste solvents, paint, oil, and hydraulic fluid. Asbestos wrapped in plastic was also disposed of at the landfill. After the first year of operation, the landfill received general refuse and nonhazardous waste (Envirodyne Engineers, Inc., 1985).

Site 13 was recommended for additional investigation during the IAS due to the potentially hazardous nature of the wastes reportedly disposed of there, and the high potential for migration and potential impact on receptors (Envirodyne Engineers, Inc., 1985).

2.2 VERIFICATION STUDY. The Verification Study (Geraghty & Miller, Inc., 1986), at Site 13 included installing a single monitoring well (WHF-13-1) east of Site 13 (Figure 3-3). A groundwater sample was collected and analyzed for the USEPA's list of priority pollutants. No organic constituents were detected in the groundwater, and low concentrations of lead (0.006 milligrams per liter [mg/ℓ]), mercury (0.0005 mg/ℓ), nickel (0.006 mg/ℓ), and zinc (0.24 mg/ℓ) were detected. These concentrations did not exceed Florida maximum contaminant levels (MCLs) in effect at the time of the investigation.

Based on groundwater elevations in the area including Site 13, groundwater flows in a southerly direction, and an additional monitoring well should be installed hydraulically downgradient of Sites 13 and 14.

3.0 FIELD INVESTIGATIVE METHODS

Field investigative techniques used to collect data during the RI are described in the RI/FS Workplan, Volume II (E.C. Jordan, 1990). The workplan includes descriptions of sampling methods, sample management, chain of custody, project documentation, change in field methods, protocols on corrective actions, decontamination procedures, waste management handling, and other general project standards and procedures in Section 3.1, General Site Operations.

Field and laboratory quality assurance (QA) and quality control (QC) requirements for the RI activities comply with the RI/FS Quality Assurance Project Plan (QAPP) located in Appendix A of the RI/FS Workplan, Volume II (E.C. Jordan, 1990). Health and safety requirements were in accordance with the general Health and Safety Plan located in Volume III the RI/FS planning document, NAS Whiting Field, Milton Florida (E.C. Jordan, 1990).

Field investigative methods not included in the documents identified above are described in Technical Memorandum No. 7, RI Phase IIB Workplan (ABB Environmental Service, Inc. [ABB-ES], 1995a) and in the NAS Whiting Field GIR (HLA, 1998).

These field and laboratory investigation techniques are in general conformance with USEPA standard operating procedures in effect at the time of the investigations (USEPA, 1991a and 1996a) and were followed during all phases of the RI sampling and analysis program.

The RI Phase I investigation at Site 13 consisted of collecting three groundwater samples using a piezocone penetrometer test (PCPT) and Bengt-Arne-Torstensson (BAT) sampler. The Phase IIA investigation included the completion of a geophysical survey, collection of five surface soil samples and three subsurface soil samples from test pits, installation of two monitoring wells, and collection of three groundwater samples. The Phase IIB investigation included an active soil gas survey, collection of five surface soil samples, installation of three monitoring wells, and collection of seven groundwater samples. The samples were analyzed for target compound list (TCL) volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyl (PCBs), and target analyte list (TAL) inorganic analytes.

The following provides a brief description of the number and types of environmental samples and the analytical methodology for the Phase II RI for Site 13, Sanitary Landfill.

3.1 GEOPHYSICAL SURVEY. Geophysical surveys at Site 13 were conducted between May 26 and June 14, 1992. The purpose of the geophysical surveys was to assess the lateral and vertical extent of the waste disposal area and locate buried metallic or nonmetallic objects that may indicate a potential waste disposal area. In addition, geophysical methods were used to locate possible underground utility lines, fuel distribution lines, and other anthropogenic obstructions to be avoided during other intrusive subsurface exploration activities.

Geophysical methods used at the site include electromagnetic (EM) induction and magnetometry (MAG). Blackhawk Geosciences, Inc., of Golden, Colorado was subcontracted by HLA to conduct the geophysical tasks. A technical report

describing the methodology, results, and conclusions of the geophysical survey was prepared in February 1993 (ABB-ES, 1993). The following paragraph presents a brief description of the geophysical field program.

Data from the EM and MAG surveys were collected along east to west grid lines established at two intervals: 20 feet apart from the baseline (southern site boundary) to 1,200 feet north of the baseline, and 40 feet apart from 1,200 feet north to 1,800 feet north of the baseline. The grid lines were orientated with a magnetic compass and measuring tape. Data were collected at stations located at 10-foot intervals along each grid line. These grid lines were later surveyed by a Florida-licensed surveyor. The location of the grid and the plotted geophysical data are presented on Figures A-1 through A-4 in Appendix A of this report. The results of the geophysical survey are presented in Section 5.3 of this report.

3.2 SOIL GAS SURVEY FOR METHANE. A soil gas survey was conducted in August and September, 1995, at Site 13 to assess the presence of methane gas or other VOCs potentially emanating from the site. A technical report summarizing the sampling methods and analytical results was prepared in November 1995 (ABB-ES, 1995b). Soil gas samples were collected from 98 locations across the site and up to 100 feet beyond the site boundary. Sample locations were determined based on a 100- by 100-foot grid spacing based on random origination points. The grid origin was located at an area assumed not to be influenced by soil gas emanating from the site. Figure 3-1 presents the locations of the active soil gas survey points.

At each location, an open-ended stainless-steel tube was pushed or manually driven to the proposed sampling depths of 1.5 feet and 3.0 feet below land surface (bls). Organic vapor measurements were made at the two sampling depths. The air within the stainless-steel tube was purged with a vacuum pump to obtain a representative sample of soil gas. Soil gases were drawn directly into Tedlar bags, from which the samples were drawn for analysis. Total volatile organic vapor concentrations were measured in the field with either a Portafid II™ or a Foxboro OVA-128™ organic vapor analyzer (OVA). Measurements of both total volatile organic vapor concentrations and methane (i.e., vapors measured after passing a granulated charcoal filter) were recorded. A comparison of the two measurements allowed a qualitative analysis of the presence of methane gas. Soil gas samples were not submitted for laboratory analysis.

The results of the soil gas survey are presented in Section 5.4 of this report. Methane concentrations are presented graphically as isoconcentrations on Figures 5-3 and 5-4.

3.3 SURFACE SOIL ASSESSMENT. The surface soil assessment included the collection of five surface soil samples during Phase IIA and five surface soil samples during Phase IIB of the RI.

The phase IIA soil samples designated 13-SL-01 through 13-SL-05 were collected from the interval between land surface to a depth of 12 inches bls at locations adjacent at the 5 test pits. The Phase IIA surface soil sample locations were based on observed surface conditions and co-located with geophysical surface anomalies. The Phase IIB samples (13S00101 through 13S00501) were collected to confirm the presence of chemicals previously detected, to provide full coverage

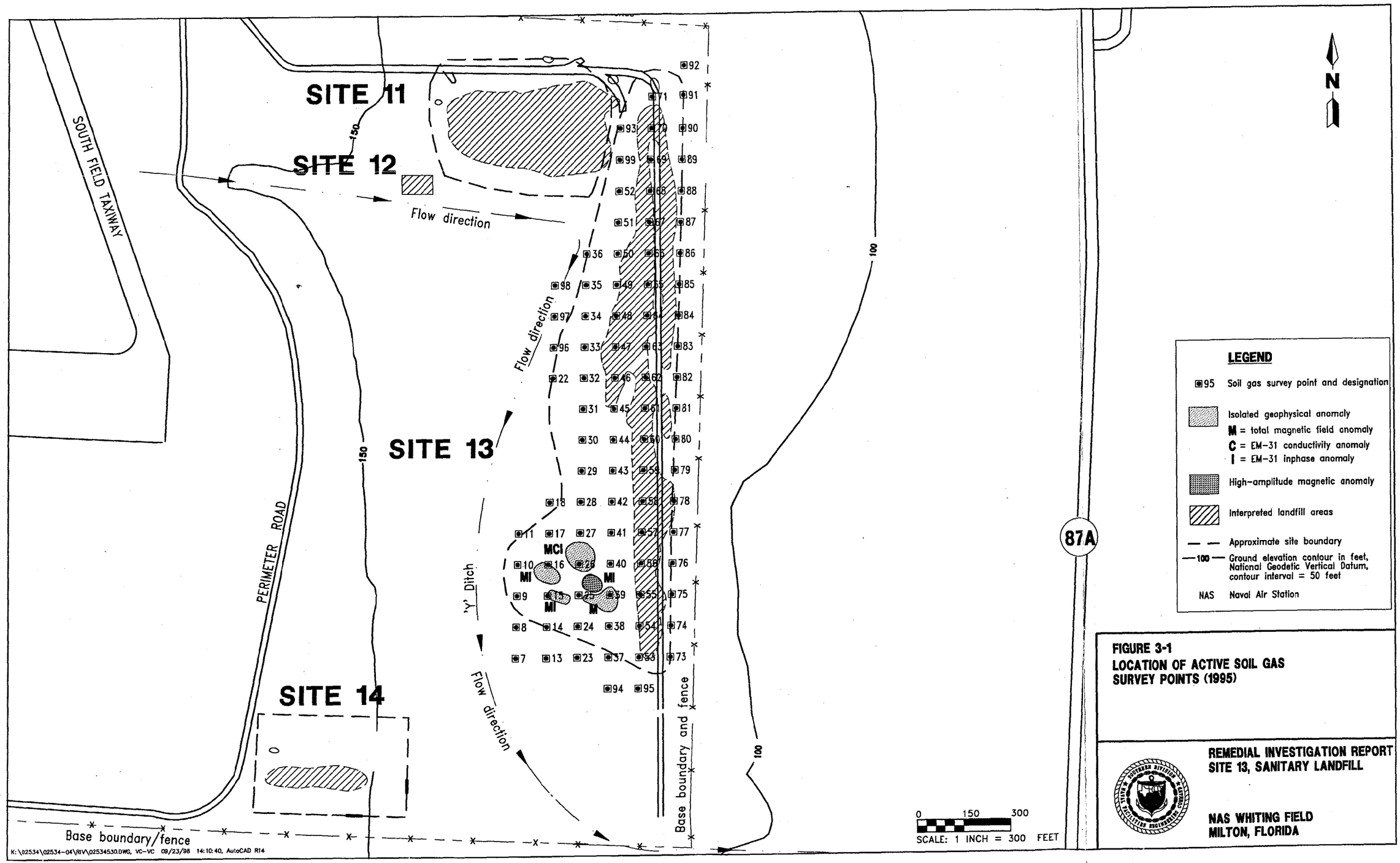

FIGURE 3-1
LOCATION OF ACTIVE SOIL GAS SURVEY POINTS (1995)

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of the site, and to characterize the nature and extent of contamination. The Phase IIB samples were collected in December 1995 and are shown on Figure 3-2.

The Phase IIB surface soil samples were collected from the land surface to a maximum depth of 12 inches bls using a decontaminated stainless-steel auger. Soil samples were described using the Unified Soil Classification System and recorded in a bound field logbook by HLA personnel.

The surface soil samples were analyzed for Contract Laboratory Program (CLP) (Naval Energy and Environmental Support Activity [NEESA] Level D) TCL VOCs, SVOCs, pesticides, PCBs, TAL inorganic analytes including cyanide, and asbestos.

Background screening criteria were established by collecting background samples across the installation from each USDA soil type identified at NAS Whiting Field. These data are presented in Subsection 3.3.1 of the GIR (HLA, 1998). The arithmetic mean of analytes detected in the background soil samples was calculated by summing individual analyte concentrations and then dividing the sum by the number of samples from which the analytes were detected. Surface soil sample analytical results were compared to twice the arithmetic mean of analyte concentrations detected in background surface soil samples associated with the Troup Loamy Sand and Lucy Loamy Sand soil types. The statistical summary for the combined surface soil type background data and the surface soil sampling results are discussed in Section 5.5 of this report. Soil sample analytical data are presented in Appendix B of this report.

3.4 SUBSURFACE SOIL ASSESSMENT. The RI subsurface investigation at Site 13 included a PCPT investigation, split-spoon sampling conducted during monitoring well installations, and sample collection during excavation of the test pits.

Detailed lithologic descriptions for all monitoring wells and PCPT soundings are presented in Phase I Technical Memorandum No. 1, Geologic Assessment (ABB-ES, 1992) and in Phase IIA Technical Memorandum No. 2, Geologic Assessment (ABB-ES, 1995c). A summary of the Site 13 lithology including descriptions from Phase IIB is also presented in Section 5.1 of this report. Boring logs for monitoring wells installed at Site 13 are included as Appendix C to this report.

Subsurface soil samples from Site 13 were compared to USEPA Region III Risk-Based Concentrations (RBCs), the Florida Soil Cleanup Target Levels for Chapter 62-785, Florida Administrative Code (FAC), and a background subsurface soil data set for NAS Whiting Field, presented in Subsection 3.3.1 of the GIR (HLA, 1998). Table 3-18 in the GIR presents a statistical summary of the background subsurface soil data at NAS Whiting Field (HLA, 1998).

3.4.1 Piezocone Penetrometer Investigation Two PCPT explorations (WHF-13-CPT-1 and WHF-13-CPT-2) were performed at Site 13 in December 1990. The PCPT explorations were each completed to total depths of 130 feet bls. The PCPT apparatus consists of a stainless-steel cone tip (equipped with electronic sensors and connected to stainless-steel rods) hydraulically pressed into the overburden soils. Measurements of end-bearing resistance, friction resistance, and pore pressure were recorded from the sensors throughout the sounding. The analog signals from the cone tip sensors were digitized for data logging, and analyses of the digital data were completed in the field using a data acquisition

software system. Based on the cone readings, a lithologic description of the soils was computed with the aid of the software package.

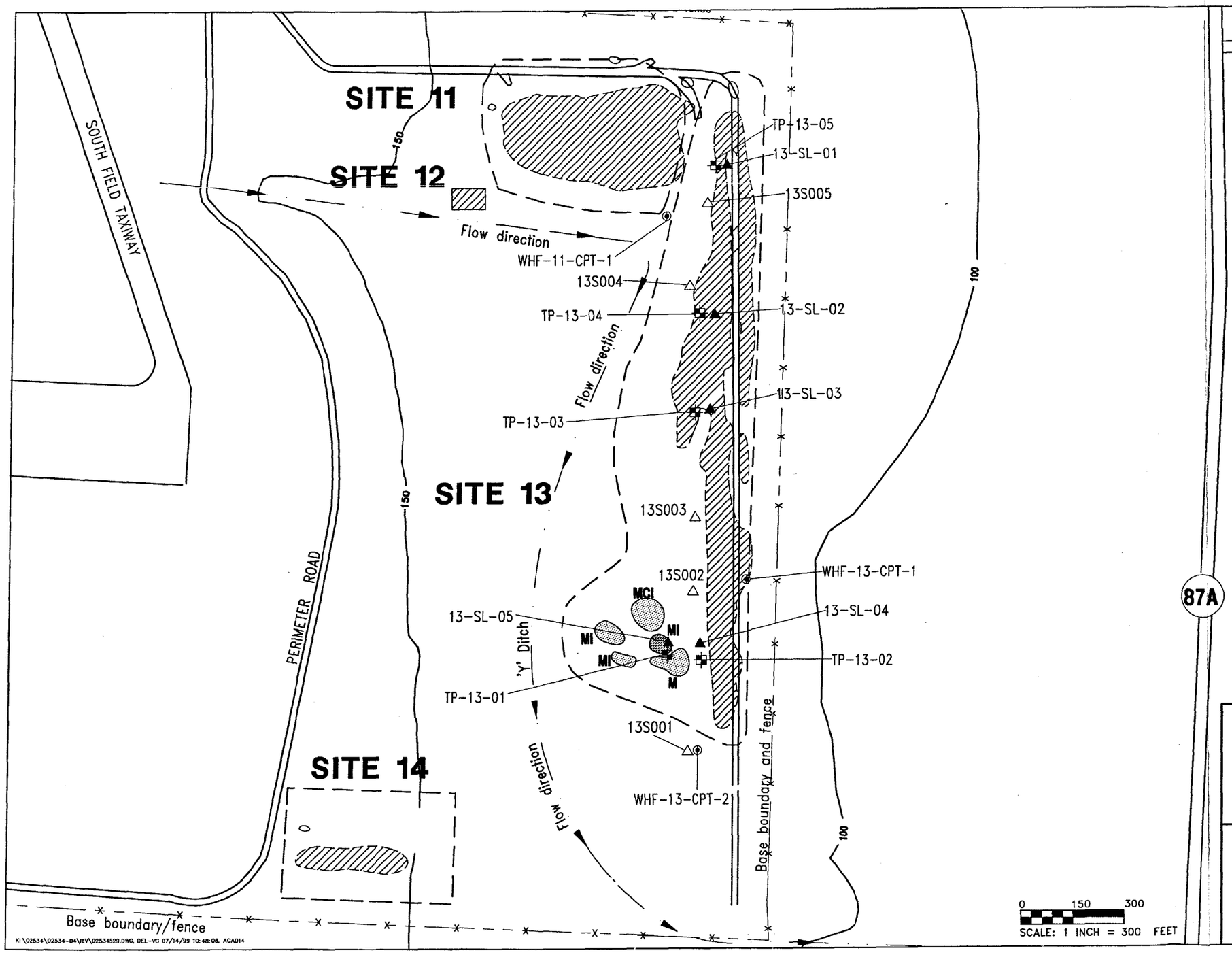
The cone tip was advanced until the friction resistance of the overburden soils exceeded the power of the hydraulic system (refusal); the exploration was then terminated. The primary purpose of extending the boring explorations was to collect *in situ* groundwater samples using the BAT screening technique. The BAT *in situ* groundwater sampling technique was described in Phase I Technical Memorandum No. 5, Groundwater Assessment (ABB-ES, 1995d). A summary of the sounding designations, completion dates, proposed and actual depths, and the lithologic descriptions for the soundings are presented in Phase IIA Technical Memorandum No. 2, Geologic Assessment (ABB-ES, 1995a).

3.4.2 Split Spoon Sampling Lithologic data were obtained by collecting subsurface soil samples at monitoring well locations (Figure 3-3). A 2-foot split-spoon sample was collected for visual inspection by an HLA geologist. All data were entered into a bound logbook. Detailed soil descriptions and other pertinent data are presented in the boring logs for the soil boring investigation located in Phase IIA Technical Memorandum No. 2, Geologic Assessment (ABB-ES, 1995c) and in Section 5.1 of this report. Split-spoon samples were generally collected at 5-foot intervals during drilling of the monitoring wells. Monitoring well installations were conducted in conjunction with the hydrogeologic and groundwater investigations, which are summarized in Phase IIA Technical Memoranda 4 and 5, respectively (ABB-ES, 1995d and 1995e).

3.4.3 Test Pit Sampling Five test pits (TP-13-01 through TP-13-05) were excavated in October 1992 at Site 13, following completion of the geophysical survey. Test pits were excavated at geophysical anomaly locations (which potentially indicated buried materials; Figure 3-2). The purpose of the test pits was to confirm the presence of buried wastes, and to characterize potential landfill materials by the description, collection, and analyses of subsurface samples. The analytical data were used to characterize potential environmental impacts to subsurface soil within the disposal area. A detailed description of the site selection and methodology of excavation is described in Phase IIA Technical Memorandum 3 (ABB-ES, 1995f).

The physical descriptions of each two foot soil layer and waste type were recorded in the field logbook during test pit excavation and summarized in Appendix B of Phase IIA Technical Memorandum 3 (ABB-ES, 1995f). Three subsurface soil samples (13SS0201, 13SS0302, and 13SS0503) were collected from three test pits (TP-13-02, TP-13-03, and TP-13-05) for analysis by a CLP analytical laboratory. No subsurface soil samples were collected from test pits that did not contain domestic or industrial wastes or other refuse. The subsurface soil samples were analyzed for TCL VOCs, SVOCs, pesticides, PCBs, and TAL metals and cyanide. The analytical data for subsurface samples are summarized in Section 5.6 of this report.

3.5 GROUNDWATER ASSESSMENT. Groundwater assessment activities included collecting two groundwater samples with a BAT sampler during Phase I and collecting groundwater samples from monitoring wells installed in Phases IIA and IIB.



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WHF-13-CPT-2	PCPT exploration and designation
TP-13-02	Phase IIA test pit location and designation
13-SL-03	Phase IIA surface soil sample and designation
13S004	Phase IIB surface soil sample and designation
	Isolated geophysical anomaly **M** = total magnetic field anomaly **C** = EM-31 conductivity anomaly **I** = EM-31 inphase anomaly
	High-amplitude magnetic anomaly
	Interpreted landfill areas
— —	Approximate site boundary
— 100 —	Ground elevation contour in feet, National Geodetic Vertical Datum, contour interval = 50 feet
NAS	Naval Air Station
PCPT	Piezocone penetrometer test

FIGURE 3-2
LOCATION OF SURFACE SOIL SAMPLES, TEST PITS, AND PCPT EXPLORATIONS

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NAS WHITING FIELD
MILTON, FLORIDA

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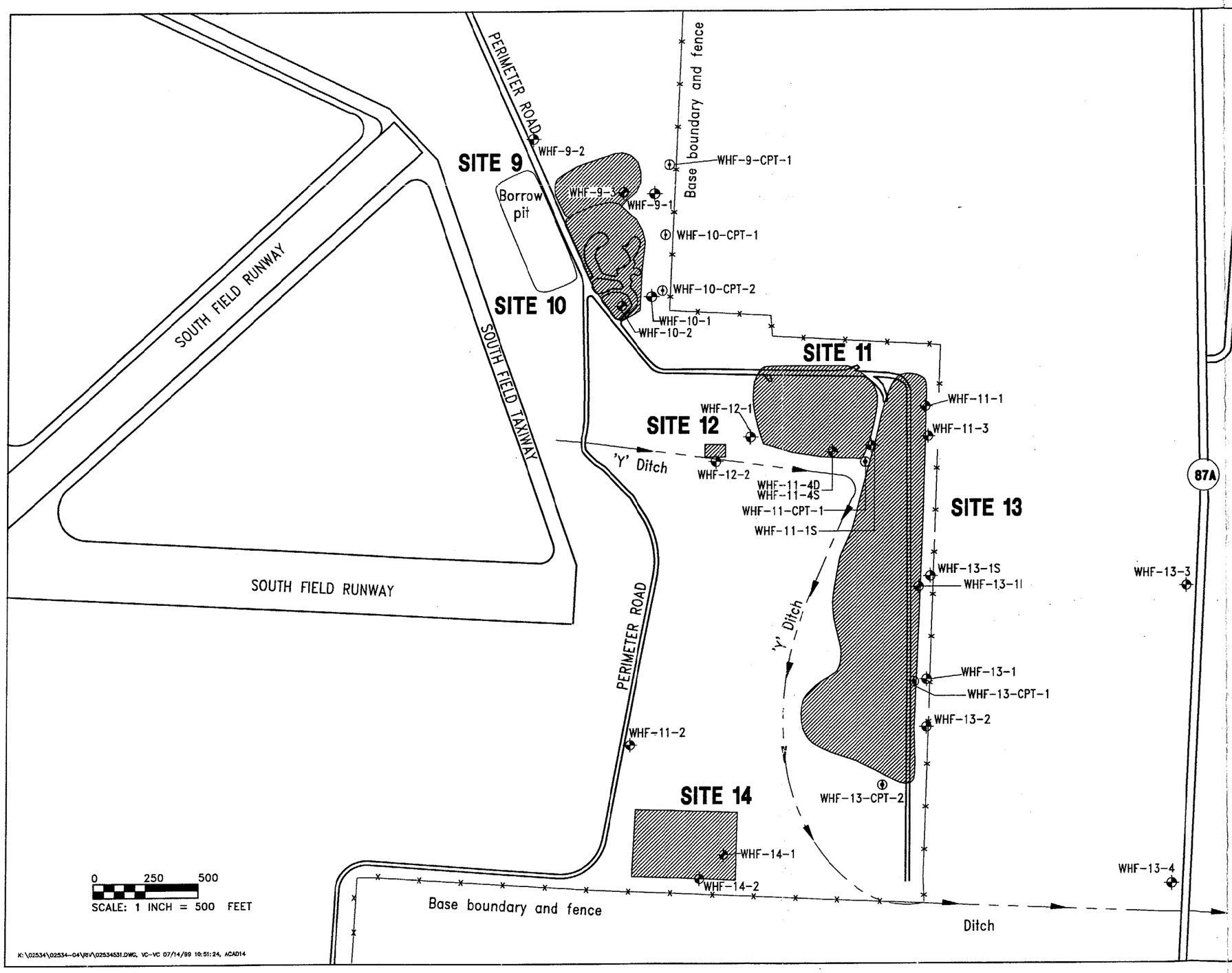

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WHF-13-3	Monitoring well location and designation
WHF-13-CPT-2	BAT sample location and designation
BAT	Bengt-Arne-Torstensson
	Approximate site location
NAS	Naval Air Station

FIGURE 3-3
LOCATION OF MONITORING WELLS AND BAT SAMPLES

REMEDIAL INVESTIGATION REPORT
SITE 13, SANITARY LANDFILL

NAS WHITING FIELD
MILTON, FLORIDA

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During the Phase I investigation, three groundwater samples (WHF-13-WP-01-01, WHF-13-WP-02-01, and WHF-13-WP-02-02) were collected at PCPT locations WHF-13-CPT-1 and WHF-13-CPT-2 (Figure 3-2) using the BAT sampling technique. The BAT groundwater sampling program was conducted in April 1991 in conjunction with the PCPT subsurface exploration to confirm the potential for contamination of groundwater hydraulically downgradient from the site. The depth of the *in situ* BAT groundwater samples were determined based on subsurface exploration data (lithology and pore pressure) collected from the PCPT soundings. The groundwater samples were analyzed for TCL VOCs and TAL inorganics. The analytical results are presented in Subsection 5.7.1 of this report.

As part of the Phase IIA investigation, groundwater samples WHF-13-1, WHF-13-2, and WHF-13-1B were collected from monitoring wells WHF-13-1S, WHF-13-2, and WHF-13-1B, respectively. Groundwater samples were collected from monitoring wells WHF-13-1 (samples 13G00103, and 13G00103F), WHF-13-1S (sample 13G00101), WHF-13-2 (13G00201) and an additional monitoring well, WHF-13-1I (sample 13G00102), installed in 1996 as part of the Phase IIB investigation. In 1997, two additional wells (WHF-13-3 and WHF-13-4) were installed and sampled (samples 13G00301, 13G00301F, and 13G00401, respectively). The monitoring well locations are presented on Figure 3-3, and the groundwater analytical data are discussed in Section 5.7. The groundwater analytical data are presented in Appendix D of this report.

During Phase IIA, the groundwater samples were collected from the monitoring well using a Teflon™ bailer after purging the monitoring wells with a submersible or bladder pump. Purging and sampling methodology was followed as presented in Paragraph 2.1.7.2 of the GIR (HLA, 1998). The groundwater samples were analyzed for CLP (NEESA Level C) TCL VOCs, SVOCs, pesticides, PCBs, and TAL inorganics.

During Phase IIB of the RI, groundwater samples were collected from the six monitoring wells installed at Site 13 using low-flow sampling techniques. Purging and sampling methodology was followed as presented in Paragraph 2.1.7.2 of the GIR (HLA, 1998). The groundwater samples were analyzed for CLP (NEESA Level D) TCL VOCs, SVOCs, pesticides, PCBs, and TAL inorganics. Samples for TAL inorganics were unfiltered (total analysis) if measured turbidity was below 10 nephelometric turbidity units (NTUs). If turbidity was greater than 10 NTUs, an additional groundwater sample was collected and field-filtered using a 45-micron filter. The purpose of the additional groundwater sample was to evaluate the nature of the nonparticulate inorganic analytes present in the samples. Two filtered samples (13G00103F and 13G00301F) were collected during Phase IIB.

Secondary water quality parameters were also analyzed to provide information for assessing potential remedial alternatives. The secondary parameter analyses included alkalinity, chloride, sulfates, hardness, ammonia nitrates, total Kjeldahl nitrogen, nitrate and nitrite, pH, phosphorous, total dissolved solids, and total organic carbon. Water quality parameter data are presented in Subsection 5.7.2 of this report.

3.6 HYDROGEOLOGIC ASSESSMENT. The hydrogeologic assessment of Site 13 also included data from five adjacent sites investigated during the RI field program. This area, also referred to as the Southeast Disposal Area, includes Site 9 (Waste Fuel Disposal Pit), Sites 10 and 11 (Southeast Open Disposal Areas A and B), Site 12 (Tetraethyl Lead Disposal Area), Site 13 (Sanitary Landfill), and

Site 14 (Short-Term Sanitary Landfill. The hydrogeologic field investigation activities included the collection of water-level data from 15 monitoring wells and conducting slug test analyses on five monitoring wells. Results of the Phase IIA hydrogeologic assessment are presented in Phase IIA Technical Memorandum No. 4, Hydrogeologic Assessment (ABB-ES, 1995d). Monitoring well construction details are presented in Table 3-1 and on the boring logs in Appendix C of this report. Results of the hydrogeologic assessment are summarized in Section 5.2 of this report.

Table 3-1
Summary of Monitoring Well Construction Details

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Monitoring Well Designation	RI Phase of Well Completion	Well Size (inches)	Land Surface Elevation (feet msl)	TOC Elevation (feet msl)	Total Well Depth (feet BTOC)	Approximate Screen Interval (feet BTOC)	Surface Casing Length (feet bls)
Southeast Disposal Area							
Site 9, Waste Fuel Disposal Pit							
WHF-9-1	VS	4	144.66	146.55	118.40	108 to 118	NA
WHF-9-2	I	4	158.11	161.07	124.35	114 to 124	NA
WHF-9-3S	IIA	2	147.92	150.85	108.24	93 to 108	0 to 77
Site 10, Southeast Open Disposal Area (A)							
WHF-10-1	VS	4	144.19	146.73	118.20	108 to 118	NA
WHF-10-2	IIA	2	147.78	150.75	113.14	98 to 113	NA
Site 11, Southeast Open Disposal Area (B)							
WHF-11-1	VS	4	122.48	124.86	128.40	118 to 128	NA
WHF-11-1S	IIA	2	114.91	116.65	54.40	39 to 54	NA
WHF-11-2	I	4	145.19	148.12	125.84	120 to 125	NA
WHF-11-3	IIA	2	114.29	117.19	73.16	58 to 73	0 to 46
WHF-11-4S	IIB	2	126.13	129.43	76.00	60 to 75	NA
WHF-11-4I	IIB	2	125.79	129.28	106.00	95 to 105	NA
Site 12, Tetraethyl Lead Disposal Area							
WHF-12-1	VS	4	134.20	136.40	113.40	103 to 113	NA
WHF-12-2	IIB	2	132.45	135.56	85.00	69 to 84	NA
Site 13, Sanitary Landfill							
WHF-13-1	VS	4	100.40	102.66	122.90	112 to 122	NA
WHF-13-1S	IIA	2	104.61	108.97	61.30	46 to 61	NA
WHF-13-1I	IIB	2	106.09	109.17	91.00	80 to 90	NA
WHF-13-2S	IIA	2	99.94	102.86	72.41	57 to 72	0 to 42
WHF-13-3S	IIB	2	81.38	81.44	42.00	26 to 41	NA
WHF-13-4S	IIB	2	80.41	80.37	42.00	26 to 41	NA
Site 14, Short-Term Sanitary Landfill							
WHF-14-1	VS	4	137.83	139.69	153.20	143 to 153	NA
WHF-14-2	IIA	2	142.15	145.80	118.30	103 to 118	0 to 94

Notes: RI = Remedial Investigation.
msl = mean sea level.
TOC = top of casing.
BTOC = below top of casing.
bls = below land surface.
VS = Verification Study.
NA = not applicable.
I = Remedial Investigation Phase I.
IIA = Remedial Investigation Phase IIA.
IIB = Remedial Investigation Phase IIB.

4.0 SITE-SPECIFIC DATA QUALITY ASSESSMENT

This section describes how the data generated during Phase IIB of the RI at Site 13 were managed and evaluated. Section 4.1 describes the analytical program and data management for the RI at Site 13. Section 4.2 summarizes the precision, accuracy, representativeness, comparability, and completeness (PARCC) report on the data. Section 4.3 presents a summary of the Data Quality Assessment.

The soil samples collected during Phase IIA of the RI were qualified according to USEPA functional guidelines for evaluation of organic (USEPA, 1991b) and inorganic (USEPA, 1988a) analytical data analyzed using USEPA CLP protocol. The data quality objective (DQO) assessment for the Phase IIA soil samples is presented in detail in RI Phase IIA Technical Memorandum No. 3 (ABB-ES, 1994). The DQO assessment for the Phase IIA groundwater samples is presented in detail in RI Phase IIA Technical Memorandum No. 5 (ABB-ES, 1995e).

4.1 ANALYTICAL PROGRAM. Environmental and QC samples collected during the Phase IIB of the RI at Site 13 were analyzed using field screening and off-site laboratory analytical methods. QC data for Site 13 are included with sample delivery groups (SDGs) WF007, WF029, WF041, and WF055 and are presented in Appendix E. Environmental sampling locations are presented in Chapter 3.0 of this report, and sample results are presented in Chapter 5.0 and Appendix B (soil analytical data) and Appendix D (groundwater analytical data).

Environmental samples (surface soil and groundwater) were collected and analyzed by an off-site laboratory using USEPA CLP methodology for analysis of TCL VOCs, SVOCs, pesticides, and PCBs, and TAL metals and cyanide. Some groundwater samples were also analyzed for wet chemistry analyses. The laboratory analytical program is described in more detail in Section 2.2 of the NAS Whiting Field GIR (HLA, 1998).

Analytical results obtained for all environmental samples during the RI sampling events were submitted as NEESA Level D (USEPA Level IV) analytical packages for VOCs, SVOCs, pesticides, PCBs, metals, cyanide, and wet chemistry.

4.2 DATA REVIEW. Data validation is the technical review of individual analytical results relative to the following criteria:

- DQOs and the QAPP in the NAS Whiting Field Workplan (E. C. Jordan Co., Inc., 1990 and ABB-ES, 1995a);
- NEESA guidance document 20.2-047B, *Sampling and Chemical Analysis Quality Assurance Requirements for the Navy Installation Program* (NEESA, 1988);
- USEPA, *Contract Laboratory Program National Functional Guidelines for Organic Data Review*, February 1994 (USEPA, 1994a); and
- USEPA, *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, February 1994 (USEPA, 1994b).

The data validation process is described in Section 2.3 of the NAS Whiting Field GIR (HLA, 1998).

The data were reviewed, validated, and evaluated using the PARCC criteria specified in the DQOs. PARCC criteria are described in Section 2.3 of the NAS Whiting Field GIR (HLA, 1998). The Site 13 Phase IIB soil and groundwater analytical data were validated by Laboratory Data Consultants, Inc. (LDC), of Carlsbad, California, in 1996. The Site 13 Phase IIB surface soil data are included in SDG WF007. The Site 13 Phase IIB groundwater data include SDGs WF029, WF041, and WF055. The subsections below summarize the PARCC criteria evaluation of the analytical data.

4.2.1 Precision Precision is a measure of the agreement or repeatability of a set of replicate results (relative percent difference, [RPD]) obtained from duplicate laboratory analyses of samples collected from the same location and depth interval. Precision for analytical data collected during the RI sampling events was evaluated using results of field duplicate samples. The evaluation of precision for the RI sampling event is presented in Table 4-1 and summarized below.

The RPD criteria were not met for five environmental samples (two soil and three groundwater) and associated duplicates for several organic and inorganic analytes. None of the organic analytical results were qualified during the data validation process based on RPD criteria for environmental and associated duplicate sample pairs.

The RPD criteria for several organic compounds (2 VOCs and 14 SVOCs) in two soil samples from SDG WF007 may not have been met because of sample heterogeneity. The inorganic analytical results were not qualified during the data validation process based on the RPD evaluation criteria alone.

The RPD criteria for seven inorganic analytes in two soil samples from SDG WF007 may not have been met because of sample heterogeneity. The inorganic analytical results were not qualified during the data validation process based on the RPD evaluation criteria alone.

The RPD criteria for three VOCs and four inorganic analytes were not met for a groundwater sample (14G00101) and associated duplicate in SDG WF029. The RPD criteria for one VOC and two inorganics were not met for one groundwater sample (35G00101) and its associated duplicate in SDG WF041. The RPD criteria for one VOC, one SVOC, and four inorganic analytes were not met for one groundwater sample (35G00202) and its associated duplicate in SDG WF041.

4.2.2 Accuracy Accuracy is a measure of the agreement between the true value and the value measured using an analytical method (percent recovery). Accuracy also is evaluated during data validation by assessing initial and continuing calibration data for the analytical instrument. Accuracy for analytical data collected during the RI sampling events was assessed by evaluating percentage recoveries for MS/MSD samples, surrogate recoveries, laboratory control samples, and initial and continuing calibration standard results. The evaluation of recoveries for MS/MSD samples is presented in Table 4-2 and summarized below.

Table 4-1
Precision Summary for Soil and Groundwater Field Duplicate Samples

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

SDG Number	Sample ID	Compound	Sample Concentration	Duplicate Concentration	RPD	Control Limits
SOIL						
WF007						
Volatile Organic Compounds (µg/kg)	14S00101	Acetone	8	ND	NC	50
		Methylene chloride	6	ND	NC	50
Semivolatile Organic Compounds (µg/kg)	10S00101	Phenanthrene	280	1,200	124	50
		Fluoranthene	660	2,300	111	50
		Pyrene	580	1,600	94	50
		Benzo(a)anthracene	340	1,200	112	50
		Chrysene	500	1,400	120	50
		Bis(2-ethylhexyl)phthalate	200	360U	NC	50
		Benzo(b)fluoranthene	480	1,300	92	50
		Benzo(k)fluoranthene	360	900	86	50
		Benzo(a)pyrene	400	1,000	86	50
		Indeno(1,2,3-cd)pyrene	180	360	67	50
		Benzo(g,h,i)perylene	180	340	62	50
		Anthracene	370 U	270	NC	50
		Carbazole	370 U	100	NC	50
		Dibenz(a,h)anthracene	370 U	170	NC	50
Inorganic Analytes (mg/kg)	10S00101	Aluminum	8,760	8,920	2	20
		Arsenic	2.5	2.6	4	30
		Barium	361	1,320	114	30
	10S00101	Beryllium	0.13	0.13	0	20
		Cadmium	0.91	ND	NC	20

See notes at end of table.

Table 4-1 (Continued)
Precision Summary for Soil and Groundwater Field Duplicate Samples

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

SDG Number	Sample ID	Compound	Sample Concentration	Duplicate Concentration	RPD	Control Limits
SOIL						
WF007						
Inorganic Analytes (mg/kg) (Continued)		Calcium	23,200	17,800	26	20
		Chromium	18.2	16.8	8	30
		Cobalt	0.83	2.0	82	30
		Copper	7.9	7.9	0	30
		Iron	6,520	6,780	4	20
		Lead	38.0	33.1	14	20
		Magnesium	5,910	5,600	5	30
		Manganese	56.6	66.0	15	20
		Nickel	6.8	3.0	77	30
		Potassium	219	ND	NC	20
		Sodium	35.6	46.2	26	30
		Vanadium	18.9	18.7	1	30
		Zinc	37.7	34.1	5	30
		Cyanide	0.10	0.20	67	30
		TRPH	240	180	29	30
	14S00101	Aluminum	11,600	11,500	1	20
		Arsenic	1.5	1.9	23	30
		Barium	23.3	26.6	13	30
		Beryllium	0.15	0.16	6	30
		Calcium	120	183	6	30
		Chromium	7.8	7.8	0	30
		Cobalt	1.8	1.6	12	30
		Copper	3.8	4.3	12	30

See notes at end of table

Table 4-1 (Continued)
Precision Summary for Soil and Groundwater Field Duplicate Samples

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

SDG Number	Sample ID	Compound	Sample Concentration	Duplicate Concentration	RPD	Control Limits
SOIL						
WF007						
Inorganic Analytes (mg/kg) (Continued)		Iron	6,310	6,630	5	20
		Lead	7.7	11.9	42	30
	14S00101	Magnesium	177	162	9	30
		Manganese	521	597	14	30
		Mercury	0.04	0.04	0	30
		Nickel	4.1	4.6	12	30
		Potassium	144	ND	NC	30
		Sodium	16.4	14.0	16	30
		Vanadium	16.8	17.4	6	30
		Zinc	6.0	6.6	10	30
		Cyanide	0.07	ND	NC	30
GROUNDWATER						
WF029						
Volatile Organic Compounds (µg/ℓ)	14G00101	Acetone	8	4	67	40
		Carbon disulfide	3	10 U	NC	40
		Methylene chloride	1	10 U	NC	40
Semivolatile Organic Compounds (µg/ℓ)	14G00101	Bis(2-ethylhexyl)phthalate	4	4	0	40
Inorganic Analytes (µg/ℓ)	14G00101	Aluminum	33.1	26.5	22	25
		Arsenic	0.50	0.50 U	NC	25
		Barium	22.3	22.3	0	25
		Calcium	3,060	2,870	6	25
		Iron	22.0	27.3	22	25
		Lead	1.3	0.80	48	25
		Magnesium	702	691	2	25

See notes at end of table

Table 4-1 (Continued)
Precision Summary for Soil and Groundwater Field Duplicate Samples

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

SDG Number	Sample ID	Compound	Sample Concentration	Duplicate Concentration	RPD	Control Limits
Inorganic Analytes (μg/ℓ) (Continued)	14G00101	Manganese	1.9	1.9	0	25
		Mercury	0.12	0.10 U	NC	25
		Sodium	1,590	1,570	1	25
		Vanadium	1.2 U	1.4	NC	25
		Zinc	89.5	96.8	8	25
WF041						
Volatile Organic Compounds (μg/ℓ)	35G00101	1,1-dichloroethene	6	7	15	40
		1,1,1-trichloroethane	2	2	0	40
		Xylenes (total)	2	1	67	40
	35G00202	Chloroform	3	3	0	40
Semivolatile Organic Compounds (μg/ℓ)	35G00202	Bis(2-ethylhexyl)phthalate	10 U	5	NC	40
Inorganic Analytes (μg/ℓ)	35G00101	Aluminum	47.8	45.2	6	25
		Barium	78.8	79.0	0.2	25
		Calcium	3,150	3,240	3	25
		Copper	8.2	6.8	19	25
		Iron	15.9	19.0	18	25
		Magnesium	2,430	2,370	1	25
		Manganese	28.7	28.9	0.7	25
		Sodium	4,330	4,430	2	25
		Thallium	1.9	0.89 U	NC	25
		Zinc	12.1	130	168	25
	35G00202	Aluminum	65.0	50.7	25	25
		Barium	24.8	25.3	2	25
		Calcium	973	1,030	6	25
		Copper	5.6	3.5	46	25
		Iron	180	196	8	25

See notes at end of table.

Table 4-1 (Continued)
Precision Summary for Soil and Groundwater Field Duplicate Samples

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

SDG Number	Sample ID	Compound	Sample Concentration	Duplicate Concentration	RPD	Control Limits
Inorganic Analytes (μg/ℓ) (Continued)	35G00202	Lead	0.93 U	1.9	NC	25
		Magnesium	813	819	0.7	25
		Manganese	9.5	9.3	2	25
		Selenium	1.8 U	2.6	NC	25
		Sodium	20,900	21,700	4	25
		Thallium	1.0	0.89 U	NC	25
		Zinc	18.7	15.4	19	25

Notes: SDG = sample delivery group.
ID = identification.
RPD = relative percent difference.
μg/kg = micrograms per kilogram.
ND = nondetect.
NC = not calculable.
U = undetected.
mg/kg = milligrams per kilogram.
TRPH = total recoverable petroleum hydrocarbons.
μg/ℓ = micrograms per liter.
D_1 = sample concentration.
D_2 = duplicate concentration.

$$RPD = 100 \times \frac{|D_1 - D_2|}{0.5(D_1 + D_2)} \quad (1)$$

Table 4-2
Accuracy Summary for MS/MSD Samples

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

SDG Number	MS/MSD Sample	Analyte	% Recovery MS/MSD	Control Limits
WF007 - Soil				
Semivolatile Organic Compounds	10S00101	4-Chloro-3-methylphenol	111/--	26 to 103
Inorganic Analytes[1]	10S00101	Antimony	65.5	75 to 125
		Barium	171.0	75 to 125
		Manganese	130.0	75 to 125
		Lead	128.7	75 to 125
		Selenium	56.1	75 to 125
WF029 - Groundwater				
Semivolatile Organic Compounds	14G00101	4-Nitrophenol	88/91	10 to 80
		Pentachlorophenol	--/106	9 to 103
WF041 - Groundwater				
Pesticides and PCBs	35G00101	Aldrin	124/121	40 to 120

[1] MSD analyses are generally not performed for inorganic analysis and, therefore, only the percent recovery for the MS is reported.

SDG = sample delivery group.
MS/MSD = matrix spike and matrix spike duplicate.
% = percent.
-- = not detected.
PCB = polychlorinated biphenyl.

The percent recovery for some of the soil and groundwater samples was above or below the target range; therefore, some analytical results may be biased high or low. Some of the analytical results for three SVOCs, one pesticide compound, and five inorganic analytes were qualified based on the evaluation of percent recovery.

A summary of the surrogate spike samples and the surrogate compounds outside control limits for the Phase IIB samples collected at Site 13 is presented in Table 4-3. The required control limits were also identified for each surrogate compound. All the samples associated with these surrogates were qualified in accordance with the USEPA functional guidelines as presented in Subsection 3.3.4 of the GIR (HLA, 1998).

Table 4-3
Accuracy Summary for Surrogate Recoveries Outside QC Criteria

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

SDG Number	Sample ID	Spiked Analyte	Surrogate Recovery (%R)[1]	QC Limits (percent)
WF007	10R00101	Decachlorobiphenyl	54/	60-150
WF029	13G00101	Decachlorobiphenyl	23/23	60-150
WF029	66G00901	Decachlorobiphenyl	43/42	60-150
WF029	66G00903	Decachlorobiphenyl	52/52	60-150
WF041	35G00201	Decachlorobiphenyl	58/	60-150
WF041	36G00103	Tetrachloro-m-xylene	57/58	60-150

[1] Reported as value for first column/second column.

Notes: QC = quality control.
SDG = sample delivery group.
ID = identification.
%R = percent recovery.

Initial calibrations are performed to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the volatile TCL. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear calibration curve. Continuing calibrations are performed to ensure that the instrument is capable of producing acceptable qualitative and quantitative data.

Continuing calibration establishes the 12-hour Relative Response Factor (RRF) on which the quantitations are based and checks satisfactory performance of the instrument on a day-to-day basis. Initial and continuing calibrations for organic analysis are measured by the percent Relative Standard Deviation (%RSD) for initial calibrations and the percent Difference (%D) for continuing calibrations. For inorganic analysis, the initial calibration verification and continuing calibration verification are measured.

Table 4-4 summarizes the initial and continuing calibration details for the surface soil and groundwater samples collected at Site 13.

Table 4-4
Summary of Initial and Continuing Calibration for Site 31 Samples

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

SDG	Date	Compound	Initial Calibration	Continuing Calibration	Qualifier
WF007	12/12/96	Dimethylphthalate	--	27.1	UJ
	12/15/96	Nitrobenzene	--	25.6	UJ
		Pentachlorophenol	--	29.6	UJ
	12/15/96	Nitrobenzene	--	30.8	UJ
		2,4-Dinitrophenol	--	41.8	UJ
		4,6-Dinitro-2-methylphenol	--	30.1	UJ
		Pentachlorophenol	--	29.8	UJ
		Benzo(k)fluoranthene	--	26.5	UJ
WF029	9/17/96	Chloromethane	--	38.1	J
		Methylene chloride	--	33.6	J
	9/18/96	2-Hexanone	--	26.5	J
	9/26/96	Benzo(k)fluoranthene	--	28.5	J
		Benzo(k)fluoranthene	--	25.6	J
WF041	6/11-12/97	Methoxychlor	24.2	--	J
		delta-BHC	21.5	--	J

Notes: Calibration values expressed as percent recovery.

SDG = sample delivery group.
-- = not detected.
UJ = The analyte was not detected above the reported sample instrument detection limit (IDL); however, the reported concentration is approximate and may not reliably be presumed to be less than the IDL value.
BHC = benzene hexachloride.
J = The analyte was positively identified and is reported as an approximate concentration.

The evaluation of the %RSD for the initial calibrations and the %D for the continuing calibrations indicates the response factors for the system performance check compounds generally met the required criteria for VOCs, SVOCs, pesticides, and PCBs. Analytes exhibiting an RRF not meeting the minimum requirements were qualified as J/UJ.

4.2.3 Representativeness Representativeness is the degree to which the data obtained from an environmental sample accurately reflect the presence or absence of contamination at a site. Field QC samples (including source water blanks, equipment rinse blanks, and trip blanks) and laboratory QC samples (including method [organic analysis] and preparation blanks [inorganic analysis]) were used to assess representativeness. Representativeness also is assessed by review of the adherence to extraction and analysis holding times. The evaluation of representativeness in field QC samples for the RI sampling event is presented in Table 4-5 and summarized below.

Trip Blanks. Acetone was detected in three of the four trip blank samples at concentrations ranging from 2 to 6 micrograms per liter ($\mu g/\ell$). Methylene chloride was detected in two of the four trip blank samples at concentrations ranging from 1 to 2 $\mu g/\ell$. Environmental samples associated with the trip blanks with results greater than the instrument detection limit (IDL) but less than 10 times the amount detected in the trip blank were appropriately annotated with a J or UJ qualifier (LDC, 1996).

Rinsate Blanks. Acetone (3 $\mu g/\ell$) was detected in one of the three rinsate blanks. Two SVOCs, bis(2-ethylhexyl)phthalate (BEHP) and di-*n*-butylphthalate, were detected in one or more of the rinsate blank samples. Di-*n*-butylphthalate, if present, was not detected in associated samples at concentrations exceeding the detection limits. BEHP was detected at similar concentrations in associated samples. Environmental samples associated with the field blank with results greater than the IDL but less than 10 times the amount detected in the field blank were appropriately annotated with a UJ qualifier.

Metals detected at concentrations exceeding the IDL and less than the contract-required detection limits are aluminum, barium, beryllium, calcium, copper, iron, sodium, and zinc.

Laboratory Method and Preparation Blanks. One VOC (acetone) was detected in one or more of the laboratory method blanks associated with the SDGs for Site 13. Three SVOCs (BEHP, di-*n*-butylphthalate, and di-*n*-octylphthalate] were detected one or more of the laboratory method blanks associated with SDGs for Site 13.

Environmental samples associated with method blanks that contained acetone with results greater than IDL but less than 10 times the amount detected in the laboratory preparation blanks were annotated with a UJ qualifier (LDC, 1996).

Seventeen inorganic analytes (aluminum, barium, beryllium, calcium, cobalt, copper, iron, lead, magnesium, mercury, selenium, silver, sodium, thallium, vanadium, zinc, and cyanide) were detected in one or more of the laboratory method blanks. Sample results greater than IDL but less than five times

Table 4-5
Representativeness Summary for Site 13 Field Quality Control Samples

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	13T00101	10R00101	13R01701	13T02301	13T04801	13R04201	OWT08001
Sample Type:	Trip Blank	Rinsate Blank	Rinsate Blank	Trip Blank	Trip Blank	Rinsate Blank	Trip Blank
Collection Date:	8-DEC-95	7-DEC-95	11-SEPT-96	09-SEPT-96	16-JUN-97	28-OCT-97	27-OCT-97
Laboratory Sample No.:	G8895001	G8889009	RC092008	RC092001	MD985001	MF004005	MF004001
Volatile Organic Compounds (μg/ℓ)							
Acetone	4	--	3	2	6	--	--
Methylene chloride	--	--	--	1	2	--	--
Semivolatile Organic Compounds (μg/ℓ)							
Di-*n*-butylphthalate	NA	15	5	NA	NA	--	NA
bis(2-Ethylhexyl)phthalate	NA	--	1	NA	NA	--	NA
Pesticides and PCBs (μg/ℓ)							
None detected							
Inorganic Analytes (μg/ℓ)							
Aluminum	NA	52.3	--	NA	NA	--	NA
Barium	NA	0.70	--	NA	NA	--	NA
Beryllium	NA	0.25	--	NA	NA	--	NA
Calcium	NA	23.0	66.4	NA	NA	--	NA
Copper	NA	7.1	--	NA	NA	--	NA
Iron	NA	67.3	--	NA	NA	--	NA
Sodium	NA	--	25.4	NA	NA	--	NA
Zinc	NA	17.6	1.8	NA	NA	--	NA

Notes: μg/ℓ = micrograms per liter.
-- = analyte not detected.
NA = not analyzed.
PCB = polychlorinated biphenyl.

the amount detected in the laboratory preparation blanks were appropriately annotated with a J or UJ qualifier (LDC, 1996).

Sampling and analysis holding times for each analytical fraction were met in all samples.

Qualification of the environmental samples was required because of the detection of target analytes in laboratory and field blanks. Qualification of the RI data, based on blank contamination, was performed according to USEPA data validation guidelines (USEPA, 1994a and USEPA, 1994b).

4.2.4 **Comparability** Comparability is the confidence with which one data set can be compared with another and the degree to which the environmental data from each sampling event are considered equivalent. Comparability of the analytical data was ensured by using standard operating procedures for sample collection, by using standard chemical analytical methods, and by reporting the analytical results in standard units (SUs). The sampling, shipment, and analytical protocols were consistent with USEPA standard operating procedures and methodologies described in work plans for NAS Whiting Field throughout the period of the RI.

4.2.5 **Completeness** Completeness is the percentage of useable data reported and validated compared with the total number of measurements made. Useable data are those measurements not rejected (qualified with an "R") during the validation process. No analytical data from the SDGs associated with Site 13 was rejected. The goal for analytical completeness for the RI sampling event was 85 percent useable data. The completeness goal of 85 percent was met for all matrices and all parameters.

4.3 **SUMMARY**. Based on the results of the QC sample analyses, the established precision and accuracy goals of the project were achieved (Table 4-6). Some field- and/or laboratory-derived contamination was present in some of the QC samples, which required the results from some of the environmental samples to be amended. QC sample results and data validation criteria indicate a 100 percent completeness was achieved for SDGs WF007, WF029, WF041, and WF055. Standard methods of analysis and units of measure were used throughout the project, thus meeting the QC criteria and the DQOs presented in the work plan.

Overall, the data generated during the sampling event meet established DQOs and are acceptable for use in site characterization, risk assessment, and evaluation of corrective measures.

Table 4-6
Summary of DQO Assessment - PARCC Parameters

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

	Precision[1]	Accuracy[2]	Representativeness	Completeness (%)	Comparability
Surface and Subsurface Soil Samples					
TCL VOCs	Acceptable	Acceptable	Acceptable	100	Acceptable
TCL SVOCs	Acceptable	Acceptable	Acceptable	100	Acceptable
Pesticides and PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
TAL Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable

[1] Cumulative of sampling and analytical components.
[2] Analytical component.

Notes: Includes sample delivery groups WF007, WF029, WF041, and WF055.
All the units are expressed as the ratio of number of analytes meeting the quality control criteria to the total number of analytes.

DQO = data quality objective.
PARCC = precision, accuracy, reproducibility, completeness, and comparability.
% = percent.
TCL VOC = target compound list volatile organic compound.
TCL SVOC = target compound list semivolatile organic compound.
PCB = polychlorinated biphenyl.
TAL = target analyte list.

5.0 INVESTIGATIVE RESULTS

The RI Phase I investigation (ABB-ES, 1992) at Site 13 consisted of collecting three groundwater samples using a PCPT and BAT sampler. The Phase IIA investigation included the completing of a geophysical survey, collecting five surface soil samples and three subsurface soil samples from test pits, installing two monitoring wells, and collecting three groundwater samples. All samples were analyzed for TCL VOCs, SVOCs, pesticides, PCBs, and TAL inorganic analytes.

The Phase IIB investigation included an active soil gas survey, collecting five surface soil samples, installing three monitoring wells, and collecting seven groundwater samples. The samples were analyzed for TCL VOCs, SVOCs, pesticides, PCBs, and TAL inorganic analytes.

5.1 GEOLOGIC ASSESSMENT. Surface soils were generally described as yellow to orange (fine- to very fine-grained) clayey sand or light tan (fine- to very fine-grained) silty sand. The shallow subsurface soil (2 to 7 feet bls) tended to be brown to red in color and contained interbedded sand, silt, and clay layers (ABB-ES, 1995c).

The lithology of subsurface soil consists predominantly of yellow, red, and brown silt and sands (fine- to medium-grained) overlying well graded sands. Stringers of clay and poorly graded sands were common throughout the area. A clay layer of significant thickness (greater than 4 feet) and areal extent appears to exist within the Southeast Disposal Areas. The layer is 15 to 25 feet thick and is located between 75 and 50 feet above National Geodetic Vertical Datum of 1929 (NGVD). The clay layer was not identified in the soil boring for monitoring well WHF-13-1S, indicating the layer may be discontinuous at Site 13 (ABB-ES, 1995c). Detailed descriptions can be found in the boring and monitoring well logs presented in the RI Phase IIA Technical Memorandum No. 2 (ABB-ES, 1995c). A general discussion of the geology at NAS Whiting Field is presented in Subsection 1.4.5 of the GIR (HLA, 1998). Site 13 monitoring well boring logs are presented in Appendix B of this report.

5.2 HYDROGEOLOGIC ASSESSMENT. The hydrogeologic assessment included determining horizontal and vertical hydraulic gradients, hydraulic conductivities, and seepage velocities. The hydrogeologic assessment results were used to characterize the transport of CPCs from the site by groundwater flow. Contaminant fate and transport mechanisms for human health and ecological chemicals of potential concern (ECPC) at Site 13 are presented in Chapter 8.0 of this report.

Groundwater Flow Direction. Table 5-1 summarizes the results of the water-level measurements for the RI/FS sites in the Southeastern Disposal Areas, including Site 13, during the RI field program. Interpretation of the potentiometric surface maps indicates a groundwater flow direction to the south-southeast. Groundwater flow patterns for the measurement events on January 16 to 18, 1997 (Figure 5-1) and August 7 to 9, 1997, (Figure 5-2) are similar, suggesting similar groundwater flow patterns during different seasons at Site 13. Vertical head variations over time at any individual well generally fluctuate less than one foot, with maximum vertical fluctuations up to 5 feet. Facilitywide water table elevation data are provided in Appendix D of the GIR (HLA, 1998).

Table 5-1
Summary of Water-Level Elevations, Southeast Disposal Area Sites

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Monitoring Well Designation	Well TOC Elevation (msl)	Well Depth (feet BTOC)	September 30 and October 1, 1993		February 8 and 9, 1994		June 22 to 24, 1994	
			Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)
Southeast Disposal Area								
Site 9, Waste Fuel Disposal Pit								
WHF-9-1	146.55	118.40	86.72	59.83	89.34	57.21	88.19	58.36
WHF-9-2	161.07	124.35	100.03	61.04	102.69	58.38	101.95	59.12
WHF-9-3S	150.85	108.24	90.78	60.07	93.35	57.50	92.28	58.57
Site 10, Southeast Open Disposal Area (A)								
WHF-10-1	146.73	118.20	88.12	58.61	90.62	56.11	89.60	57.13
WHF-10-2	150.75	113.14	92.04	58.71	94.58	56.17	93.62	57.13
Site 11, Southeast Open Disposal Area (B)								
WHF-11-1	124.71	128.40	51.08	73.62	63.42	61.29	62.23	62.48
WHF-11-1S	116.65	54.40	45.50	71.15	45.99	70.66	44.63	72.02
WHF-11-2	148.12	125.84	93.50	54.62	95.93	52.19	94.97	53.15
WHF-11-3	117.19	73.16	61.91	55.28	64.22	52.97	63.08	54.11
WHF-11-4S	129.43	76.00	--	--	--	--	--	--
WHF-11-4I	129.28	106.00	--	--	--	--	--	--
Site 12, Tetraethyl Lead Disposal Area								
WHF-12-1	136.40	113.40	80.20	56.20	82.68	53.72	81.67	54.73
WHF-12-2	135.56	85.00	--	--	--	--	--	--
Site 13, Sanitary Landfill								
WHF-13-1	102.66	122.90	50.62	52.04	52.90	49.76	51.89	50.77
WHF-13-1S	108.97	61.30	55.25	53.72	57.59	51.38	56.45	52.52
WHF-13-1I	109.17	91.00	--	--	--	--	--	--
WHF-13-2S	102.86	72.41	51.61	51.25	53.85	49.01	52.93	49.93

See notes at end of table.

Table 5-1 (Continued)
Summary of Water-Level Elevations, Southeast Disposal Area Sites

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Monitoring Well Designation	Well TOC Elevation (msl)	Well Depth (feet BTOC)	September 30 and October 1, 1993		February 8 and 9, 1994		June 22 to 24, 1994	
			Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)
Site 13, Sanitary Landfill--continued								
WHF-13-3S	81.44	42.00	--	--	--	--	--	--
WHF-13-4S	80.37	42.00	--	--	--	--	--	--
Site 14, Short-Term Sanitary Landfill								
WHF-14-1	139.69	153.20	88.49	51.20	90.79	48.90	90.12	49.57
WHF-14-2	145.80	118.30	95.15	50.65	97.45	48.35	96.86	48.94

See notes at end of table.

Table 5-1 (Continued)
Summary of Water-Level Elevations, Southeast Disposal Area Sites

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Monitoring Well Designation	Well TOC Elevation (msl)	Well Depth (feet BTOC)	October 10 to October 13, 1994		January 10 to 13, 1995		April 19 and 20, 1995	
			Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)
Southeast Disposal Area								
Site 9, Waste Fuel Disposal Pit								
WHF-9-1	146.55	118.40	82.20	64.35	82.82	63.73	82.73	63.82
WHF-9-2	161.07	124.35	95.49	65.58	95.99	65.08	96.14	64.93
WHF-9-3S	150.85	108.24	86.16	64.69	86.73	64.12	86.80	64.05
Site 10, Southeast Open Disposal Area (A)								
WHF-10-1	146.73	118.20	83.45	63.28	83.97	62.76	84.12	62.61
WHF-10-2	150.75	113.14	NC	NC	88.00	62.75	88.10	62.65
Site 11, Southeast Open Disposal Area (B)								
WHF-11-1	124.71	128.40	56.37	68.34	57.17	67.54	56.92	67.79
WHF-11-1S	116.65	54.40	43.56	73.09	44.57	72.08	44.03	72.62
WHF-11-2	148.12	125.84	88.79	59.33	89.22	58.90	89.56	58.56
WHF-11-3	117.19	73.16	57.16	60.03	57.97	59.22	57.74	59.45
WHF-11-4S	129.43	76.00	--	--	--	--	--	--
WHF-11-4I	129.28	106.00	--	--	--	--	--	--
Site 12, Tetraethyl Lead Disposal Area								
WHF-12-1	136.40	113.40	75.41	60.99	76.06	60.34	76.22	60.18
WHF-12-2	135.56	85.00	--	--	--	--	--	--
Site 13, Sanitary Landfill								
WHF-13-1	102.66	122.90	46.00	56.66	46.73	55.93	46.61	56.05
WHF-13-1S	108.97	61.30	50.29	58.68	51.18	57.79	51.02	57.95
WHF-13-1I	109.17	91.00	--	--	--	--	--	--
WHF-13-2S	102.86	72.41	47.00	55.86	47.66	55.20	47.64	55.22

See notes at end of table.

Table 5-1 (Continued)
Summary of Water-Level Elevations, Southeast Disposal Area Sites

Remedial Investigation Report
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Monitoring Well Designation	Well TOC Elevation (msl)	Well Depth (feet BTOC)	October 10 to October 13, 1994		January 10 to 13, 1995		April 19 and 20, 1995	
			Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)
Site 13, Sanitary Landfill--continued								
WHF-13-3S	81.44	42.00	--	--	--	--	--	--
WHF-13-4S	80.37	42.00	--	--	--	--	--	--
Site 14, Short-Term Sanitary Landfill								
WHF-14-1	139.69	153.20	83.88	55.81	84.30	55.39	84.67	55.02
WHF-14-2	145.80	118.30	90.56	55.24	90.93	54.87	91.41	54.39

See notes at end of table.

Table 5-1 (Continued)
Summary of Water-Level Elevations, Southeast Disposal Area Sites

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Monitoring Well Designation	Well TOC Elevation (msl)	Well Depth (feet BTOC)	July 28 and 29, 1995		October 12 to 14, 1995		January 19 and 20, 1996	
			Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)
Southeast Disposal Area								
Site 9, Waste Fuel Disposal Pit								
WHF-9-1	146.55	118.40	82.01	64.54	82.27	64.28	76.91	69.64
WHF-9-2	161.07	124.35	95.15	65.92	95.35	65.72	90.03	71.04
WHF-9-3S	150.85	108.24	85.90	64.95	86.14	64.71	80.78	70.07
Site 10, Southeast Open Disposal Area (A)								
WHF-10-1	146.73	118.20	83.22	63.51	83.62	63.11	78.33	68.40
WHF-10-2	150.75	113.14	87.15	63.60	87.55	63.20	82.25	68.50
Site 11, Southeast Open Disposal Area (B)								
WHF-11-1	124.71	128.40	56.49	68.22	56.96	67.75	51.85	72.86
WHF-11-1S	116.65	54.40	44.18	72.47	44.18	72.47	43.26	73.39
WHF-11-2	148.12	125.84	88.73	59.39	89.45	58.67	84.03	64.09
WHF-11-3	117.19	73.16	57.13	60.06	57.81	59.38	52.69	64.50
WHF-11-4S	129.43	76.00	--	--	--	--	--	--
WHF-11-4I	129.28	106.00	--	--	--	--	--	--
Site 12, Tetraethyl Lead Disposal Area								
WHF-12-1	136.40	113.40	75.38	61.02	75.99	60.41	70.61	65.79
WHF-12-2	135.56	85.00	--	--	--	--	--	--
Site 13, Sanitary Landfill								
WHF-13-1	102.66	122.90	46.19	56.47	46.93	55.73	41.87	60.79
WHF-13-1S	108.97	61.30	50.62	58.35	51.34	57.63	45.92	63.05
WHF-13-1I	109.17	91.00	--	--	--	--	--	--
WHF-13-2S	102.86	72.41	46.09	56.77	47.98	54.88	42.91	59.95

See notes at end of table.

Table 5-1 (Continued)
Summary of Water-Level Elevations, Southeast Disposal Area Sites

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Monitoring Well Designation	Well TOC Elevation (msl)	Well Depth (feet BTOC)	July 28 and 29, 1995		October 12 to 14, 1995		January 19 and 20, 1996	
			Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)
Site 13, Sanitary Landfill--continued								
WHF-13-3S	81.44	42.00	--	--	--	--	--	--
WHF-13-4S	80.37	42.00	--	--	--	--	--	--
Site 14, Short-Term Sanitary Landfill								
WHF-14-1	139.69	153.20	83.90	55.79	84.84	54.85	79.60	60.09
WHF-14-2	145.80	118.30	90.55	55.25	91.55	54.26	86.30	59.50

See notes at end of table.

Table 5-1 (Continued)
Summary of Water-Level Elevations, Southeast Disposal Area Sites

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Monitoring Well Designation	Well TOC Elevation (msl)	Well Depth (feet BTOC)	April 25 to 27, 1996		July 25 to 27, 1996		November 7 and 9, 1996	
			Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)
Southeast Disposal Area								
Site 9, Waste Fuel Disposal Pit								
WHF-9-1	146.55	118.40	75.99	70.56	77.44	69.11	80.85	65.70
WHF-9-2	161.07	124.35	89.13	71.94	90.27	70.80	93.61	67.46
WHF-9-3S	150.85	108.24	79.96	70.89	81.30	69.55	84.67	66.18
Site 10, Southeast Open Disposal Area (A)								
WHF-10-1	146.73	118.20	77.49	69.24	78.82	67.91	82.18	64.55
WHF-10-2	150.75	113.14	81.44	69.31	82.66	68.09	86.02	64.73
Site 11, Southeast Open Disposal Area (B)								
WHF-11-1	124.71	128.40	50.82	73.89	52.98	71.73	56.17	68.54
WHF-11-1S	116.65	54.40	43.35	73.30	44.43	72.22	45.25	71.40
WHF-11-2	148.12	125.84	83.53	64.59	84.58	63.54	88.01	60.11
WHF-11-3	117.19	73.16	51.68	65.51	53.78	63.41	57.03	60.16
WHF-11-4S	129.43	76.00	--	--	--	--	67.81	61.62
WHF-11-4I	129.28	106.00	--	--	64.20	65.08	68.04	61.24
Site 12, Tetraethyl Lead Disposal Area								
WHF-12-1	136.40	113.40	69.90	66.50	71.37	65.03	74.75	61.65
WHF-12-2	135.56	85.00	--	--	--	--	--	--
Site 13, Sanitary Landfill								
WHF-13-1	102.66	122.90	41.14	61.52	42.84	59.82	46.17	56.49
WHF-13-1S	108.97	61.30	45.18	63.79	47.11	61.86	50.48	58.49
WHF-13-1I	109.17	91.00	--	--	--	--	51.45	57.72
WHF-13-2S	102.86	72.41	42.26	60.60	43.88	58.98	47.13	55.73

See notes at end of table.

Table 5-1 (Continued)
Summary of Water-Level Elevations, Southeast Disposal Area Sites

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Monitoring Well Designation	Well TOC Elevation (msl)	Well Depth (feet BTOC)	April 25 to 27, 1996		July 25 to 27, 1996		November 7 and 9, 1996	
			Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)
Site 13, Sanitary Landfill--continued								
WHF-13-3S	81.44	42.00	--	--	--	--	--	--
WHF-13-4S	80.37	42.00	--	--	--	--	--	--
Site 14, Short-Term Sanitary Landfill								
WHF-14-1	139.69	153.20	79.14	60.55	80.19	59.50	NC	NC
WHF-14-2	145.80	118.30	85.90	59.90	86.83	58.97	90.33	55.47

See notes at end of table.

Table 5-1 (Continued)
Summary of Water-Level Elevations, Southeast Disposal Area Sites

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Monitoring Well Designation	Well TOC Elevation (msl)	Well Depth (feet BTOC)	January 16 to 18, 1997		August 7 to 9, 1997	
			Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)
Southeast Disposal Area						
Site 9, Waste Fuel Disposal Pit						
WHF-9-1	146.55	118.40	83.07	63.48	84.69	61.86
WHF-9-2	161.07	124.35	96.01	65.06	97.88	63.19
WHF-9-3S	150.85	108.24	87.01	63.84	88.69	62.16
Site 10, Southeast Open Disposal Area (A)						
WHF-10-1	146.73	118.20	84.50	62.23	86.16	60.57
WHF-10-2	150.75	113.14	88.38	62.37	90.08	60.67
Site 11, Southeast Open Disposal Area (B)						
WHF-11-1	124.71	128.40	58.24	66.47	59.28	65.43
WHF-11-1S	116.65	54.40	45.71	70.94	44.83	71.82
WHF-11-2	148.12	125.84	90.29	57.83	92.20	55.92
WHF-11-3	117.19	73.16	59.10	58.09	60.13	57.06
WHF-11-4S	129.43	76.00	70.07	59.36	71.19	58.24
WHF-11-4I	129.28	106.00	69.72	59.56	71.16	58.12
Site 12, Tetraethyl Lead Disposal Area						
WHF-12-1	136.40	113.40	77.02	59.38	78.42	57.98
WHF-12-2	135.56	85.00	76.11	59.45	79.54	56.02
Site 13, Sanitary Landfill						
WHF-13-1	102.66	122.90	48.38	54.28	49.41	53.25
WHF-13-1S	108.97	61.30	52.27	56.70	53.55	55.42
WHF-13-1I	109.17	91.00	52.20	56.97	53.63	55.54
WHF-13-2S	102.86	72.41	49.10	53.76	50.14	52.72
WHF-13-3S	81.44	42.00	--	--	28.26	53.18
WHF-13-4S	80.37	42.00	--	--	31.35	49.02

See notes at end of table.

Table 5-1 (Continued)
Summary of Water-Level Elevations, Southeast Disposal Area Sites

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Monitoring Well Designation	Well TOC Elevation (msl)	Well Depth (feet BTOC)	January 16 to 18, 1997		August 7 to 9, 1997	
			Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet above msl)
Site 14, Short-Term Sanitary Landfill						
WHF-14-1	139.69	153.20	85.85	53.84	87.11	52.58
WHF-14-2	145.80	118.30	92.55	53.25	93.83	52.17

Notes: TOC = top of casing.
msl = mean sea level.
BTOC = below top of casing.
-- = not calculated.

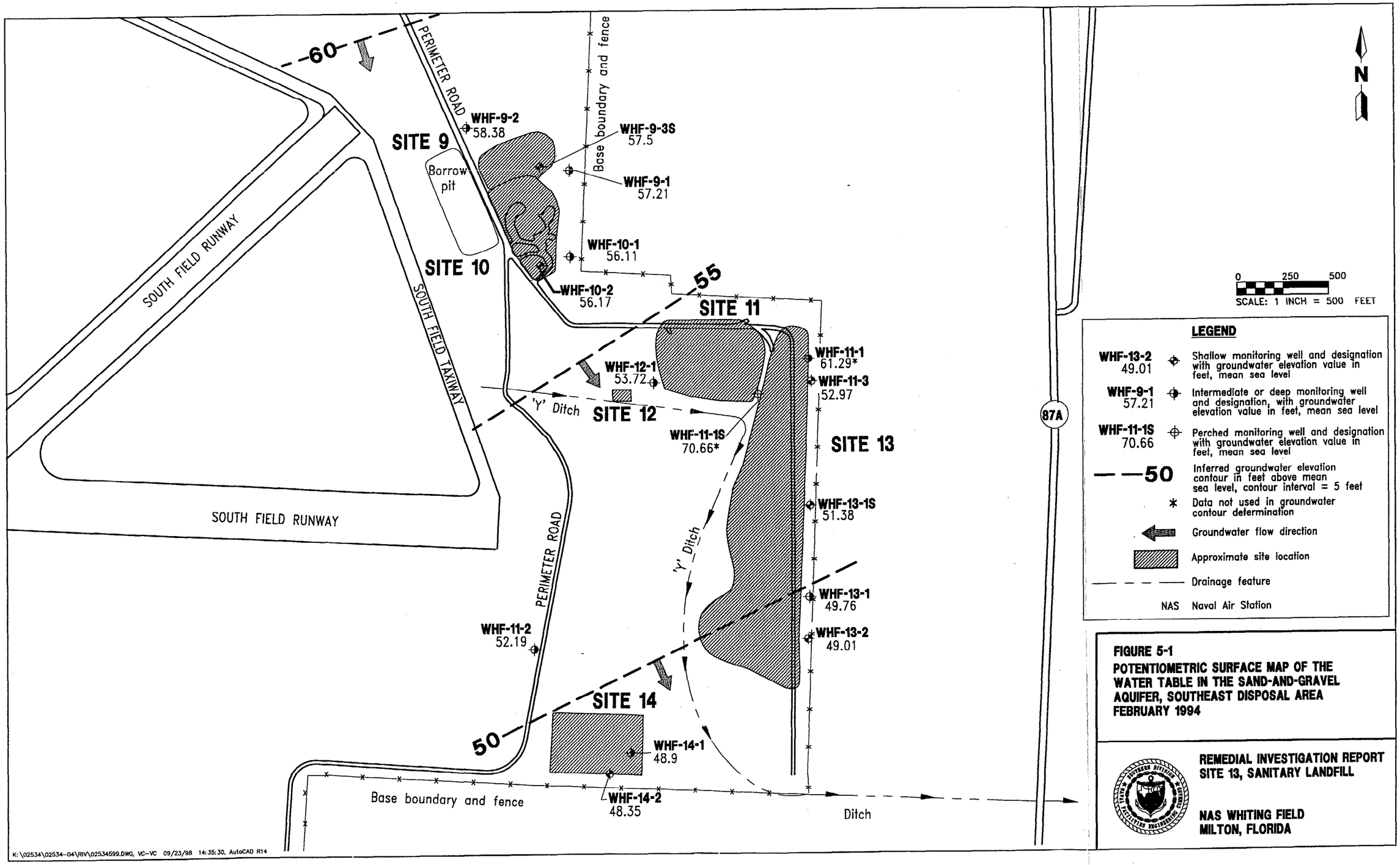


FIGURE 5-1
POTENTIOMETRIC SURFACE MAP OF THE WATER TABLE IN THE SAND-AND-GRAVEL AQUIFER, SOUTHEAST DISPOSAL AREA
FEBRUARY 1994

REMEDIAL INVESTIGATION REPORT
SITE 13, SANITARY LANDFILL

NAS WHITING FIELD
MILTON, FLORIDA

00245DB42

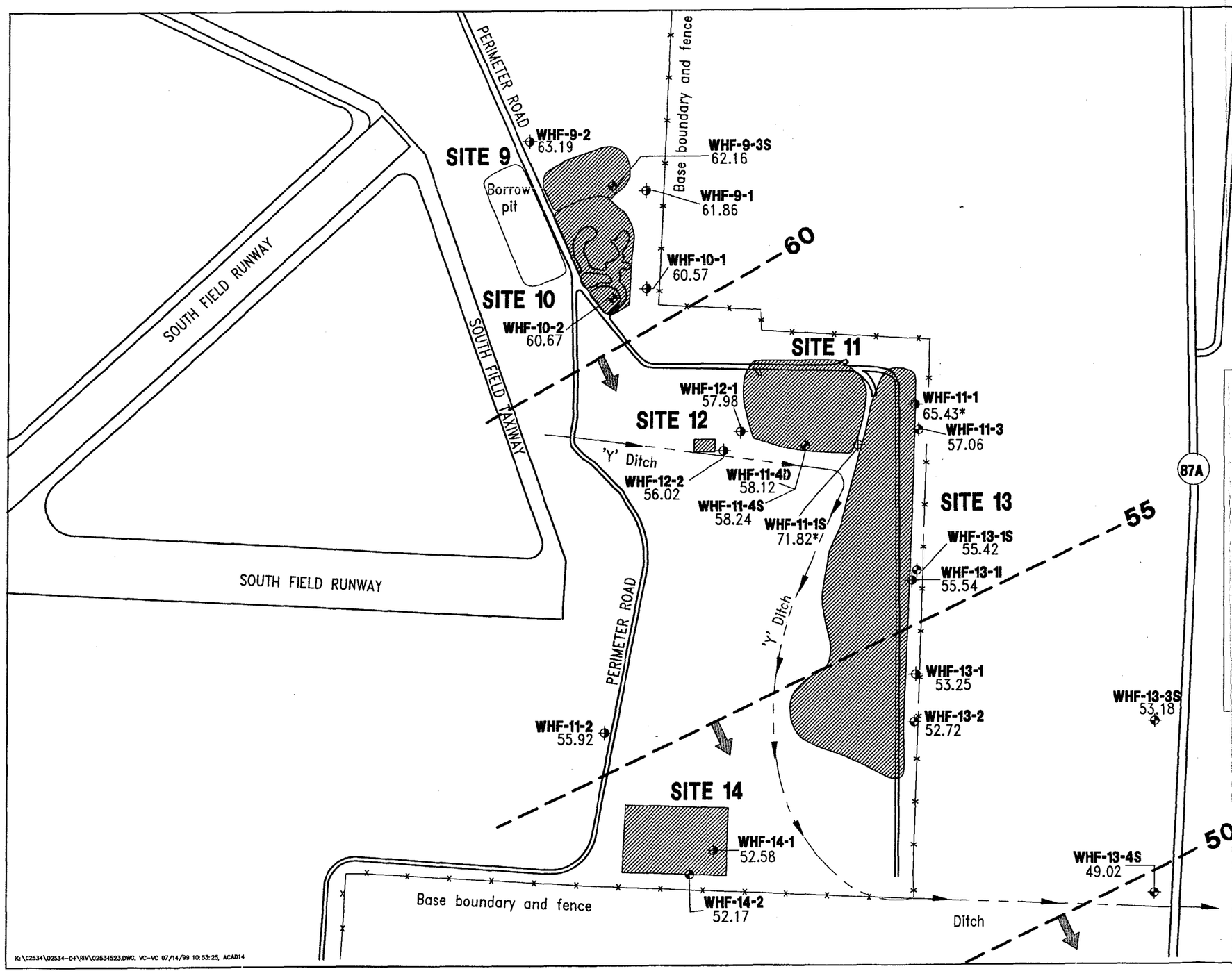


FIGURE 5-2
POTENTIOMETRIC SURFACE MAP OF THE WATER TABLE IN THE SAND-AND-GRAVEL AQUIFER, SOUTHEAST DISPOSAL AREA AUGUST 1997

REMEDIAL INVESTIGATION REPORT
SITE 13, SANITARY LANDFILL

NAS WHITING FIELD
MILTON, FLORIDA

Horizontal Hydraulic Gradients. Table 5-2 provides a summary of the horizontal hydraulic gradients calculated for the Southeastern Disposal Areas. The horizontal hydraulic gradients in the area ranged from 0.0036 feet per foot (ft/ft) to 0.0021 ft/ft. The average horizontal hydraulic gradient for each measurement event ranged from 0.0027 ft/ft for February 1994, January 1995, and July 1995 to 0.0033 ft/ft for April 1996. The overall average horizontal hydraulic gradient for all measurement events from 1993 through 1997 was 0.0029 ft/ft.

Vertical Hydraulic Gradients. Table 5-3 presents a summary of the vertical hydraulic gradients calculated for the Southeast Disposal Areas. The vertical hydraulic gradients were calculated using a well pair at Site 14 (monitoring wells WHF-14-1 and WHF-14-2) through Phase IIA and IIB. With the installation of two additional well clusters during Phase IIB at Site 11 (WHF-11-4S and WHF-11-4D) and Site 13 (WHF-13-1S and WHF-13-1I), vertical hydraulic gradients were also calculated at these sites with data collected since November 1996. Values calculated for the paired monitoring wells ranged from 0.502 ft/ft to 0.004 ft/ft. Vertical hydraulic gradients were in an upward direction during most measurement events; however, downward gradients were observed at Site 11 during the November 1996 and August 1997 surveys, and at Site 13 during the November 1996 survey.

Hydraulic Conductivity and Seepage Velocity. Five slug tests were conducted in the Southeast Disposal Areas during the RI. Table 5-4 summarizes the hydraulic conductivity values calculated for the monitoring wells in the Southeast Disposal Areas.

Hydraulic conductivity data from monitoring well WHF-10-2 exceeded the 20 percent variance criteria in the data evaluation procedure and thus were rejected. In addition, all hydraulic conductivity data from well WHF-11-2 were rejected because the data were unpredictable. The complete evaluation of hydraulic conductivity data is presented in Section 2.3 (Table 2-2) of Technical Memorandum No. 4, Hydrogeologic Assessment (ABB-ES, 1995d).

Average hydraulic conductivity values for individual monitoring wells ranged from 4.73 feet per day (ft/day) (1.67×10^{-3} centimeters per second [cm/sec]) for monitoring well WHF-11-3 to 14.55 ft/day (5.13×10^{-3} cm/sec) for monitoring well WHF-13-2S. The geometric mean of the hydraulic conductivity data from the monitoring wells in the Southeast Disposal Areas was 8.38 ft/day (2.96×10^{-3} cm/sec). The five monitoring wells selected from the Southeast Disposal Area were shallow wells screened within well graded to poorly graded sand between 27 and 59 feet above NGVD.

Seepage Velocity. Table 5-5 summarizes the average linear pore water velocity (seepage velocities) for the water table zone of the sand and gravel aquifer for sites in the Southeast Disposal Areas. The calculations used an assumed effective porosity of 0.35 for the site. The value represents silty through poorly graded sands (Fetter, 1988). Seepage velocities ranged from 0.069 ft/day at Sites 9, 10, 11, 13, and 14 to 0.080 ft/day at Sites 11 and 13. The average of the seepage velocity values for the Southeast Disposal Area sites was 0.074 ft/day (27 feet per year [ft/yr]).

Table 5-2
Summary of Horizontal Hydraulic Gradients
Southeast Disposal Area Sites

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Well Designation	Distance Between Wells (feet)	September 30 to October 1, 1993		February 8 and 9, 1994		June 22 to 24, 1994		October 10 to 13, 1994	
		Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)
Southeast Disposal Area									
WHF-9-3S	526	60.07	0.0026	57.50	0.0025	58.57	0.0027	64.69	NC
WHF-10-2		58.71		56.17		57.13		NC	
WHF-9-1	460	59.83	0.0027	57.21	0.0024	58.36	0.0027	64.35	0.0023
WHF-10-1		58.61		56.11		57.13		63.28	
WHF-9-2	842	61.04	0.0028	58.38	0.0026	59.12	0.0024	65.58	NC
WHF-10-2		58.71		56.17		57.13		NC	
WHF-11-3	1,381	55.28	0.0029	52.97	0.0029	54.11	0.0030	60.03	0.0030
WHF-13-2S		51.25		49.01		49.93		55.86	
WHF-11-2	1,123	54.62	0.0030	52.19	0.0029	53.15	0.0032	59.33	0.0031
WHF-14-1		51.20		48.90		49.57		55.81	
WHF-9-2	3,547	61.04	0.0029	58.38	0.0028	59.12	0.0029	65.58	0.0029
WHF-14-2		50.65		48.35		48.94		55.24	
	Average gradient		0.0028		0.0027		0.0028		0.0028

See notes at end of table.

Table 5-2 (Continued)
Summary of Horizontal Hydraulic Gradients
Southeast Disposal Area Sites

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Well Designation	Distance Between Wells (feet)	January 10 to 31, 1995		April 19 and 20, 1995		July 28 and 29, 1995		October 12 to 14, 1995	
		Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)
Southeast Disposal Area									
WHF-9-3S	526	64.12	0.0026	64.05	0.0027	64.95	0.0026	64.71	0.0029
WHF-10-2		62.75		62.65		63.60		63.20	
WHF-9-1	460	63.73	0.0021	63.82	0.0026	64.54	0.0022	64.28	0.0025
WHF-10-1		62.76		62.61		63.51		63.11	
WHF-9-2	842	65.08	0.0028	64.93	0.0027	65.92	0.0028	65.72	0.0030
WHF-10-2		62.75		62.65		63.60		63.20	
WHF-11-3	1,381	59.22	0.0029	59.45	0.0031	60.06	0.0024	59.38	0.0033
WHF-13-2S		55.20		55.22		56.77		54.88	
WHF-11-2	1,123	58.90	0.0031	58.56	0.0032	59.39	0.0032	58.67	0.0034
WHF-14-1		55.39		55.02		55.79		54.85	
WHF-9-2	3,547	65.08	0.0029	64.93	0.0030	65.92	0.0030	65.72	0.0032
WHF-14-2		54.87		54.39		55.25		54.26	
	Average gradient		0.0027		0.0029		0.0027		0.0030

See notes at end of table.

Table 5-2 (Continued)
Summary of Horizontal Hydraulic Gradients
Southeast Disposal Area Sites

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Well Designation	Distance Between Wells (feet)	January 19 and 20, 1996		April 25 to 27, 1996		July 25 to 27, 1996		November 7 to 9, 1996	
		Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)
Southeast Disposal Area									
WHF-9-3S	526	70.07	0.0030	70.89	0.0030	69.55	0.0028	66.18	0.0028
WHF-10-2		68.50		69.31		68.09		64.73	
WHF-9-1	460	69.64	0.0027	70.56	0.0029	69.11	0.0026	65.70	0.0025
WHF-10-1		68.40		69.24		67.91		64.55	
WHF-9-2	842	71.04	0.0030	71.94	0.0031	70.80	0.0032	67.46	0.0032
WHF-10-2		68.50		69.31		68.09		64.73	
WHF-11-3	1,381	64.50	0.0033	65.51	0.0036	63.41	0.0032	60.16	0.0032
WHF-13-2S		59.95		60.60		58.98		55.73	
WHF-11-2	1,123	64.09	0.0036	64.59	0.0036	63.54	0.0036	60.11	NC
WHF-14-1		60.09		60.55		59.50		NC	
WHF-9-2	3,547	71.04	0.0033	71.94	0.0034	70.80	0.0033	67.46	0.0033
WHF-14-2		59.50		59.90		58.97		55.47	
	Average gradient		0.0032		0.0033		0.0031		0.0030

See notes at end of table.

Table 5-2 (Continued)
Summary of Horizontal Hydraulic Gradients
Southeast Disposal Area Sites

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Well Designation	Distance Between Wells (feet)	January 16 to 18, 1997		August 7 to 9, 1997	
		Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)
Southeast Disposal Area					
WHF-9-3S	526	63.84	0.0028	62.16	0.0028
WHF-10-2		62.37		60.67	
WHF-9-1	460	63.48	0.0027	61.86	0.0028
WHF-10-1		62.23		60.57	
WHF-9-2	842	65.06	0.0032	63.19	0.0030
WHF-10-2		62.37		60.67	
WHF-11-3	1,381	58.04	0.0031	57.06	0.0031
WHF-13-2S		53.76		52.72	
WHF-11-2	1,123	57.83	0.0036	55.92	0.0036
WHF-14-1		53.84		52.58	
WHF-9-2	3,547	65.06	0.0033	63.19	0.0031
WHF-14-2		53.25		52.17	
	Average gradient		0.0031		0.0031

Notes: msl = mean sea level
ft/ft = feet per foot
NC = not calculated

Table 5-3
Summary of Vertical Hydraulic Gradients
Southeast Disposal Area Sites

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

			September 30 and October 1, 1993			February 8 and 9, 1994		
Well Number	Bottom of Well Elevation (msl)	Vertical Distance Between Screens (feet)	Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction	Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction
Southeast Disposal Area								
WHF-14-2	27.5	41.01	50.65	0.0134	Upward	48.35	0.0134	Upward
WHF-14-1	-13.51	--	51.20	--	--	48.90	--	--
WHF-13-1S	47.67	29.50	53.72	--	--	51.38	--	--
WHF-13-1I	18.17	--	--	--	--	--	--	--
WHF-11-4S	53.43	30.15	--	--	--	--	--	--
WHF-11-4D	23.28	--	--	--	--	--	--	--

			June 22 to 24, 1994			October 10 to 13, 1994		
Southeast Disposal Area								
WHF-14-2	27.5	41.01	48.94	0.0154	Upward	55.24	0.0139	Upward
WHF-14-1	-13.51	--	49.57	--	--	55.81	--	--
WHF-13-1S	47.67	29.50	52.52	--	--	56.66	--	--
WHF-13-1I	18.17	--	--	--	--	--	--	--
WHF-11-4S	53.43	30.15	--	--	--	--	--	--
WHF-11-4D	23.28	--	--	--	--	--	--	--

See notes at end of table.

Table 5-3 (Continued)
Summary of Vertical Hydraulic Gradients
Southeast Disposal Area Sites

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

			January 10 to 13, 1995			April 19 and 20, 1995		
Well Number	Bottom of Well Elevation (msl)	Vertical Distance Between Screens (feet)	Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction	Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction
Southeast Disposal Area								
WHF-14-2	27.5	41.01	54.87	0.0127	Upward	54.39	0.0154	Upward
WHF-14-1	-13.51	--	55.39	--	--	55.02	--	--
WHF-13-1S	47.67	29.50	57.79	--	--	57.95	--	--
WHF-13-1I	18.17	--	--	--	--	--	--	--
WHF-11-4S	53.43	30.15	--	--	--	--	--	--
WHF-11-4D	23.28	--	--	--	--	--	--	--

			July 28 and 29, 1995			October 12 to 14, 1995		
Well Number	Bottom of Well Elevation (msl)	Vertical Distance Between Screens (feet)	Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction	Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction
Southeast Disposal Area								
WHF-14-2	27.5	41.01	55.25	0.0132	Upward	54.26	0.0144	Upward
WHF-14-1	-13.51	--	55.79	--	--	54.85	--	--
WHF-13-1S	47.67	29.50	58.35	--	--	57.63	--	--
WHF-13-1I	18.17	--	--	--	--	--	--	--
WHF-11-4S	53.43	30.15	--	--	--	--	--	--
WHF-11-4D	23.28	--	--	--	--	--	--	--

See notes at end of table.

Table 5-3 (Continued)
Summary of Vertical Hydraulic Gradients
Southeast Disposal Area Sites

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

			January 19 to 20, 1996			April 25 and 27, 1996		
Well Number	Bottom of Well Elevation (msl)	Vertical Distance Between Screens (feet)	Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction	Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction
Southeast Disposal Area								
WHF-14-2	27.5	41.01	59.50	0.0144	Upward	59.90	0.0158	Upward
WHF-14-1	-13.51	--	60.09	--	--	60.55	--	--
WHF-13-1S	47.67	29.50	63.05	--	--	63.79	--	--
WHF-13-1I	18.17	--	--	--	--	--	--	--
WHF-11-4S	53.43	30.15	--	--	--	--	--	--
WHF-11-4D	23.28	--	--	--	--	--	--	--

			July 25 to 27, 1996			November 7 and 9, 1996		
Well Number	Bottom of Well Elevation (msl)	Vertical Distance Between Screens (feet)	Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction	Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction
Southeast Disposal Area								
WHF-14-2	27.5	41.01	58.97	0.0129	Upward	55.47	0.502	Upward
WHF-14-1	-13.51	--	59.50	--	--	76.04	--	--
WHF-13-1S	47.67	29.50	--	--	--	58.49	0.026	Downward
WHF-13-1I	18.17	--	--	--	--	57.72	--	--
WHF-11-4S	53.43	30.15	--	--	--	61.62	0.013	Downward
WHF-11-4D	23.28	--	--	--	--	61.24	--	--

See notes at end of table.

Table 5-3 (Continued)
Summary of Vertical Hydraulic Gradients
Southeast Disposal Area Sites

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Well Number	Bottom of Well Elevation (msl)	Vertical Distance Between Screens (feet)	January 16 to 18, 1997			August 7 to 9, 1997		
			Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction	Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction
Southeast Disposal Area								
WHF-14-2	27.5	41.01	53.25	0.0144	Upward	52.17	0.010	Upward
WHF-14-1	-13.51	--	53.84	--	--	52.58		
WHF-13-1S	47.67	29.50	56.70	0.0092	Upward	55.42	0.0041	Upward
WHF-13-1I	18.17	--	56.97	--	--	55.54		
WHF-11-4S	53.43	30.15	59.36	0.0066	Upward	58.24	0.0040	Downward
WHF-11-4D	23.28	--	59.56	--	--	58.12		

Note: msl = mean sea level.
ft/ft = feet per foot.
-- = not available.

Table 5-4
Summary of Hydraulic Conductivity (K) Data from Slug Tests
Southeast Disposal Area Sites

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Well Number	Range of K (ft/day)	Number of Usable Runs	Average K (ft/min)	Average K (ft/day)	Average K (cm/sec)
Shallow and Intermediate Monitoring Wells					
Site 10, Southeast Open Disposal Area (A)					
WHF-10-2	R	R	R	R	R
Site 11, Southeast Open Disposal Area (B)					
WHF-11-2	R	R	R	R	R
WHF-11-3	4.41 to 5.23	3	0.0033	4.73	1.67×10^{-3}
Site 13, Sanitary Landfill					
WHF-13-2S	13.23 to 15.51	6	0.0101	14.55	5.13×10^{-3}
Site 14, Short-Term Sanitary Landfill					
WHF-14-2	8.53 to 8.57	2	0.0059	8.55	3.02×10^{-3}
			Geometric Mean	8.38	2.96×10^{-3}

Notes: Average is the arithmetic average.

ft/day = feet per day.
ft/min = feet per minute.
cm/sec = centimeters per second.
R = data rejected.

Table 5-5
Summary of Seepage Velocities
Southeast Disposal Area Sites

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Investigation Area	Sites	Monitoring Well Pair	Horizontal Gradient (ft/ft)[1]	K (ft/day)	Effective Porosity (n)	Seepage Velocity (ft/day)
Southeast Disposal Area	11 and 13	WHF-11-3 and WHF-13-2S	0.0029	[2]9.64	0.35	0.080
	9, 10, 11, 13, and 14	WHF-9-2 and WHF-14-2	0.0029	[3]8.38	0.35	0.069
					Arithmetic average	0.074

[1] Horizontal gradients are the average value for all groundwater measurements performed between September 30, 1993, and August 9, 1997.
[2] The K is averaged where values are available for both wells in the well pair.
[3] Geometric mean for the area.

Notes: ft/ft = feet per foot.
K = hydraulic conductivity.
ft/day = feet per day.

5.3 GEOPHYSICAL SURVEY. A multi-instrument geophysical survey was conducted at Site 13 in May and June 1992. Results of the magnetics, EM conductivity, and EM in-phase surveys all confirm the lateral extent of the landfill, as shown on Figures A-2 through A-4 in Appendix A. The landfill consists of three primary, north-south trending trenches occupying a combined area of approximately 1,750 feet by 250 feet. Total magnetic field anomalies ranged from 250 to 350 gammas (γ), EM-31 conductivity anomalies ranged from 8 to 18 millimhos/meter (mmhos/m), and EM-31 inphase anomalies ranged from 4 to 5 mmhos/m. These anomalies are interpreted to represent shallow buried metallic and ferromagnetic material debris located within the trenches.

Several additional isolated geophysical anomalies are identified in the southwest quadrant of Site 13, west of the main landfill boundaries (Figure 3-1). The isolated anomalies are interpreted to represent buried ferromagnetic materials (ABB-ES, 1995a).

5.4 SOIL GAS SURVEY. An active soil gas survey was conducted at 88 soil gas locations at Site 13 between July and September 1995 (Figure 3-1). The soil gas survey focused on the landfill areas, as interpreted from the geophysical data (see Figure 3-1). Table 5-6 presents the analytical results obtained from the soil gas survey including total VOCs (TVOCs) and methane (charcoal filtered reading). The results are presented spatially on Figures 5-3, 5-4, 5-5, and 5-6.

TVOCs were detected in samples from 50 locations within the major and minor disposal areas. TVOC concentrations ranged from one part per million (ppm) to greater than 5,000 ppm (note that the maximum monitoring instrument detection values were 5,000 ppm with the Portafid II flame ionization detector and 1,000 ppm with the OVA). Methane was detected at 33 of the locations with measurable TVOC concentrations. Methane concentrations ranged from one ppm to greater than 5,000 ppm. The proportion of methane in TVOC concentrations ranged from zero percent to 100 percent.

TVOCs and methane were also detected at two locations (55 and 61) where soil gas was monitored at depths of 4.5 feet and 6.0 feet bls. TVOC concentrations for these depth samples ranged from 90 ppm to greater than 5,000 ppm. Methane concentrations ranged from 50 ppm to 3,000 ppm.

Locations with measurable soil gas concentration were widespread at Site 13, occurring both in the major and minor geophysically defined anomaly areas, as well as in the areas between the identified features. Although TVOCs and methane in soil gas were detected over the largest area and with relatively higher total concentrations than other disposal areas evaluated at NAS Whiting Field, current conditions do not require remedial actions (such as gas control systems) under Florida Statute 62-701 regarding solid waste management facilities (ABB-ES, 1995b). Florida Statute 62-701 exempts landfills which were closed prior to 1985. Site 13, Sanitary Landfill was closed in 1984.

5.5 SURFACE SOIL ASSESSMENT. Table 5-7 summarizes the frequency of detection, range of detection limits, range of detection concentrations, mean of detected concentrations, and background screening values for the combined background samples of the Troup Loamy Sand and Lucy Loamy Sand types (i.e., the soil types present at Site 13). These data were used to screen potential contaminants of concern.

Table 5-6
Summary of Active Soil Gas Survey, July to September 1995

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Sample ID	Depth (feet)	Total VOC (ppm)	Methane (ppm)	Methane/VOC (percent)	Rinsate Blank (ppm)
7	1.5	0	0	NA	0
	3.0	0	0	NA	
8	1.5	0	0	NA	0
	3.0	0	0	NA	
9	1.5	0	0	NA	0
	3.0	0	0	NA	
10	1.5	0	0	NA	2
	3.0	6	0	NA	
11	1.5	0	0	NA	0
	3.0	0	0	NA	
13	1.5	0	0	NA	1
	3.0	0	0	NA	
14	1.5	19	12	63	0
	3.0	70	70	100	
15	1.5	0	0	NA	3
	3.0	0	0	NA	
16	1.5	0	0	NA	0
	3.0	0	0	NA	
17	1.5	1	1	100	1
	3.0	0	0	NA	
18	1.5	1	0	NA	1
	3.0	2	0	NA	
22	1.5	3	0	0	0
	3.0	0	0	NA	
23	1.5	0	0	NA	0
	3.0	0	0	NA	
24	1.5	0	0	NA	0
	3.0	2	2	73	
25	1.5	5	0	0	3
	3.0	6	0	0	

See notes at end of table.

Table 5-6 (Continued)
Summary of Active Soil Gas Survey, July to September 1995

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Sample ID	Depth (feet)	Total VOC (ppm)	Methane (ppm)	Methane/VOC (percent)	Rinsate Blank (ppm)
26	1.5	8	5	63	0
	3.0	5	0	0	
27	1.5	NA	NA	NA	2
	3.0	8	4	50	
28	1.5	7	4	57	0
	3.0	0	0	NA	
29	1.5	0	0	NA	2
	3.0	0	0	NA	
30	1.5	2	0	0	1
	3.0	0	0	NA	
[1]31	1.5	3	0	0	2
	3.0	0	0	NA	
[2]32	1.5	600	600	100	2
	3.0	>1,000	>1,000	NA	
33	1.5	0	0	NA	2
	3.0	>1,000	>1,000	NA	
34	1.5	0	0	NA	2
	3.0	17	14	82	
35	1.5	>1,000	>1,000	NA	2
	3.0	>5,000	>5,000	NA	
36	1.5	2	0	0	0
	3.0	0	0	NA	
37 (a)	1.5	0	0	NA	0
	3.0	NA	NA	NA	
37 (b)	1.5	NA	NA	NA	0
	3.0	>1,000	>1,000	NA	
38	1.5	0	0	NA	2
	3.0	700	700	100	
39	1.5	0	0	NA	0
	3.0	3,200	1,600	NA	

See notes at end of table.

Table 5-6 (Continued)
Summary of Active Soil Gas Survey, July to September 1995

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Sample ID	Depth (feet)	Total VOC (ppm)	Methane (ppm)	Methane/VOC (percent)	Rinsate Blank (ppm)
40	1.5	>5,000	>5,000	NA	0
	3.0	>5,000	>5,000	NA	
41	1.5	0	0	NA	0
	3.0	0	0	NA	
42	1.5	2	0	0	0
	3.0	>5,000	>5,000	NA	
43	1.5	0	0	NA	2
	3.0	0	0	NA	
44	1.5	>5,000	>5,000	NA	0
	3.0	>5,000	>5,000	NA	
45	1.5	3,000	2,650	88	0
	3.0	>5,000	>5,000	NA	
46	1.5	20	0	NA	0
	3.0	50	0	0	
47	1.5	0	0	NA	0
	3.0	0	0	NA	
48	1.5	0	0	NA	0
	3.0	--	--	--	
49	1.5	>5,000	>5,000	NA	0
	3.0	--	--	NA	
50	1.5	0	0	NA	0
	3.0	0	0	NA	
50D (Duplicate)	1.5	0	0	NA	2
	3.0	NA	NA	NA	
51	1.5	0	0	NA	1
	3.0	50	50	100	
52	1.5	0	0	NA	
	3.0	0	0	NA	0
53	1.5	0	0		
	3.0	1,000	1,000	100	2
54	1.5	0	0	NA	0
	3.0	>5,000	>5,000	NA	
54D (Duplicate)	1.5	1,500	1,500	100	0
	3.0	>5,000	>5,000	NA	

See notes at end of table.

Table 5-6 (Continued)
Summary of Active Soil Gas Survey, July to September 1995

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Sample ID	Depth (feet)	Total VOC (ppm)	Methane (ppm)	Methane/VOC (percent)	Rinsate Blank (ppm)
55	1.5	18	8	44	0
	3.0	3,800	3,800	100	
	4.5	90	50	NA	
	6.0	3,000	3,000	100	
55D (Duplicate)	1.5	>1,000	>1,000	NA	0
	3.0	160	160	100	
56	1.5	0	0	NA	0
	3.0	>5,000	>5,000	100	
57	1.5	0	0	NA	2
	3.0	9	6	67	
58	1.5	7	5	71	2
	3.0	>5,000	>5,000	NA	
59	1.5	0	0	NA	0
	3.0	165	160	97	
60	1.5	230	230	100	0
	3.0	>5,000	>5,000	NA	
61	1.5	0	0	NA	0
	3.0	>5,000	>5,000	NA	
	4.5	>5,000	--	NA	
	6.0	>5,000	--	NA	
62	1.5	0	0	NA	0
	3.0	0	0	NA	
63	1.5	2,000	2,000	100	0
	3.0	2,000	2,000	100	
64	1.5	45	19	42	0
	3.0	>5,000	>5,000	NA	
64D (Duplicate)	1.5	3,500	3,500	100	0
	3.0	>5,000	>5,000	NA	
65	1.5	1,300	1,300	100	0
	3.0	>5,000	>5,000	NA	

See notes at end of table.

Table 5-6 (Continued)
Summary of Active Soil Gas Survey, July to September 1995

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Sample ID	Depth (feet)	Total VOC (ppm)	Methane (ppm)	Methane/VOC (percent)	Rinsate Blank (ppm)
65D (Duplicate)	1.5	>1,000	>1,000	NA	0
	3.0	>1,000	>1,000	NA	
66	1.5	0	0	NA	0
	3.0	0	0	NA	
67	1.5	0	0	NA	0
	3.0	4	0	0	
68	1.5	0	0	NA	0
	3.0	>5,000	>5,000	NA	
69	1.5	--	--	--	0
	3.0	--	--	--	
69D (Duplicate)	1.5	>5,000	>5,000	NA	0
	3.0	4,500	4,500	100	
70	1.5	1	--	NA	0
	3.0	1	--	NA	
71	1.5	0	0	NA	0
	3.0	0	0	NA	
73	1.5	0	0	NA	0
	3.0	0	0	NA	
74	1.5	0	0	NA	0
	3.0	0	0	NA	
75	1.5	0	0	NA	0
	3.0	0	0	NA	
76	1.5	0	0	NA	0
	3.0	0	0	NA	
77	1.5	0	0	NA	0
	3.0	0	0	NA	
78	1.5	0	0	NA	0
	3.0	2	0	0	
79	1.5	0	0	NA	0
	3.0	0	0	NA	

See notes at end of table.

Table 5-6 (Continued)
Summary of Active Soil Gas Survey, July to September 1995

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Sample ID	Depth (feet)	Total VOC (ppm)	Methane (ppm)	Methane/VOC (percent)	Rinsate Blank (ppm)
80	1.5	0	0	NA	0
	3.0	0	0	NA	
81	1.5	0	0	NA	0
	3.0	0	0	NA	
82	1.5	0	0	NA	0
	3.0	0	0	NA	
83	1.5	0	0	NA	0
	3.0	0	0	NA	
84	1.5	0	0	NA	0
	3.0	0	0	NA	
85	1.5	0	0	NA	0
	3.0	0	0	NA	
86	1.5	0	0	NA	0
	3.0	0	0	NA	
87	1.5	0	0	NA	0
	3.0	0	0	NA	
88	1.5	0	0	NA	0
	3.0	0	0	NA	
89	1.5	0	0	NA	0
	3.0	0	0	NA	
90	1.5	0	0	NA	0
	3.0	0	0	NA	
91	1.5	0	0	NA	0
	3.0	0	0	NA	
92	1.5	0	0	NA	0
	3.0	0	0	NA	
93	1.5	0	0	NA	0
	3.0	0	0	NA	
94	1.5	0	0	NA	0
	3.0	3	0	NA	

See notes at end of table.

Table 5-6 (Continued)
Summary of Active Soil Gas Survey, July to September 1995

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Sample ID	Depth (feet)	Total VOC (ppm)	Methane (ppm)	Methane/VOC (percent)	Rinsate Blank (ppm)
95	1.5	1	0	0	1
	3.0	1	0	0	
96	1.5	2	0	0	2
	3.0	3	0	0	
97	1.5	2	0	0	3
	3.0	0	0	NA	
98	1.5	2	0	0	0
	3.0	0	0	NA	
99	1.5	0	0	NA	0
	3.0	1	0	0	

[1] Flame ionization detector (FID) unit failed at 3.0 foot sample interval.
[2] Both depth intervals resampled following FID failure.

Notes: Sample IDs 1 through 6 were not used during the investigation.

ID = identification.
VOC = volatile organic compounds.
ppm = parts per million.
NA = not applicable.
> = greater than.
-- = no result.

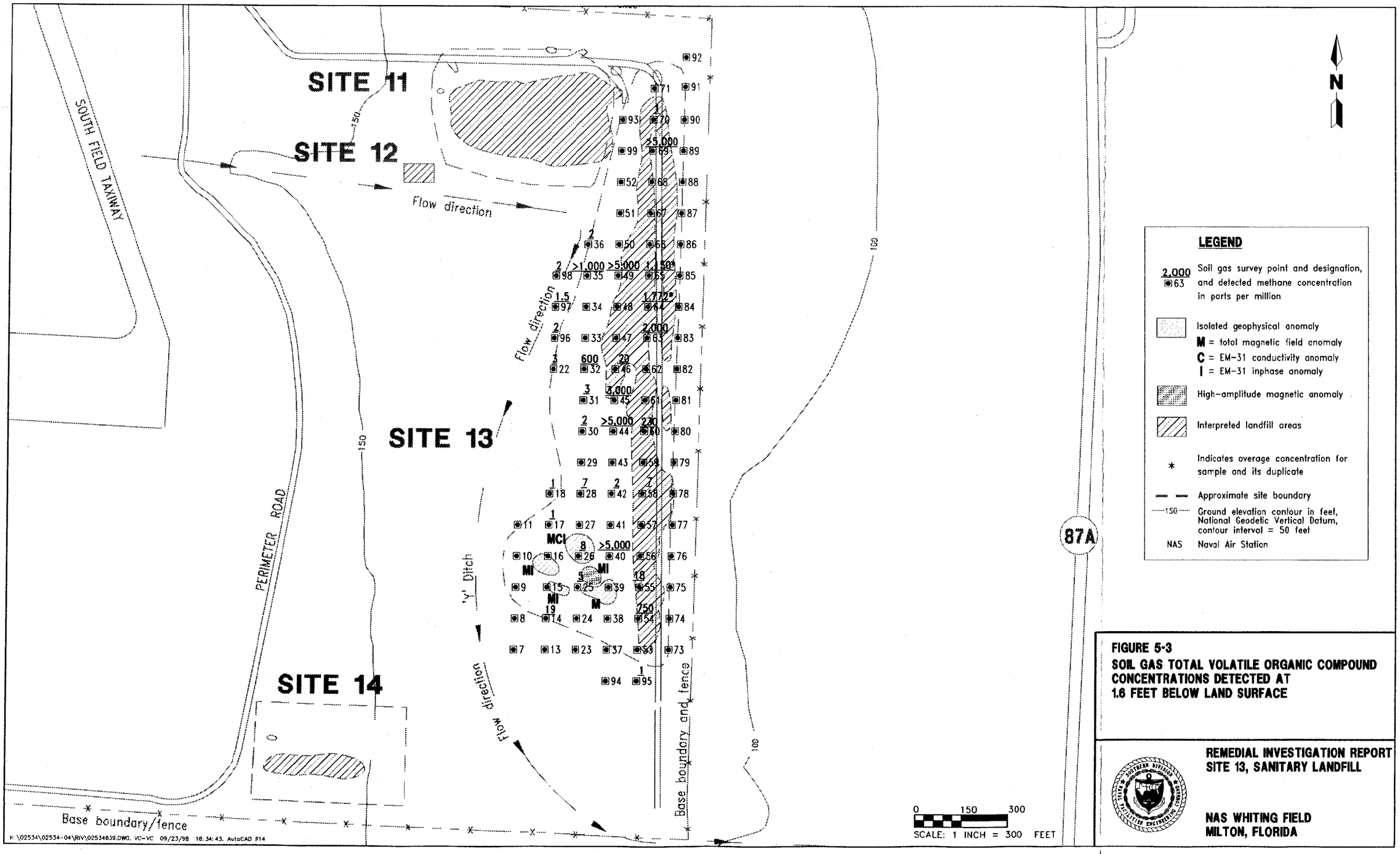


FIGURE 5-3
SOIL GAS TOTAL VOLATILE ORGANIC COMPOUND CONCENTRATIONS DETECTED AT 1.6 FEET BELOW LAND SURFACE

REMEDIAL INVESTIGATION REPORT
SITE 13, SANITARY LANDFILL

NAS WHITING FIELD
MILTON, FLORIDA

00245DB52

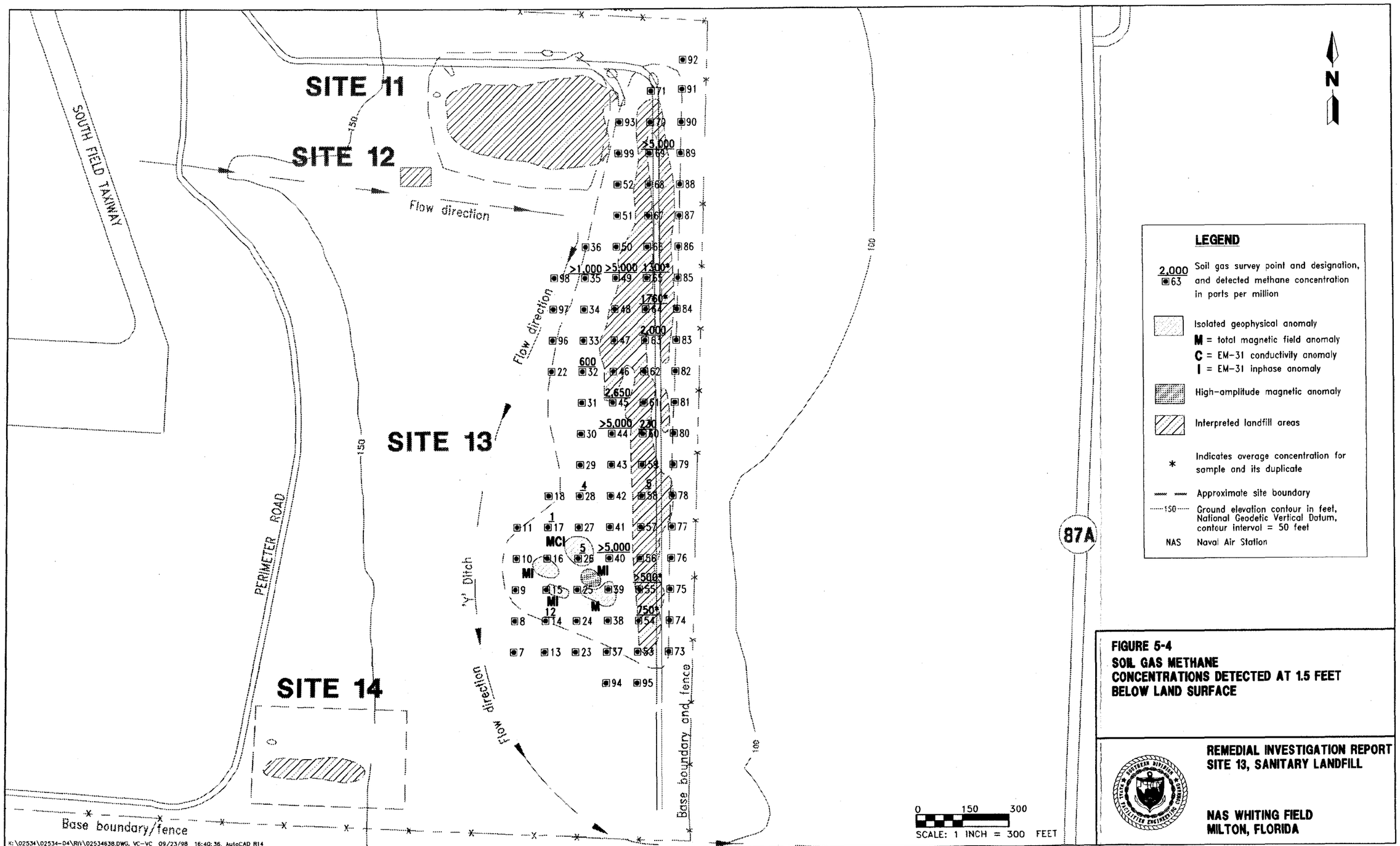


FIGURE 5-4
SOIL GAS METHANE CONCENTRATIONS DETECTED AT 1.5 FEET BELOW LAND SURFACE

REMEDIAL INVESTIGATION REPORT
SITE 13, SANITARY LANDFILL

NAS WHITING FIELD
MILTON, FLORIDA

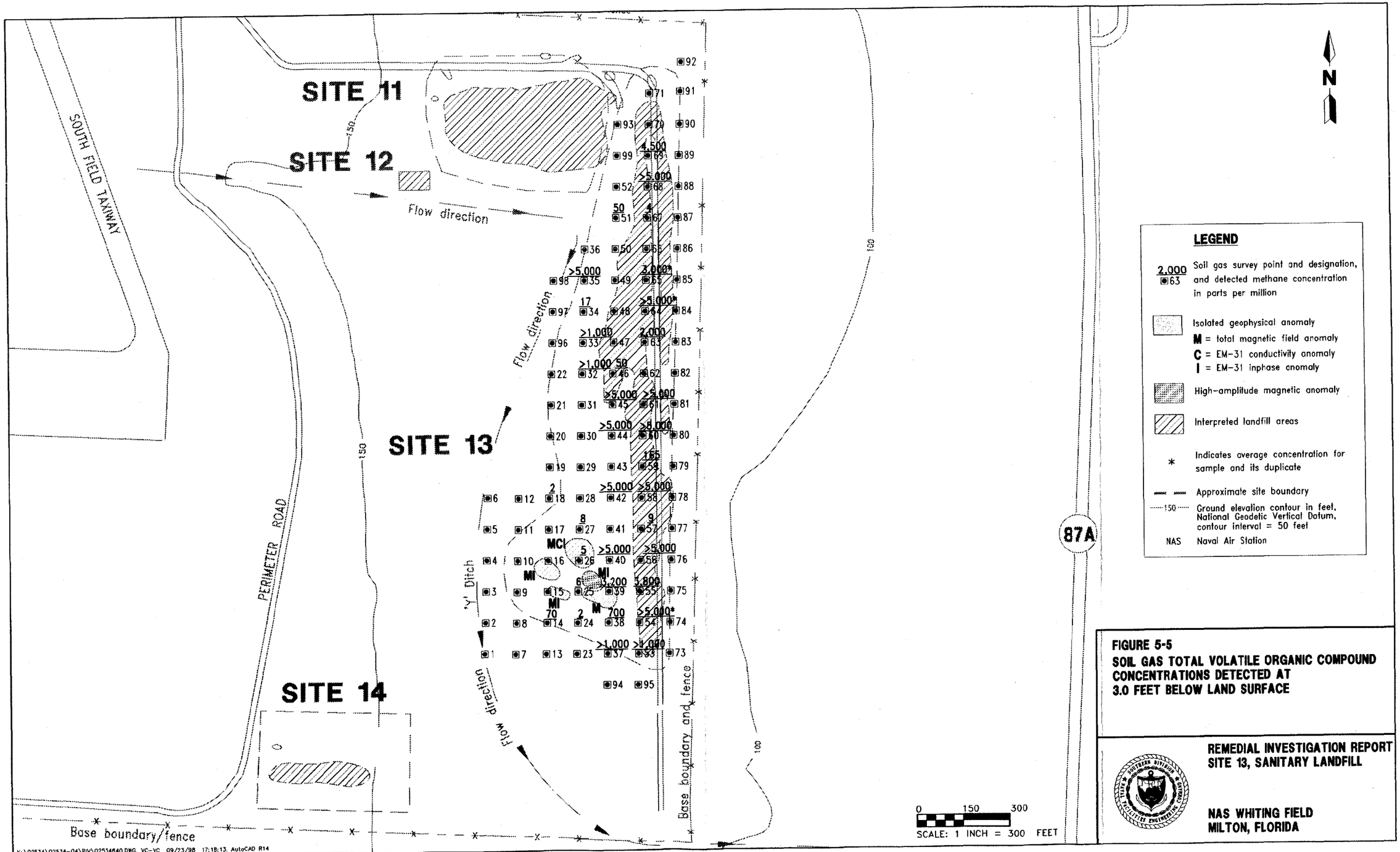


FIGURE 5-5
SOIL GAS TOTAL VOLATILE ORGANIC COMPOUND CONCENTRATIONS DETECTED AT 3.0 FEET BELOW LAND SURFACE

REMEDIAL INVESTIGATION REPORT
SITE 13, SANITARY LANDFILL

NAS WHITING FIELD
MILTON, FLORIDA

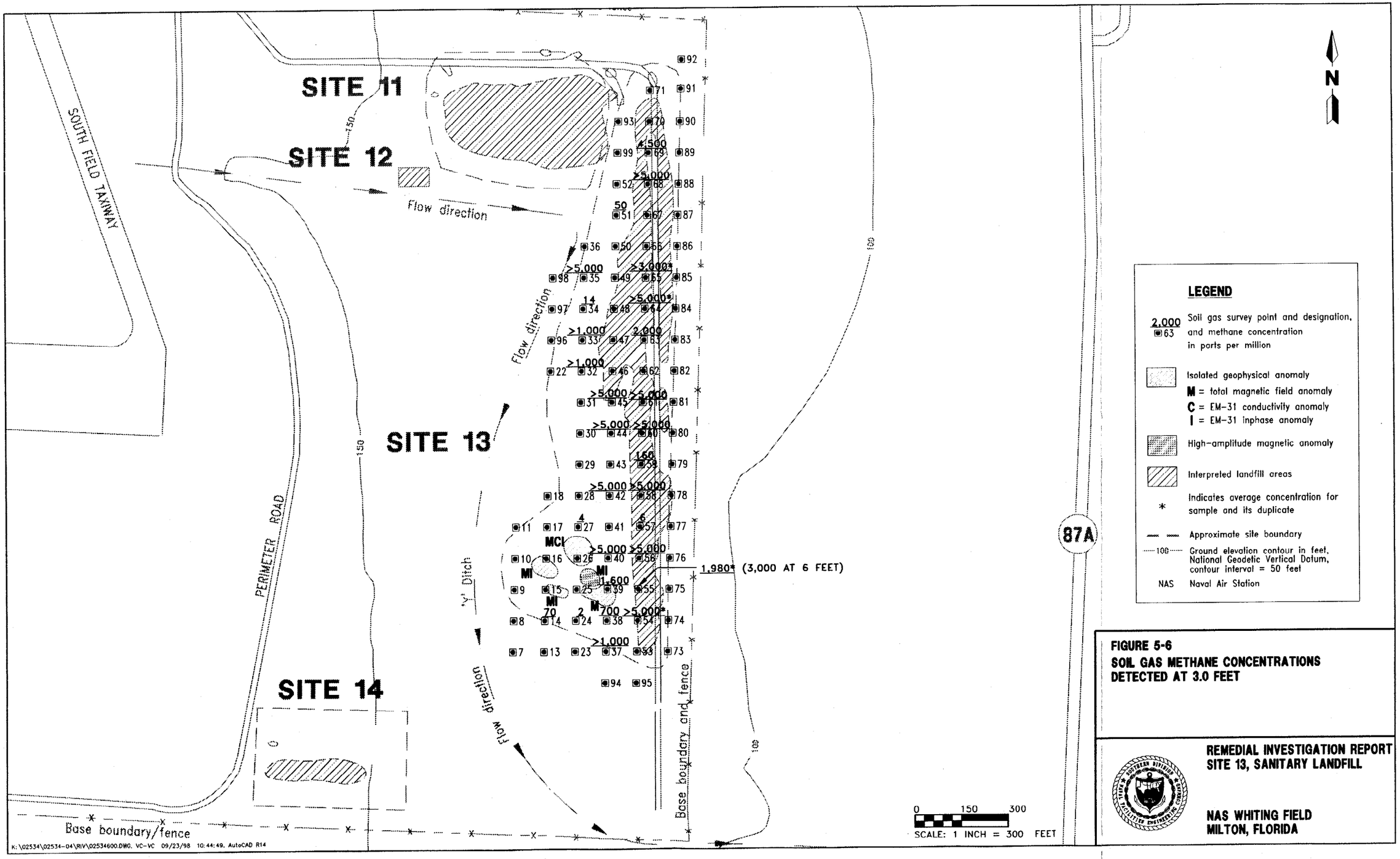


FIGURE 5-6
SOIL GAS METHANE CONCENTRATIONS DETECTED AT 3.0 FEET

REMEDIAL INVESTIGATION REPORT
SITE 13, SANITARY LANDFILL

NAS WHITING FIELD
MILTON, FLORIDA

Table 5-7
Summary of Analytes Detected in Background Surface Soil Samples for the Troup Loamy Sand and Lucy Loamy Sand

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Range of Detection Limits	Range of Detected Concentrations[2]	Mean of Detected Concentrations[3]	Background Screening Values[4]	USEPA Region III RBCs Residential/ Industrial[5]	Soil Cleanup Target Levels for Florida Residential/ Industrial/- Leachability[6]
TCL Volatile Organic Compounds (µg/kg)							
None detected							
TCL Semivolatile Organic Compounds (µg/kg)							
bis(2-Ethylhexyl)phthalate	3/5	360 to 400	57 to 115*	80.3	80.3	[7]46,000/410,000	75,000/280,000/ 3,600,000
Pesticides and PCBs (µg/kg)							
None detected							
Inorganic Analytes (mg/kg)							
Aluminum	9/9	40 to 40	5,080 to 21,300	7,667	15,334	[8]7,800/200,000	72,000/1,000,000/ [12]SPLP
Antimony	2/9	12 to 12	2.9 to 5	4	8	[8]3.1/82	26/240/5
Arsenic	9/9	2 to 2	0.91 to 3.7	1.5	3	[7]0.43/3.8	0.8/[11]4.62/29
Barium	9/9	40 to 40	6 to 26.2	11.9	23.8	[8]550/14,000	110/87,000/1,600
Beryllium	5/9	1 to 1	0.05 to 0.35	0.18	0.36	[7]16/410	120/820/63
Cadmium	2/9	1 to 1	0.22 to 0.355*	0.29	0.58	[8]3.9/100	75/1,300/8
Calcium	9/9	1,000 to 1,000	82 to 269	201	402	--/--	--/--/--
Chromium	9/9	2 to 2	2.4 to 16.3	5.4	10.8	[8,10]23/610	210/420/38
Cobalt	8/9	10 to 10	0.78 to 3*	1.5	3	[8]470/12,000	4,700/110,00/ [12]SPLP
Copper	6/9	5 to 5	2.6 to 8.5	4.7	9.4	[8]310/8,200	110/78,000/[12]SPLP
Iron	9/9	20 to 20	2,630 to 12,400	4,294	8,588	[8]2,300/61,000	230,000/480,000/ [12]SPLP
Lead	9/9	0.6 to 1	2.7 to 9.8	5.7	11.2	[9]400	400/920/[12]SPLP
Magnesium	9/9	1,000 to 1,000	68.8 to 316	129	258	--/--	--/--/--

See notes at end of table.

Table 5-7 (Continued)
Comparison of Analytes Detected in Background Surface Soil Samples for the Troup Loamy Sand and Lucy Loamy Sand

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Range of Detection Limits	Range of Detected Concentrations[2]	Mean of Detected Concentrations[3]	Background Screening Values[4]	USEPA Region III RBCs Residential/ Industrial[5]	Soil Cleanup Target Levels for Florida Residential/ Industrial/- Leachability[6]
Inorganic Analytes (mg/kg) (Continued)							
Manganese	9/9	3 to 3	66.7 to 314	202	404	[8]160/4,100	1,600/22,000/ [12]SPLP
Mercury	4/9	0.1 to 0.1	0.04 to 0.07	0.06	0.12	--/--	5.4/8.7/2.1
Nickel	3/9	8 to 8	1.7 to 5.9	3.6	7.2	[8]160/4,100	110/28,000/130
Potassium	3/9	1,000 to 1,000	81.3* to 96.8	88.5	177	--/--	--/--/--
Selenium	6/9	1 to 1	0.15* to 0.4	0.22	0.44	[8]39/1,000	390/10,000/5
Silver	1/9	2 to 2	0.35 to 0.35	0.35	0.70	[8]39/1,000	380/9,100/34
Sodium	9/9	1,000 to 1,000	125 to 265*	194	388	--/--	--/--/--
Thallium	1/9	2 to 2	0.58* to 0.58*	0.58	1.16	--/--	--/--/--
Vanadium	9/9	10 to 10	6 to 31.1	10.6	21.2	[8]55/1,400	15/7,400/6,000
Zinc	7/9	4 to 4	4.3 to 16.3	7.7	15.4	[8]2,300/61,000	23,000/560,000/ 12,000
Cyanide	2/9	0.5 to 1	0.11 to 0.14	0.13	0.26	160/4,100	30/28,000/40

See notes at end of table.

Table 5-7 (Continued)
Comparison of Analytes Detected in Background Surface Soil Samples for the Troup Loamy Sand and Lucy Loamy Sand

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

[1] Frequency of detection is the number of samples in which the analyte was detected divided by the total number of samples analyzed (excluding rejected values).
[2] Value indicated by an asterisk is the average of a sample and its duplicate. If the target analyte is not detected in either the environmental sample or associated duplicate, the value used for the nondetection is one-half the reporting limit.
[3] The mean of detected concentrations is the arithmetic mean of all environmental samples in which the analyte was detected; it includes a single value for an environmental sample and associated duplicate. The arithmetic mean does not include those environmental samples in which the analyte was not detected.
[4] The background screening value for organics is the mean detected concentration and will not be used for screening purposes in the risk assessment. The background screening value for inorganics is two times the mean detected background concentration and will be used for screening purposes in the risk assessment. Background data is presented in the Whiting Field GIR (HLA, 1998).
[5] *Source: USEPA Region III RBC Table (October 1, 1998).*
[6] Chapter 62-777, Florida Administrative Code, June 1999.
[7] The values correspond to a human cancer risk level of 1 in 1,000,000.
[8] The calculated values correspond to a noncancer hazard quotient of 0.1.
[9] Lead value is from the Revised Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites (OSWER Directive 9355.4-12 [USEPA, 1994a]).
[10] Concentration based on hexavalent chromium.
[11] FDEP-approved Site-Specific Cleanup Goal for Arsenic at Covered Landfill Sites, Naval Air Station Whiting Field (see Appendix G; FDEP, 1998).
[12] Leachability values may be derived using the SPLP test to calculate site-specific soil cleanup target levels (SCTLs) or may be determined using TCLP in the event oily wastes are present.

Notes: USEPA = U.S. Environmental Protection Agency.
RBC = risk-based concentration.
TCL = target compound list.
μg/kg = micrograms per kilogram.
FDEP = Florida Department of Environmental Protection.
SPLP = Synthetic Precipitation Leaching Procedure.
* = average of a sample and its duplicate.
PCB = polychlorinated biphenyl.
mg/kg = milligrams per kilogram.
-- = criteria not available.

Table 5-8 summarizes the analytical results for organic and inorganic analytes detected in surface soil samples (ten field samples and one duplicate) at Site 13. Surface soil samples were collected in August 1992 and December 1995. The sample locations are shown on Figure 3-2. Table 5-9 summarizes the frequency of detection, range of detection limits, range of detection concentrations, mean of detected concentrations, and background screening values for Site 13 surface soil samples. Figure 5-7 presents a summary of surface soil detections above Florida soil cleanup target levels (SCTLs).

TCL VOCs. Methylene chloride was the only VOC detected in the surface soil samples. The detected concentrations were below the residential and industrial values for the SCTLs for Florida and the USEPA Region III RBCs.

TCL SVOCs. Three SVOCs (fluoranthene, pyrene, and BEHP) were detected in the surface soil samples. The detected concentrations were below their respective residential and industrial values for the SCTLs for Florida and the USEPA Region III RBCs.

Pesticides and PCBs. Pesticide and PCB compounds were not detected in the surface soil samples.

Metals and (Total) Cyanide. Twenty TAL metals were detected in one or more of the surface soil samples. Ten TAL metals (aluminum, arsenic, barium, calcium, chromium, iron, manganese, silver, vanadium, and zinc) were detected at concentrations equaling or exceeding their respective background screening values (Table 5-9). Detected concentrations of aluminum, arsenic, chromium, iron, manganese, and vanadium exceeded the residential standards for the USEPA Region III RBCs. Concentrations of arsenic also exceeded the industrial standards for the USEPA Region III RBCs and the residential and industrial standards for the SCTLs for Florida. Several detections of vanadium exceeded the residential SCTL for Florida.

5.6 SUBSURFACE SOIL ASSESSMENT. Table 5-10 summarizes the analytical results for organic and inorganic analytes detected in four subsurface soil samples (three field samples and one field duplicate) collected from test pits excavated in October 1992 at Site 13. The test pit locations are shown on Figure 3-2. Table 5-11 summarizes the frequency of detection, range of detection limits, range of detected concentrations, mean of detected concentrations, and background screening values for Site 13 subsurface soil samples. Figure 5-7 presents a summary of subsurface soil detections above Florida SCTLs.

TCL VOCs. Seven TCL VOCs (acetone, carbon disulfide, 2-butanone, 4-methyl-2-pentanone, 2-hexanone, toluene, and xylenes) were detected in the subsurface soil samples collected from Site 13. All detected concentrations of VOCs were below their respective residential, industrial, and leachability values for the soil cleanup target levels for Florida and the USEPA Region III industrial RBCs.

TCL SVOCs. Five SVOCs (phenol, 4-methylphenol, naphthalene, diethylphthalate, and BEHP) were detected in the subsurface soil samples collected from Site 13. The SVOCs were detected at concentrations below their respective residential and industrial values for the soil cleanup target levels for Florida and the USEPA Region III RBCs. However, phenol and 4-methylphenol were detected at concentrations above the soil leachability cleanup target levels for Florida.

Table 5-8
Organic and Inorganic Analytes Detected in Site 13 Surface Soil Samples

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	13-SL-01	13-SL-02	13-SL-03	13-SL-04	13-SL-05	13-SL-05A Duplicate Sample
Laboratory Sample No:	22526007	22526008	22526009	22526010	22526011	22526012
Collection Date:	18-AUG-92	18-AUG-92	18-AUG-92	18-AUG-92	18-AUG-92	18-AUG-92
Sample Depth (inches bls):	0 to 12	0 to 12	0 to 12	0 to 12	0 to 12	0 to 12
Volatile Organic Compounds (µg/kg)						
Methylene chloride	--	--	--	--	--	--
Semivolatile Organic Compounds (µg/kg)						
Fluoranthene	51 J	--	--	--	--	--
Pyrene	61 J	--	--	--	--	--
bis(2-Ethylhexyl)phthalate	95 J	100 J	--	450	--	64 J
Pesticides and PCBs (µg/kg)						
None detected						
Inorganic Analytes (mg/kg)						
Aluminum	14,100	19,300	10,900	20,900	10,500	8,070
Arsenic	2.9	3.9	3.4	6.9	2.4	2 J
Barium	9.5 J	7.6 J	5.9 J	9.1 J	7.9 J	6.6 J
Beryllium	0.07 J	0.08 J	0.06 J	0.16 J	--	--
Calcium	525 J	143 J	350 J	355 J	78.4 J	92.4 J
Chromium	11.6	18.6	11	17.7	8.2	7.4
Cobalt	--	0.73 J	0.51 J	1.3 J	0.74 J	1 J
Copper	9.2	5.9	7.6	5.2 J	4	4.2 J
Iron	8,150	14,900	8,990	15,500	6,680	4,960
Lead	5.8	5.8	4.6	10.5	3.2	4
Magnesium	172 J	98.9 J	107 J	87.5 J	57.5 J	50.6 J
Manganese	32.8	25.4	18.7	62.1	79.1	77

See notes at end of table.

Table 5-8 (Continued)
Organic and Inorganic Analytes Detected in Site 13 Surface Soil Samples

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	13-SL-01	13-SL-02	13-SL-03	13-SL-04	13-SL-05	13-SL-05A Duplicate Sample
Laboratory Sample No:	22526007	22526008	22526009	22526010	22526011	22526012
Collection Date:	18-AUG-92	18-AUG-92	18-AUG-92	18-AUG-92	18-AUG-92	18-AUG-92
Sample Depth (inches bls):	0 to 12	0 to 12	0 to 12	0 to 12	0 to 12	0 to 12
Inorganic Analytes (mg/kg) (Continued)						
Mercury	0.04 J	0.05 J	0.04 J	0.04 J	0.05 J	0.05 J
Nickel	--	2.8 J	--	--	--	2.9 J
Potassium	--	--	--	--	--	--
Selenium	--	--	--	--	--	--
Silver	0.74 J	0.76 J	0.39 J	1.2 J	0.48 J	0.36 J
Sodium	181 J	202 J	173 J	193 J	176 J	262 J
Vanadium	23.1	41.3	26.5	42	17.5	13.1
Zinc	13.2	8.2 J	7.8 J	10.8 J	17.5	16.1

See notes at end of table.

Table 5-8 (Continued)
Organic and Inorganic Analytes Detected in Site 13 Surface Soil Samples

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	13S00101	13S00201	13S00301	13S00401	13S00501
Laboratory Sample No:	G8895002	G8895003	G8895004	G8895005	G8895006
Collection Date:	08-DEC-95	08-DEC-95	08-DEC-95	08-DEC-95	08-DEC-95
Sample Depth (inches bls):	0 to 12	0 to 12	0 to 12	0 to 12	0 to 12
Volatile Organic Compounds (µg/kg)					
Methylene chloride	--	4 J	4 J	4 J	8 J
Semivolatile Organic Compounds (µg/kg)					
Fluoranthene	--	--	--	--	--
Pyrene	--	--	--	--	--
bis(2-Ethylhexyl)phthalate	--	--	--	--	--
Pesticides and PCBs (µg/kg)					
None detected					
Inorganic Analytes (mg/kg)					
Aluminum	13,200	14,800	38,300	10,200	9,430
Arsenic	2.6	4	6.4	3.6	1.6 J
Barium	26.6 J	7.5 J	14.6 J	9.7 J	11.9 J
Beryllium	--	--	--	--	--
Calcium	47.5 J	34.2 J	127 J	121 J	44.7 J
Chromium	8.8	14.4	27.9	14.3	6.9
Cobalt	1.9 J	0.51 J	1.1 J	0.48 J	0.96 J
Copper	--	--	8	--	--
Iron	8,090	11,800	23,500	11,900	5,620
Lead	7 J	5.1 J	8.3 J	6.6 J	4.7 J
Magnesium	144 J	88.9 J	203 J	92 J	115 J
Manganese	407 J	45.1 J	69 J	57.3 J	159 J

See notes at end of table.

Table 5-8 (Continued)
Organic and Inorganic Analytes Detected in Site 13 Surface Soil Samples

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	13S00101	13S00201	13S00301	13S00401	13S00501
Laboratory Sample No:	G8895002	G8895003	G8895004	G8895005	G8895006
Collection Date:	08-DEC-95	08-DEC-95	08-DEC-95	08-DEC-95	08-DEC-95
Sample Depth (inches bls):	0 to 12	0 to 12	0 to 12	0 to 12	0 to 12
Inorganic Analytes (mg/kg) (Continued)					
Mercury	0.03 J	0.01 J	0.02 J	0.02 J	0.02 J
Nickel	4.3 J	3.9 J	6.7 J	2.9 J	3.3 J
Potassium	--	--	150 J	--	--
Selenium	--	--	0.27 J	--	--
Silver	--	--	--	--	--
Sodium	--	--	--	--	--
Vanadium	19.8	32.4	62.4	31.8	14.5
Zinc	--	--	--	--	--

Notes: bls = below land surface.
µg/kg = micrograms per kilogram.
-- = concentration of analyte, if present, was less than detection limit.
J = estimated value.
PCB = polychlorinated biphenyl.
mg/kg = milligrams per kilogram.

Table 5-9
Comparison of Analytes Detected in Site 13 Surface Soil Samples to Background Screening and Benchmark Concentrations

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Range of Detection Limits	Range of Detected Concentrations[2]	Background Screening Values[3]	USEPA Region III RBCs Residential/ Industrial[4]	Soil Cleanup Target Levels for Florida Residential/ Industrial/Leachability[5]
TCL Volatile Organic Compounds (µg/kg)						
Methylene chloride	4/10	11 to 15	4 to 8	ND	[6]85,000/760,000	16,000/23,000/20
TCL Semivolatile Organic Compounds (µg/kg)						
Fluoranthene	1/10	370 to 395	51	ND	[7]310,000/8,200,000	2,900,000/48,000,000/ 1,200,000
Pyrene	1/10	370 to 395	61	ND	[7]230,000/6,100,000	2,200,000/37,000,000/ 880,000
bis(2-Ethylhexyl)phthalate	4/10	370 to 395	95 to 450	80.3	[6]46,000/410,000	76,000/280,000/ 3,600,000
Pesticides and PCBs (µg/kg)						
None Detected						
Inorganic Compounds (mg/kg)						
Aluminum	10/10	40	9,285* to 38,300	15,334	[7]7,800/200,000	72,000/1,000,000/SPLP[11]
Arsenic	10/10	2	1.6 to 6.9	3	[6]0.43/3.8	0.8/[10]4.62/29
Barium	10/10	40	5.9 to 26.6	23.8	[7]550/14,000	110/87,000/1,600
Beryllium	4/10	0.06 to 1	0.06 to 0.16	0.36	[7]16/410	120/820/63
Calcium	10/10	1,000	34.2 to 525	402	--/--	--/--/--
Chromium	10/10	2	6.9 to 27.9	10.8	[7]23/610	210/420/38
Cobalt	9/10	0.34 to 10	0.48 to 1.9	3	[7]470/12,000	4,700/110,000/SPLP[11]
Copper	6/10	5	4.1* to 9.2	9.4	[7]310/8,200	110/78,000/SPLP[11]
Iron	10/10	20	5,620 to 23,500	8,588	[7]2,300/61,000	23,000/480,000/SPLP[11]
Lead	10/10	0.6 to 1	3.6* to 10.5	11.2	[8]400	400/920/SPLP[11]
Magnesium	10/10	1,000	54.1* to 203	258	--/--	--/--/--

See notes at end of table.

Table 5-9 (Continued)
Comparison of Analytes Detected in Site 13 Surface Soil Samples to Background Screening and Benchmark Concentrations

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Range of Detection Limits	Range of Detected Concentrations[2]	Background Screening Values[3]	USEPA Region III RBCs Residential/ Industrial[4]	Soil Cleanup Target Levels for Florida Residential/ Industrial/Leachability[5]
Inorganic Compounds (mg/kg) (Continued)						
Manganese	10/10	3	18.7 to 407	404	[7]160/4,100	1,600/22,000/SPLP[11]
Mercury	10/10	0.01 to 0.05	0.01 to 0.05	0.12	2.3/61	5.4/8.7/2.1
Nickel	7/10	2.4 to 8	2.075* to 6.7	7.2	[7]160/4,100	110/28,000/130
Potassium	1/10	132 to 1,000	150	177	--/--	--/--/--
Selenium	1/10	0.46 to 1	0.27	0.44	[7]39/1,000	390/10,000/5
Silver	5/10	2	0.39 to 1.2	0.7	[7]39/1,000	390/9,100/17
Sodium	5/10	1,000	173 to 219*	388	--/--	--/--/--
Vanadium	10/10	10	14.5 to 62.4	21.2	[7]55/1,400	15/7,400/6,000
Zinc	5/10	4	7.8 to 16.8*	15.4	[7]2,300/61,000	23,000/560,000/12,000

See notes at end of table.

Table 5-9 (Continued)
Comparison of Analytes Detected in Site 13 Surface Soil Samples to Background Screening and Benchmark Concentrations

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

[1] Frequency of detection is the number of samples in which the analyte was detected divided by the total number of samples analyzed (excluding rejected values).
[2] Value indicated by an asterisk is the average of a sample and its duplicate. If the target analyte is not detected in either the environmental sample or associated duplicate, the value used for the nondetection is one-half the reporting limit.
[3] The background screening value for organics is the mean detected concentration and will not be used for screening purposes in the risk assessment. The background screening value for inorganics is two times the mean detected background concentration and will be used for screening purposes in the risk assessment. Background data is summarized in Table 5-7 and presented in the NAS Whiting Field GIR (HLA, 1998).
[4] Source: USEPA Region III RBC Table (October 1, 1998).
[5] Source: Chapter 62-777, Florida Administrative Code, June 1999.
[6] The values correspond to a human cancer risk level of 1 in 1,000,000.
[7] The calculated values correspond to a noncancer hazard quotient of 0.1.
[8] USEPA (1994) Office of Solid Waste and Emergency Response Directive No. 9355.4-12, Revised Interim Recommended Soil Cleanup for CERCLA and RCRA Sites.
[9] Values are for hexavalent chromium.
[10] FDEP-approved Site-Specific Cleanup Goal for Arsenic at Covered Landfill Sites, Naval Air Station Whiting Field (see Appendix H; FDEP, 1998).
[11] Leachability values may be derived using the SPLP test to calculate site-specific soil cleanup target levels (SCTLs) or may be determined using TCLP in the event oily wastes are present.

Notes: USEPA = U.S. Environmental Protection Agency.
RBC = risk-based concentration.
TCL = target compound list.
μg/kg = micrograms per kilogram.
ND = not detected.
PCB = polychlorinated biphenyl.
mg/kg = milligrams per kilogram.
* = average of a sample and its duplicate.
-- = criteria not available.
SPLP = Synthetic Precipitation Leaching Procedure.

Table 5-10
Organic and Inorganic Analytes Detected in Subsurface Soil Samples from Test Pits at Site 13

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	13SS0201	13SS0302	13SS0503	13SS0503A Duplicate Sample
Laboratory Sample No:	22927002	22927003	22927005	22927006
Collection Date:	06-OCT-92	06-OCT-92	06-OCT-92	06-OCT-92
Sample Depth (ft bls):	5 to 6	8 to 10	8 to 9	8 to 9
Volatile Organic Compounds (µg/kg)				
Acetone	86 J	67 J	700 J	580 J
Carbon disulfide	--	2 J	--	--
2-Butanone	--	--	270	270
4-Methyl-2-pentanone	--	--	27 J	34
2-Hexanone	--	3 J	--	19 J
Toluene	--	--	--	10 J
Xylenes (total)	2 J	2 J	--	12 J
Semivolatile Organic Compounds (µg/kg)				
Phenol	--	--	130 J	130 J
4-Methylphenol	--	68 J	1,200	990
Naphthalene	--	--	510	140 J
Diethylphthalate	--	--	140 J	99 J
bis(2-Ethylhexyl)phthalate	--	--	410 J	--
Pesticides and PCBs (µg/kg)				
None Detected				
Inorganic Analytes (mg/kg)				
Aluminum	23,900	10,700	14,800	11,500
Antimony	--	--	3.7 J	--

See notes at end of table.

Table 5-10 (Continued)
Organic and Inorganic Analytes Detected in Subsurface Soil Samples from Test Pits at Site 13

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	13SS0201	13SS0302	13SS0503	13SS0503A Duplicate Sample
Laboratory Sample No:	22927002	22927003	22927005	22927006
Collection Date:	06-OCT-92	06-OCT-92	06-OCT-92	06-OCT-92
Sample Depth (ft bls):	5 to 6	8 to 10	8 to 9	8 to 9
Inorganic Analytes (mg/kg)				
Arsenic	6.5	4.7	4.1	3.4
Barium	7.5 J	6.3 J	7.1 J	7 J
Beryllium	0.2 J	0.16 J	0.17 J	0.16 J
Calcium	130 J	151 J	192 J	194 J
Chromium	21	15.9	17.3	16.2
Cobalt	1.4 J	0.75 J	1.3 J	0.63 J
Copper	5.8 J	3.9 J	5 J	5.3 J
Iron	16,200	13,500	15,600	12,200
Lead	6	5.8	4.7	5.5
Magnesium	97.7 J	73.2 J	74.8 J	72.9 J
Manganese	41.6	21.7	22.5	15.1
Mercury	0.2 J	0.16 J	4.2	0.08 J
Nickel	2.1 J	--	--	--
Potassium	--	--	180 J	--
Silver	0.53 J	0.5 J	0.62 J	0.52 J
Sodium	206 J	211 J	206 J	195 J
Vanadium	44.6	38.2	40.1	34.9
Zinc	10.2	6	7.3	6.8
Cyanide	--	--	--	0.12 J

Notes: bls = below land surface.
µg/kg = micrograms per kilogram.
J = estimated value.
-- = concentration of analyte, if present, was less than detection limit..
PCB = polychlorinated biphenyl.
mg/kg = milligrams per kilogram.

Table 5-11
Comparison of Analytes Detected in Subsurface Soil Samples to Background Screening and Benchmark Concentrations

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Range of Detection Limits	Range of Detected Concentrations[2]	Background Screening Values[3]	USEPA Region III RBCs Industrial[4]	Soil Cleanup Target Levels for Florida Residential/ Industrial/Leachability[5]
TCL Volatile Organic Compounds (µg/kg)						
Acetone	3/3	11 to 43.5	67 to 640*	ND	[7]20,000,000	780,000/5,500,000/2,800
Carbon disulfide	1/3	11 to 43.5	2	ND	[7]20,000,000	200,000/1,400,000/5,600
2-Butanone	1/3	11 to 43.5	270*	ND	[7]120,000,000	3,100,000/21,000,000/17,000
4-Methyl-2-pentanone	1/3	11 to 43.5	30.5*	ND	[7]16,000,000	220,000/1,500,000/2,600
2-Hexanone	2/3	11 to 43.5	3 to 23.5*	ND	[7]8,200,000	5,100/34,000/1,400
Toluene	1/3	11 to 43.5	19*	ND	[7]41,000,000	380,000/2,600,000/500
Xylenes (total)	3/3	11 to 43.5	2 to 20*	ND	[7]410,000,000	5,900,000/ 40,000,000/200
TCL Semivolatile Organic Compounds (µg/kg)						
Phenol	1/3	380 to 430	130*	ND	[7]120,000,000	900,000/390,000,000/50
4-Methylphenol	2/3	380 to 430	68 to 1,095*	ND	[7]1,000,000	250,000/3,000,000/30
Naphthalene	1/3	380 to 430	325*	ND	[7]4,100,000	40,000/270,000/1,700
Diethylphthalate	1/3	380 to 430	119.5*	ND	[7]160,000,000	54,000,000/920,000,000/ 86,000
bis(2-Ethylhexyl)phthalate	1/3	390 to 430	307.5*	ND	[6]410,000	76,000/280,000/ 3,600,000
Pesticides and PCBs (µg/kg)						
None detected						
Inorganic Analytes (mg/kg)						
Aluminum	3/3	40 to 40	10,700 to 23,900	27,800	[7]200,000	72,000/1,000,000/SPLP[11]
Antimony	1/3	2.8 to 7.45	2.6	8	[7]82	26/240/5
Arsenic	3/3	2 to 2	3.75 to 6.5	6.2	[6]3.8	0.8/[10]4.62/29
Barium	3/3	40 to 40	6.3 to 7.5	15.8	[7]14,000	110/87,000/1,600

See notes at end of table.

Table 5-11 (Continued)
Comparison of Analytes Detected in Subsurface Soil Samples to Background Screening and Benchmark Concentrations

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Range of Detection Limits	Range of Detected Concentrations[2]	Background Screening Values[3]	USEPA Region III RBCs Industrial[4]	Soil Cleanup Target Levels for Florida Residential/ Industrial/Leachibility[5]
Inorganic Analytes (mg/kg) (Continued)						
Beryllium	3/3	1 to 1	0.16 to 0.2	0.26	[7]410	120/820/63
Calcium	3/3	1,000 to 1,000	130 to 194	444	--	--/--/--
Chromium[9]	3/3	2 to 2	15.9 to 21	22.8	[7]1,000	210/420/38
Cobalt	3/3	10 to 10	0.75 to 1.4	1.5	[7]610	4,700/110,000/SPLP[11]
Copper	3/3	5 to 5	3.9 to 5.8	8.8	[7]8,200	110/78,000/SPLP[11]
Cyanide	1/3	0.1 to 0.55	0.12*	ND	[7]4,100	30/28,000/40
Iron	3/3	20 to 20	13,500 to 16,200	18,100	[7]61,000	--/--/--
Lead	3/3	1 to 1	5.1*	8.4	[8]400	400/920/SPLP[11]
Magnesium	3/3	1,000 to 1,000	73.2 to 97.7	272	--	--/--/--
Manganese	3/3	3 to 3	18.8* to 41.6	42.6	[7]4,100	1,600/22,000/SPLP[11]
Mercury	3/3	0.1 to 0.1	0.16 to 2.14*	ND	[7]61	5.4/8.7/2.1
Nickel	1/3	1.2 to 8	2.1	5	[7]4,100	110/28,000/130
Potassium	1/3	154 to 570	125*	181	--	--/--/--
Silver	3/3	2 to 2	0.5 to 0.57*	1.12	[7]1,000	390/9,100/17
Sodium	3/3	1,000 to 1,000	200.5* to 211	ND	--	--/--/--
Vanadium	3/3	10	37.5* to 44.6	45	[7]1,400	15/7,400/6,000
Zinc	3/3	4 to 4	6 to 10.2	15.6	[7]61,000	23,000/560,000/12,000

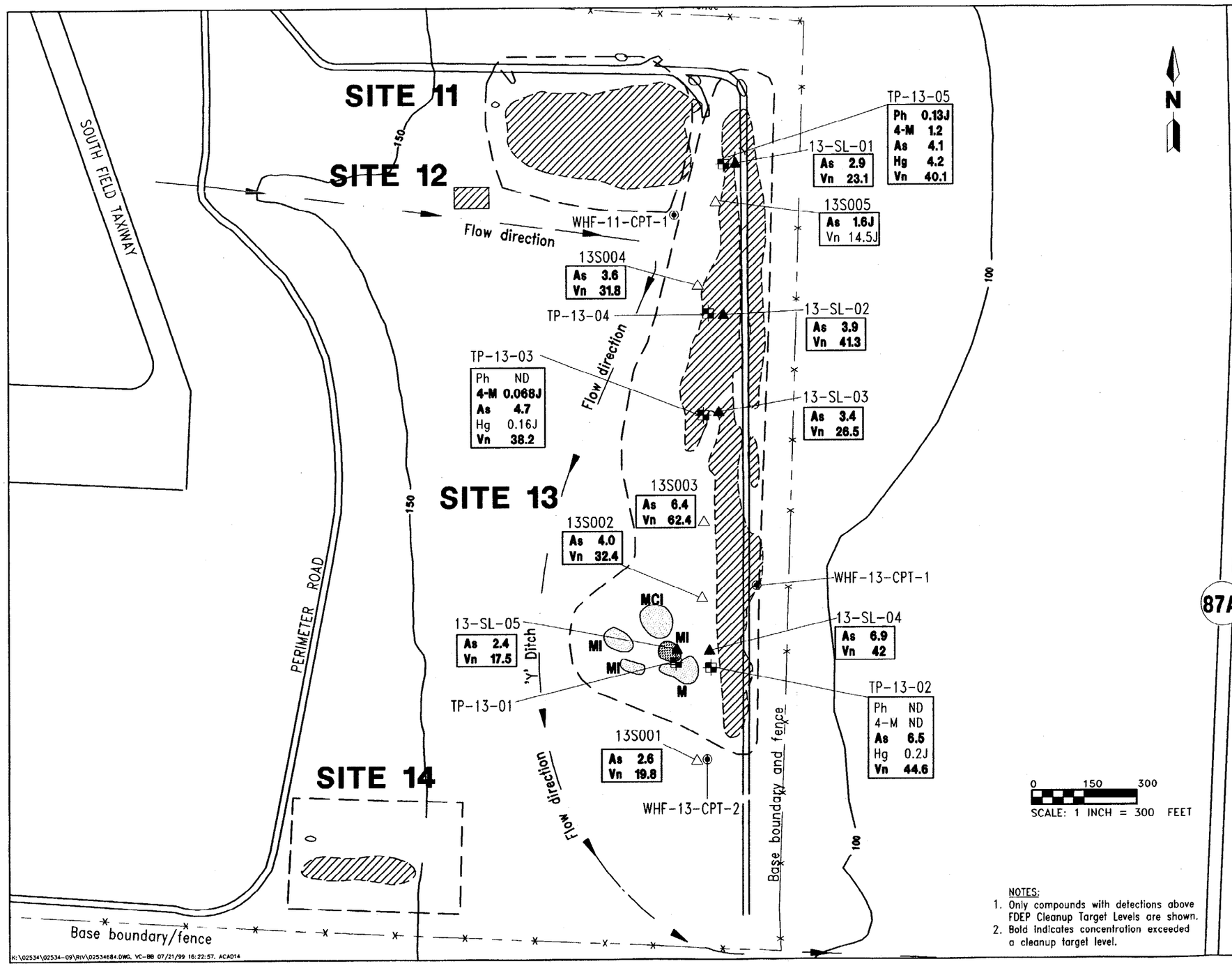
See notes at end of table.

Table 5-11 (Continued)
Comparison of Analytes Detected in Subsurface Soil Samples to Background Screening and Benchmark Concentrations

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

[1] Frequency of detection is the number of samples in which the analyte was detected divided by the total number of samples analyzed (excluding rejected values).
[2] Value indicated by an asterisk is the average of a sample and its duplicate. If the target analyte is not detected in either the environmental sample or associated duplicate, the value used for the nondetection is one-half the reporting limit.
[3] The background screening value for organics is the mean detected concentration and will not be used for screening purposes in the risk assessment. The background screening value for inorganics is two times the mean detected background concentration and will be used for screening purposes in the risk assessment. Background data is presented in the NAS Whiting Field GIR (HLA, 1998).
[4] Source: USEPA Region III RBC Table (October 1, 1998).
[5] Source: Chapter 62-777, Florida Administrative Code, June 1999.
[6] The values correspond to a human cancer risk level of 1 in 1,000,000.
[7] The calculated values correspond to a noncancer hazard quotient of 0.1.
[8] USEPA (1994) Office of Solid Waste and Emergency Response Directive No. 9355.4-12, Revised Interim Recommended Soil Cleanup for CERCLA and RCRA Sites.
[9] Values are for hexavalent chromium.
[10] FDEP-approved Site-Specific Soil Cleanup Goal for Arsenic at Covered Landfill Sites, Naval Air Station Whiting Field (see Appendix H; FDEP, 1998)
[11] Leachability values may be derived using the SPLP test to calculate site-specific soil cleanup target levels (SCTLs) or may be determined using TCLP in the event oily wastes are present.

Notes: USEPA = U.S. Environmental Protection Agency.
RBC = risk-based concentration.
TCL = target compound list.
µg/kg = micrograms per kilogram.
* = average of a sample and its duplicate.
ND = not detected.
-- = criteria not available.
PCB = polychlorinated biphenyl.
mg/kg = milligrams per kilogram.
SPLP = Synthetic Precipitation Leaching Procedure.



NOTES:
1. Only compounds with detections above FDEP Cleanup Target Levels are shown.
2. Bold indicates concentration exceeded a cleanup target level.

LEGEND

WHF-13-CPT-2	PCPT exploration and designation
TP-13-02	Phase IIA test pit location and designation
13-SL-03	Phase IIA surface soil sample and designation
13S004	Phase IIB surface soil sample and designation
	Isolated geophysical anomaly **M** = total magnetic field anomaly **C** = EM-31 conductivity anomaly **I** = EM-31 inphase anomaly
	High-amplitude magnetic anomaly
	Interpreted landfill areas
— —	Approximate site boundary
— 100 —	Ground elevation contour in feet, National Geodetic Vertical Datum, contour interval = 50 feet
NAS	Naval Air Station
PCPT	Piezocone penetrometer test
As	Arsenic
Ph	Phenol
4-M	4-Methlplenol
Vn	Vanadium
Hg	Mercury
J	Duplicate
ND	Not detected
FDEP	Florida Department of Environmental Protection

FDEP Cleanup Target Levels
(in milligrams per kilograms)

	Residential	Industrial	Leachability
Arsenic	0.8	4.62	29
Phenol	900	390,000	0.050
4-Methylplenol	250	3,000	0.030
Vanadium	15	7,400	6,000
Mercury	5.4	8.7	2.1

FIGURE 5-7
SOIL ANALYTICAL RESULTS

REMEDIAL INVESTIGATION REPORT
SITE 13, SANITARY LANDFILL

NAS WHITING FIELD
MILTON, FLORIDA

K:\02534\02534-09\RIV\02534684.DWG, VC-BB 07/21/99 16:22:57, ACAD14

00245D06Z

Pesticides and PCBs. Pesticide and PCB compounds were not detected in the subsurface soil samples collected from Site 13.

TAL Metals and (Total) Cyanide. Twenty-one inorganic analytes were detected in the subsurface soil samples from Site 13. Cyanide (total) was detected in the duplicate sample only (13SS0503A) at an estimated (J) concentration.

The inorganic analytes arsenic, cyanide, mercury, and sodium were detected at concentrations exceeding their respective background screening values. Arsenic was detected at concentrations exceeding the soil cleanup target levels for Florida and USEPA Region III RBCs. Detections of mercury slightly exceeded the Florida soil leachability cleanup target level and vanadium was detected at concentrations exceeding the Florida soil residential cleanup target level.

5.7 GROUNDWATER ASSESSMENT. The groundwater assessment at Site 13 consisted of collecting three groundwater samples using a PCPT and BAT sampler during Phase I, and collecting groundwater samples from seven monitoring wells during Phases IIA and IIB.

5.7.1 Phase I Groundwater Samples The RI Phase I investigation at Site 13 consisted of collecting three groundwater samples from two locations shown on Figure 3-2 (sample location designations WHF-13-CPT-1 and WHF-13-CPT-2). The groundwater samples were collected from shallow depths (water table) and from the deeper sand and gravel aquifer and analyzed for VOCs and TAL inorganic analytes at an off-site laboratory.

No VOCs were detected in the groundwater samples at concentrations above detection limits.

Two inorganics (chromium and zinc) were detected in groundwater samples from the Southeast Disposal Area, including Site 13. Detected concentrations of both compounds were below their respective background values. Results of the PCPT and BAT sampling event are summarized in the RI Phase I Technical Memorandum No. 5 (ABB-ES, 1995e).

The groundwater samples collected using the BAT sampler were considered appropriate for preliminary screening but not appropriate to support risk assessment conclusions or decision-making relative to response actions. These results were used to support Phase II monitoring well placement and groundwater sampling efforts.

5.7.2 Phase II Groundwater Samples Table 5-12 presents field parameter data and Table 5-13 presents the analytical results for groundwater samples collected at Site 13 during the Phase IIA (1993) and Phase IIB (1996 and 1997) sampling events. The locations of the Site 13 monitoring wells are shown on Figure 3-2.

A summary of groundwater detections above Florida cleanup target levels is presented in Figure 5-8.

Below is a discussion of the analytical results for the Phase IIA and IIB groundwater sampling events.

Table 5-12
Summary of Groundwater Field Parameters, Site 13

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Monitoring Well Designation	Date Sampled	pH (SU)	Temperature (°C)	Specific Conductance (μmhos/cm)	Turbidity (NTU)	Redox (mV)	DO (percent)
WHF-13-1	11-2-93	5.61	21.2	135	6.57	--	--
	9-10-96	5.86	23.8	137	18.4	--	--
WHF-13-1S	11-2-93	6.00	19.5	185	8.64	--	--
	9-9-96	5.77	22.1	178	3.0	--	--
WHF-13-1I	9-9-96	5.96	25.5	255	0.80	--	--
WHF-13-2	11-2-93	5.90	23.9	40	19.3	--	--
	9-10-96	4.60	23.3	26	0.90	--	--
WHF-13-3S	6-16-97	4.76	22	55	9.5	428.9	9.0
WHF-13-4S	6-16-97	4.74	24	40	6.0	384.5	14
	10-28-97	5.40	16	32	5.0	--	--

Notes: SU = standard unit.
°C = degrees Celsius.
μmhos/cm = micromhos per centimeter.
NTU = nephelometric turbidity unit.
Redox = oxidation reduction potential.
mV = millivolt.
DO = dissolved oxygen.
-- = not measured.

Table 5-13
Organic, Inorganic, and Water Quality Parameters Measured in Site 13 Groundwater Samples

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

	Phase IIA			Phase IIB		
Monitoring Well No.	WHF-13-1	WHF-13-1S	WHF-13-2S	WHF-13-1S	WHF-13-1I	WHF-13-1D
Sample Identifier:	WHF-13-1	WHF-13-1B	WHF-13-2	13G00101	13G00102	13G00103
Laboratory Sample Number:	90198002	90198001	90198003	RC092002	RC092003	RC092005
Date Sampled:	02-NOV-93	02-NOV-93	02-NOV-93	09-SEP-96	09-SEP-96	10-SEP-96
Volatile Organic Compounds (µg/ℓ)						
Acetone	--	--	70 J	--	--	--
Carbon disulfide	--	--	--	--	--	1 J
1,1-Dichloroethane	--	--	--	9 J	--	--
1,2-Dichloroethene (total)	--	--	--	5 J	--	--
Trichloroethene	--	--	--	7 J	--	--
Tetrachloroethene	--	--	--	1 J	--	--
Semivolatile Organic Compounds (µg/ℓ)						
bis(2-Ethylhexyl)phthalate	--	--	10	--	--	--
Pesticides and PCBs (µg/ℓ)						
None detected						
Inorganic Analytes (µg/ℓ)						
Aluminum	100 J	8,740	111 J	81.6 J	206	82.4 J
Arsenic	--	2.3 J	--	1.1 J	--	--
Barium	84.3 J	82 J	46 J	114 J	64.9 J	69.2 J
Cadmium	--	--	12.6	--	--	--
Calcium	24,500	28,000	2,860 J	8,440	44,900	26,400
Chromium	--	19.1	--	--	--	--
Copper	--	11 J	3.9 J	--	1.2 J	--
Iron	9,910	16,000	141	39,600	296	2,780
Lead	1.9 J	3.6	--	0.6 J	2.2 J	2.3 J
Magnesium	2,810 J	3,410 J	1,500 J	5,180	5,890	2,790 J
Manganese	111	142	28.6	78.1	753	17.5
Mercury	0.22	--	--	--	--	--
Potassium	1,580 J	1,660 J	--	1,520 J	717 J	1,310 J
Selenium	--	--	--	--	--	--
Sodium	2,420 J	8,280	1,880 J	6,620	8,170	2,460 J
Vanadium	--	43.4 J	--	--	--	--
Zinc	239	21.6	16.9 J	9 J	735	223
Cyanide	--	--	--	--	--	2.8 J

See notes at end of table.

Table 5-13 (Continued)
Organic, Inorganic, and Water Quality Parameters Measured in Site 13 Groundwater Samples

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

	Phase IIA			Phase IIB		
Monitoring Well No.	WHF-13-1	WHF-13-1S	WHF-13-2S	WHF-13-1S	WHF-13-1I	WHF-13-1D
Sample Identifier:	WHF-13-1	WHF-13-1B	WHF-13-2S	13G00101	13G00102	13G00103
Laboratory Sample Number:	90198002	90198001	90198003	RC092002	RC092003	RC092005
Date Sampled:	02-NOV-93	02-NOV-93	02-NOV-93	09-SEP-96	09-SEP-96	10-SEP-96
Groundwater Quality (mg/ℓ)						
Alkalinity as $CaCO_3$	NA	NA	NA	64	93	41
Chloride	NA	NA	NA	11	--	--
Hardness as $CaCO_3$	NA	NA	NA	46	156	92
Nitrate-Nitrite	NA	NA	NA	--	--	18
Sulfate	NA	NA	NA	8.82	69.2	40.7
Total dissolved solids	NA	NA	NA	102	208	112
Total organic carbon	NA	NA	NA	2.7	1.3	1.7

See notes at end of table.

Table 5-13 (Continued)
Organic, Inorganic, Water Quality Parameters Measured in Site 13 Groundwater Samples

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

	Phase IIB					
Monitoring Well No.	WHF-13-1D	WHF-13-2S	WHF-13-3S	WHF-13-3S	WHF-13-4S	WHF-13-4S
Sample Identifier:	13G00103F Filtered Sample	13G00201	13G00301	13G00301F Filtered Sample	13G00401	13G00401
Laboratory Sample Number:	RC092010	RC092004	MD985002	MD985003	MD985002	MF004006
Date Sampled:	10-SEP-96	10-SEP-96	16-JUN-97	16-JUN-97	16-JUN-97	28-OCT-97
Volatile Organic Compounds (µg/ℓ)						
Acetone	NA	--	--	NA	--	--
Carbon disulfide	NA	3 J	--	NA	--	--
1,1-Dichloroethane	NA	--	--	NA	--	--
1,2-Dichloroethene (total)	NA	--	--	NA	3 J	2 J
Trichloroethene	NA	--	--	NA	--	--
Tetrachloroethene	NA	--	--	NA	--	--
Semivolatile Organic Compounds (µg/ℓ)						
bis(2-Ethylhexyl)phthalate	NA	--	--	NA	--	NA
Pesticides and PCBs (µg/ℓ)						
None Detected						
Inorganic Analytes (µg/ℓ)						
Aluminum	--	--	409 J	382 J	37.9 J	NA
Arsenic	--	--	--	--	--	NA
Barium	66.6 J	33 J	163	162	69.6	NA
Cadmium	--	--	--	--	--	NA
Calcium	26,500	1,810 J	2,410	2,460	2,550	NA
Chromium	--	--	--	--	--	NA
Copper	--	--	--	--	--	NA
Iron	377	--	424 J	407 J	146 J	NA
Lead	0.7 J	0.6 J	--	--	--	NA
Magnesium	2,800 J	866 J	3,570	3,550	2,020	NA
Manganese	16.7	3.1 J	11.1 J	11.1 J	16.4 J	NA
Mercury	--	--	--	--	--	NA
Potassium	1,220 J	--	--	--	--	NA
Selenium	--	0.61 J	--	--	--	NA
Sodium	2,500 J	2,100 J	1,780 J	1,800 J	2,030 J	NA
Vanadium	--	--	--	--	--	NA
Zinc	233		--	--	--	NA
Cyanide	NA	--	--	NA	--	NA

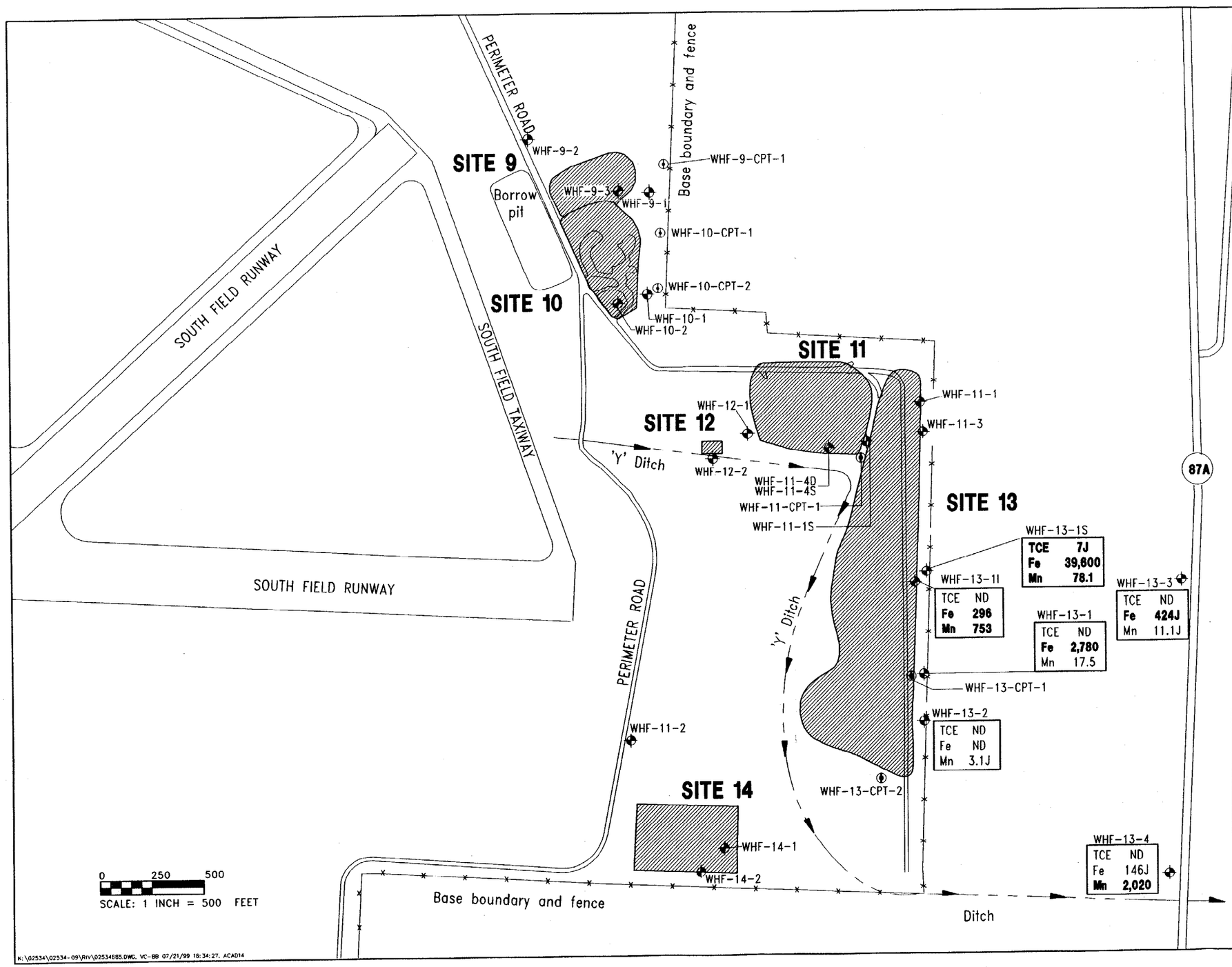
See notes at end of table.

Table 5-13 (Continued)
Organic, Inorganic, Water Quality Parameters Measured in Site 13 Groundwater Samples

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

	Phase IIB					
Monitoring Well No.	WHF-13-1D	WHF-13-2S	WHF-13-3S	WHF-13-3S	WHF-13-4S	WHF-13-4S
Sample Identifier:	13G00103F	13G00201	13G00301	13G00301F	13G00401	13G00401
Laboratory Sample Number:	RC092010	RC092004	MD985002	MD985003	MD985002	MF004006
Date Sampled:	10-SEP-96	10-SEP-96	16-JUN-97	16-JUN-97	16-JUN-97	28-OCT-97
Groundwater Quality (mg/ℓ)						
Alkalinity as $CaCO_3$	NA	--	--	NA	--	NA
Chloride	NA	--	7.6	NA	5.1	NA
Hardness as $CaCO_3$	NA	--	--	NA	--	NA
Nitrate-Nitrite	NA	--	3.75	NA	2.39	NA
Sulfate	NA	4.96	--	NA	--	NA
Total dissolved solids	NA	24	58	NA	50	NA
Total organic carbon	NA	--	2.3	NA	--	NA

Notes: B = duplicate.
μg/ℓ = micrograms per liter.
-- = concentration of analyte, if present, was less than detection limit.
J = estimated value.
mg/ℓ = milligrams per kilogram.
$CACO_3$ = calcium carbonate.
NA = not analyzed.



LEGEND

WHF-13-3	Monitoring well location and designation
WHF-13-CPT-2	BAT sample location and designation
BAT	Bengt-Arne-Torstensson
	Approximate site location
NAS	Naval Air Station
TCE	Trichloroethene
Fe	Iron
Mn	Manganese
J	Duplicate
ND	Not detected
FDEP	Florida Department of Environmental Protection

FDEP Cleanup Target Levels
(in micrograms per liter)

Trichloroethene	7
Iron	200
Manganese	50

NOTES:
1. Only compounds with detections above FDEP Cleanup Target Levels are shown.
2. Bold indicates concentration exceeded a cleanup target level.

FIGURE 5-8
GROUNDWATER ANALYTICAL RESULTS

REMEDIAL INVESTIGATION REPORT
SITE 13, SANITARY LANDFILL

NAS WHITING FIELD
MILTON, FLORIDA

K:\02534\02534-09\RIV\02534685.DWG, VC-BB 07/21/99 16:34:27, ACAD14

00245D07Z

Field Parameters. Representative measurements of the field parameters obtained during the purging of the monitoring wells are presented in Table 5-12. The pH values for groundwater samples collected at Site 13 ranged from 4.60 to 6.00 SUs. The pH values were below the lower limit for the Florida secondary drinking water requirement of 6.5 SUs; however, they were within the range of values measured in background groundwater samples collected for NAS Whiting Field.

Temperature measurements ranged from 16.0 to 25.5 degrees Celsius, and the specific conductance ranged from 26 to 255 micromhos per centimeter. Turbidity measurements for the Phase IIA groundwater samples (collected in 1993) ranged from 6.57 to 19.3 NTUs. Turbidity measurements for Phase IIB groundwater samples (collected in 1996 and 1997), collected using low-flow sampling methods, ranged from 0.80 to 18.4 NTUs. Two Phase IIB groundwater samples collected from monitoring wells WHF-13-1 and WHF-13-3S had turbidity measurements above the Florida public water supply treatment technique criterion of 5 NTUs.

Phase IIA Sampling Event. During Phase IIA of the RI, three groundwater samples were collected from existing monitoring wells (WHF-13-1S, WHF-13-1, and WHF-13-2) on November 2, 1993. Monitoring wells WHF-13-1S and WHF-13-2S are screened in the water table aquifer (approximate depth of 60 feet bls) and monitoring well WHF-13-1 is screened in the intermediate sand and gravel aquifer at an approximate depth of 120 feet bls. Table 5-13 presents the analytical results for groundwater samples WHF-13-1, WHF-13-1B (from monitoring well WHF-13-1S), and WHF-13-2, collected at Site 13 during Phase IIA.

VOCs, if present, were not detected at concentrations exceeding the IDL in the groundwater samples collected from monitoring wells WHF-13-1S and WHF-13-1. One VOC, acetone, was detected at an estimated concentration of 70 $\mu g/\ell$ in the sample from monitoring well WHF-13-2S. Acetone is a commonly recognized field- or laboratory-derived contaminant according to USEPA's *Contract Laboratory Program Functional Guidelines for Organic Data Review* (USEPA, 1994a).

One SVOC, BEHP, was detected in the groundwater sample from shallow monitoring well WHF-13-2. The detected concentration (10 $\mu g/\ell$) exceeded the Federal and State primary MCL of 6 $\mu g/\ell$. BEHP is a commonly recognized field- or laboratory-derived contaminant according to USEPA's *Contract Laboratory Program Functional Guidelines for Organic Data Review* (USEPA, 1994a).

Pesticide and PCB compounds were not detected in groundwater samples from Site 13.

Fifteen inorganic analytes were detected in the Phase IIA groundwater samples from Site 13. Eleven analytes exceeded their respective background screening criteria. Four analytes, aluminum, cadmium, iron, and manganese, were detected at concentrations exceeding the Federal and State primary or secondary MCLs. The Federal and State MCLs for aluminum, cadmium, iron, and manganese are 200 $\mu g/\ell$ (secondary standard), 5 $\mu g/\ell$ (primary standard), 300 $\mu g/\ell$ (secondary standard), and 50 $\mu g/\ell$ (secondary standard), respectively.

Phase IIB Sampling Event. Table 5-14 provides basic statistical parameters of detected analyte concentrations in Site 13 Phase IIB groundwater samples including the frequencies of detection, ranges of detection, mean values, and screening values. The ranges of analyte concentrations in Site 13 Phase IIB groundwater samples were compared in Table 5-13 to Federal and State ARARs including Federal primary MCLs and the Florida groundwater cleanup target levels. Because the results of the Phase IIA groundwater sampling event are not considered to be representative of the groundwater conditions at the site due to sample turbidity, they are not included in Table 5-14.

Volatile Organic Compounds. Five VOCs (1,1-dichloroethane, 1,2-dichloroethene, carbon disulfide, tetrachloroethene, and trichloroethene) were detected in groundwater samples collected from monitoring wells at Site 13. Trichloroethene was detected in one groundwater sample at a concentration exceeding the Federal MCL of 5 $\mu g/\ell$ and Florida groundwater cleanup target level of 3 $\mu g/\ell$.

Currently, no Federal or State MCLs exist for the carbon disulfide. However, the State of Florida has established a groundwater guidance concentration (700 $\mu g/\ell$) under Chapter 62-520.400(1), FAC, for carbon disulfide. The detected concentration did not exceed the groundwater guidance concentration. Carbon disulfide is a commonly recognized field- or laboratory-derived contaminant according to USEPA's, *Contract Laboratory Program Functional Guidelines for Organic Data Review* (USEPA, 1994a).

Semivolatile Organic Compounds. No SVOCs were detected in Phase IIB groundwater samples collected from monitoring wells at Site 13.

Pesticides and PCBs. No pesticide or PCB compounds were detected in any Phase IIB groundwater samples collected from Site 13 monitoring wells.

Inorganic Analytes. Fourteen inorganic analytes were detected in groundwater samples collected from Site 13 monitoring wells. Nine analytes (arsenic, barium, calcium, iron, lead, magnesium, manganese, sodium, and zinc) were detected at concentrations exceeding their respective background screening values in groundwater samples collected from monitoring wells at Site 13. Three analytes (aluminum, iron, and manganese) were detected at concentrations exceeding their respective Federal MCLs and State groundwater cleanup target levels. Table 5-13 also presents the groundwater quality parameters measured in the groundwater samples collected during Phase IIB of the RI. These parameters were within the range of values expected for the sand and gravel aquifer (Florida Geological Survey, 1992).

Filtered Groundwater Samples. Two filtered samples for TAL inorganics (metals only) were collected from monitoring wells WHF-13-1D and WHF-13-3S due to sample turbidity during the Phase IIB RI. Table 5-13 summarizes the analytes detected in the filtered sample (sample identifiers 13G00103F and 13G00301F). Comparison of the analytical results between the filtered sample and the corresponding unfiltered sample indicates a similar number of analytes are detected in the filtered sample, indicating the unfiltered groundwater samples are generally representative of the conditions at the site.

Table 5-14
Comparison of Analytes Detected in Groundwater Samples to Background Screening and Benchmark Concentrations

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Range of Detection Limits	Range of Detected Analyte Concentration[2]	Background Screening Values[3]	Federal MCLs[4]	Florida Groundwater Cleanup Target Levels (Primary MCL values indicated)[5]
TCL Volatile Organic Compounds (µg/ℓ)						
1,1-Dichloroethane	1/6	10 to 10	9	ND	NA	700
1,2-Dichloroethene (total)	2/6	10 to 10	2.5* to 5	ND	[6]70	[7]70
Carbon disulfide	2/6	10 to 10	1 to 3	ND	NA	700
Tetrachloroethene	1/6	10 to 10	1	ND	5	3
Trichloroethene	1/6	10 to 10	7	ND	5	3
Semivolatile Organic Compounds (µg/ℓ)						
None detected						
Pesticide and PCB Compounds (µg/ℓ)						
None detected						
Inorganic Analytes (µg/ℓ)						
Aluminum	5/6	11.1 to 200	37.9 to 409	654	[7]200	[7]200
Arsenic	1/6	0.5 to 10	1.1	ND	50	50
Barium	6/6	200 to 200	33 to 163	72.6	2,000	2,000
Calcium	6/6	5,000 to 5,000	1,810 to 44,900	3,320	NA	NA
Copper	1/6	1.1 to 25	1.2	10.8	[7]1,000	[7]1,000
Cyanide	1/6	1.8 to 10	2.8 to 2.8	7	NA	200
Iron	5/6	16.8 to 100	146 to 39,600	964	[7]300	[7]300
Lead	4/6	3 to 3	0.6 to 2.3	ND	15	15
Magnesium	6/6	5,000 to 5,000	866 to 5,890	2,430	NA	NA
Manganese	6/6	15 to 15	3.1 to 753	42.8	[7]50	[7]50

See notes at end of table.

Table 5-14 (Continued)
Comparison of Analytes Detected in Groundwater Samples to Background Screening and Benchmark Concentrations

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Detection Limits	Range of Detected Analyte Concentration[2]	Background Screening Values[3]	Federal MCLs[4]	Florida Groundwater Target Levels (Primary MCL values indicated)[5]
Potassium	3/6	316 to 5,000	717 to 1,520	1,528	NA	NA
Selenium	1/6	0.6 to 5	0.61	0.98	50	50
Sodium	6/6	5,000 to 5,000	1,780 to 8,170	4,770	[8]NA	160,000
Zinc	3/6	2.4 to 20	9 to 735	200	[7]5,000	[7]5,000

[1] Frequency of detection is the number of samples in which the analyte was detected over the total number of samples analyzed (excluding rejected values).
[2] A value indicated by an asterisk is the average of a sample and its duplicate. For duplicate samples having one nondetect, one-half of the contract-required quantification limit/contract-required detection limit is used as a surrogate concentration for the nondetect.
[3] The background screening value for organic compounds is the arithmetic mean concentration of background samples and twice the average of detected concentrations for inorganic analytes in background samples. Background data is presented in the NAS Whiting Field GIR (HLA, 1998).
[4] Federal MCLs are maximum permissible concentrations of contaminants in water that is delivered to a user by a public water system.
[5] Source: Chapter 62-777, Florida Administrative Code, June 1999.
[6] No MCL: systemic toxicant.
[7] Secondary MCL.
[8] No MCL has been determined for sodium but a reporting limit of 20,000 $\mu g/\ell$ has been established.

Notes: MCL = maximum contaminant level.
TCL = target compound list.
$\mu g/\ell$ = micrograms per liter.
ND = not detected.
NA = no applicable standard currently exists.
* = average of sample and duplicate.

The number and concentration of inorganic analytes detected in groundwater samples collected during the 1996 sampling event are generally lower than the corresponding samples collected during the 1993 sampling event. The low-flow sampling procedure resulted in less turbid groundwater samples for the Phase IIB sampling event as compared to the groundwater samples collected during Phase IIA. Because the low-flow sampling method produces less turbid samples that are more representative of the surficial aquifer than those obtained with a bailer, the preferred data set was from the Phase IIB sampling event.

6.0 HUMAN HEALTH RISK ASSESSMENT

An HHRA has been conducted as part of the RI for Site 13 at NAS Whiting Field. The purpose of the HHRA is to characterize the risks associated with the hypothetical exposures to site-related chemicals. This HHRA is conducted in accordance with the following guidance documents:

- USEPA's *Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A)* (USEPA, 1989b);
- *Guidance for Data Useability in Risk Assessment (Part A), Final* (USEPA, 1992a), and
- Region IV Risk Assessment Guidance (USEPA, 1995a).

Additionally, the HHRA will consider the following Florida Department of Environmental Protection (FDEP) guidance:

- Soil Cleanup Target Levels for Florida (FDEP, 1999)

The methodology for the HHRA is described in Chapter 2.0 of the GIR (HLA, 1998). The HHRA methodology presented in the GIR consists of the following steps:

- data evaluation,
- selection of CPCs,
- exposure assessment,
- toxicity assessment, and
- risk characterization.

Site 13 is located along the southeastern base boundary at NAS Whiting Field. The location, physical description, and history associated with Site 13 are described in Chapter 1.0 of this report. Surface soil, subsurface soil, and groundwater were collected from Site 13 during the RI. Sampling locations and the sampling rationale are presented in Chapters 3.0 and 5.0 of this report.

6.1 DATA EVALUATION. The data evaluation involves numerous activities, including sorting data by medium, evaluating sample quantitation limits (SQLs), and evaluating quality of data with respect to qualifiers.

The data for Site 13 were categorized into surface soil, subsurface soil, groundwater, and background for each medium.

SQLs are compared to USEPA Region III RBCs (USEPA, 1997a), and Florida Cleanup Target Levels (FDEP, 1999). Surface soil and subsurface soil SQLs were compared to Region III RBCs (USEPA, 1997a) and Florida Cleanup Target Levels (FDEP, 1998 and 1996) for residential and industrial, respectively. Groundwater SQLs were compared to Florida Cleanup Target Levels (FDEP, 1999) and Region III Tap Water RBCs (USEPA, 1998). Analyte-specific SQLs above RBCs and Florida screening values are identified and discussed in the uncertainty analysis.

The quality of the data was evaluated with respect to the data qualifiers. Only data of sufficient quality were retained for evaluation in the HHRA. The HHRA

considers data with "J", "U", and "UJ" qualifiers as well as data with no qualifier.

6.2 SELECTION OF HUMAN HEALTH CHEMICAL OF POTENTIAL CONCERN (HHCPCs). The HHCPCs were selected per the methodology described in Section 2.5 of the GIR (HLA, 1998). This selection of HHCPC methodology considers 1) frequency of detection, 2) consistency with background conditions, 3) a comparison with regulatory and risk-based screening values (screening values are presented in Appendix F, Tables F-1 through F-3), and 4) a comparison to essential nutrient levels.

USEPA Region IV criteria were be used in selecting HHCPCs (USEPA, 1995a). For each medium, the following criteria were employed to exclude detected analytes from the list of HHCPCs. Each criterion by itself is justification for excluding the analyte:

Less than 5 Percent Frequency of Detection. An analyte is not selected as an HHCPC if it has a frequency of detection (number of samples in which the analyte is detected divided by the number of samples analyzed for that analyte) less than 5 percent (USEPA, 1995a) and is not selected as an HHCPC in another medium. This criterion is not used if there are less than 20 environmental samples for a specific medium; therefore, it was not applicable in this HHRA.

Less than Background Screening Concentrations. If the maximum detected concentration of an analyte is less than twice the arithmetic mean of the background concentration (inorganics only), the analyte is not selected as an HHCPC (USEPA, 1995a). Development of background screening values for surface soil, groundwater, and subsurface soil are discussed below.

- A representative surface soil background data set consisting of Troup and Dothan/Lucy/Bonifay soil is used for background screening of Site 13 surface soil samples. Sample locations are identified on Figure 3-10 and are discussed in Subsection 3.3.1 of the GIR (HLA, 1998). The background surface soil data used for screening Site 15 surface soils are presented in Tables 3-8 and 3-14 of the GIR (HLA, 1998).

- Subsurface soil locations are identified on Figure 3-11 and are discussed in Subsection 3.3.2 of the GIR (HLA, 1998). Tables 3-15 through 3-17 in the GIR present background sample data for various types of subsurface soil. Table 3-18 of the GIR (HLA, 1998) presents summary statistics and background screening data value used in the Site 13 HHRA subsurface soil evaluation.

- Background groundwater sample locations are identified on Figure 3-12 and discussed in Subsection 3.3.3 of the GIR (HLA, 1998). Table 3-21 through 3-23 of the GIR (HLA, 1998) presents background screening data for groundwater. Table 3-24 of the GIR (HLA, 1998) presents the summary statistics used for screening the groundwater at Site 13.

Less than Risk-Based Screening Concentrations, Standards, and Guidelines. If the maximum detected concentration of the analyte in a medium is less than its corresponding adjusted USEPA Region III RBC (USEPA, 1998), and less than FDEP standards, the analyte is not selected as an HHCPC (USEPA, 1995a). The target hazard quotient (HQ) in the USEPA Region III RBC table is 1 and the target cancer risk is 1×10^{-6}. All RBCs based on noncarcinogenic effects are adjusted for a target HQ of 0.1 per Region IV guidance (USEPA, 1995a).

The residential soil RBCs are used for screening surface soil. The industrial soil RBCs are used for screening subsurface soil. No RBC is available for lead in soil due to a lack of toxicity data. Based on a USEPA recommendation, a screening level of 400 milligrams per kilogram (mg/kg) for lead under residential land use is used as the RBC for lead in soil (USEPA, 1994c). The maximum detected concentrations of analytes in surface soil and subsurface soil are also compared to residential and industrial Florida Soil Cleanup Target Levels (FDEP, 1999), respectively.

Tap water RBCs (USEPA, 1998), Federal MCLs (USEPA, 1996b) and Florida Cleanup Target Levels (FDEP, 1999) are used for screening HHCPCs in groundwater.

Less than Essential Nutrient Screening Values. If the maximum detected concentration of an essential nutrient (i.e., sodium, potassium, magnesium, and calcium) in a medium is below a toxic level and consistent with or only slightly above its background concentration, the essential nutrient is not selected as an HHCPC. The derivation of essential nutrient screening values is presented in Appendix C of the GIR.

HHCPCs were not screened using the essential nutrient value for iron; the RBC for iron was used instead. However, if iron is determined to be a risk driver, a comparison of the exposure concentrations against the essential nutrient level for iron will be presented in the uncertainty analysis section for that medium.

If the analyte meets any of the above criteria, is not a member of the same chemical class as other HHCPCs in the medium, and is not a breakdown product of other HHCPCs in the medium, then the analyte is not selected as an HHCPC. In situations where multiple screening values are available, a chemical is excluded only if its maximum screening concentration is less than all of the corresponding screening values. Appendix F of this report presents the RBCs, regulatory guidance values, and ARARs used in HHCPC selection. After applying these criteria with professional judgment, HHCPCs are identified for each medium. HHCPC selection for each medium is presented below in Subsections 6.2.1 through 6.2.3.

6.2.1 Surface Soil Ten samples (13-SL-01 through 13-SL-05, 13S00101, 13S00201, 13S00301, 13S00401, 13S00501 and one duplicate 13S00501A) were considered in the Site 13 HHRA. Samples 13-SL-01, 13-SL-02, 13-SL-03, 13-SL-04, and 13-SL-05 did not have data for both endrin aldehyde and carbazole. VOCs, SVOCs, pesticides, PCBs, and inorganic data from all of these samples are evaluated in this HHRA. Table 5-8 presents the analytes detected and the concentrations in surface soil.

Table 6-1 presents summary statistics for the detected analytes and identifies five inorganic analytes (aluminum, arsenic, iron, manganese, and vanadium) as HHCPCs for surface soil at Site 13.

6.2.2 Subsurface Soil Three samples (13SS0201, 13SS0302, and 13SS503) were collected from Site 13. VOCs, SVOCs, pesticides, PCBs and inorganics data from all of these samples are evaluated in this HHRA (Table 5-10). Table 6-2 presents summary statistics for the detected analytes and identifies one inorganic analyte (arsenic) as an HHCPC for subsurface soil at Site 13.

6.2.3 Groundwater Six groundwater samples (13G00101, 13G00102, 13G00103, 13G00201, 13G00301, and 13G00401) were collected from Site 13. Sample 13G00401 was sampled on June 16, 1997, and October 28, 1997. These two sets of data for volatiles were averaged. VOCs, SVOCs pesticides, PCBs, and inorganics data from these samples are evaluated in this HHRA (Table 5-13). Table 6-3 presents the summary statistics for the detected analytes and identifies trichloroethene and three inorganics (arsenic, iron, and manganese) as HHCPCs for groundwater at Site 13.

6.3 EXPOSURE ASSESSMENT. The exposure assessment methodology is described in Subsection 2.5.3 of the GIR (HLA, 1998). This process involves the following several steps:

- characterization of the exposure setting in terms of physical characteristics and the populations that may hypothetically be exposed to site-related chemicals;
- identification of potential exposure pathways and receptors; and
- quantification of exposure for each population in terms of the amount of chemical either ingested, inhaled, or absorbed through the skin from all complete or hypothetically complete (potential future) exposure pathways.

Summaries of hypothetical exposure pathways to chemicals detected at Site 13 are presented on Figure 6-1.

The hypothetical pathways including medium and route of exposure, the hypothetical exposed population, and the rationale for pathway selection or exclusion are presented in Table 6-4 and are described in more detail in Subsections 6.3.1 through 6.3.3. Receptor-specific exposure parameters for each exposure scenario are presented in Appendix C to the GIR (HLA, 1998). Risk calculation spreadsheets in Appendix F to this RI report also contain the assumed exposure parameters and quantitation of exposures.

6.3.1 Surface Soil No humans currently reside or work at Site 13. Currently there are no buildings present at the site; therefore, exposure of occupational workers will be only considered as part of the future land-use scenario. Therefore, only potential trespassers and site maintenance workers will be considered potential current receptors.

Site 13 may be developed eventually for residential land use; therefore, the residential receptor will be evaluated as part of the hypothetical future land-

Table 6-1
Selection of Human Health Chemicals of Potential Concern for Surface Soil

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Analyte	Frequency of Detection[1]	Reporting Limit Range	Range of Detected Concentrations[2]	Average of Detected Concentrations[3]	Background Screening Concentration[4]	Selected Screening Concentration[5]	Analyte HHCPC? (Yes/No)	Reason[6]
Volatile Organic Compounds (µg/kg)								
Methylene chloride	4/10	11 to 15	4 to 8	5	NA	16,000	No	S
Semivolatile Organic Compounds (µg/kg)								
bis(2-Ethylhexyl)phthalate	4/10	370 to 395	95 to 450	194	NA	46,000	No	S
Fluoranthene	1/10	370 to 395	51	51	NA	310,000	No	S
Pyrene	1/10	370 to 395	61	61	NA	230,000	No	S
Inorganic Analytes (mg/kg)								
Aluminum	10/10	40	9,290* to 38,300	16,040	15,334	7,800	Yes	
Arsenic	10/10	2	1.6 to 6.9	3.8	3	0.43	Yes	
Barium	10/10	40	5.9 to 26.6	11	23.8	110	No	S
Beryllium	4/10	0.06 to 1	0.06 to 0.16	0.09	0.36	16	No	B
Calcium	10/10	1,000	34.2 to 525	183	402	1,000,000	No	S
Chromium	10/10	2	6.9 to 27.9	13.9	10.8	23	No	S
Cobalt	9/10	0.34 to 10	0.48 to 1.9	0.93	3	470	No	B, S
Copper	6/10	5	4.1* to 9.2	6.7	9.4	110	No	B, S
Iron	10/10	20	5,620 to 23,500	11,400	8,588	2,300	Yes	
Lead	10/10	0.6 to 1	3.6* to 10.5	6.2	11	400	No	B, S
Magnesium	10/10	1,000	54.1* to 203	116	258	460,468	No	B, S
Manganese	10/10	3	18.7 to 407	95.4	404	160	Yes	
Mercury	10/10	0.1	0.01 to 0.05	0.03	0.12	2.3	No	B, S
Nickel	7/10	2.4 to 8	2.08* to 6.7	3.7	7.2	110	No	B, S
Potassium	1/10	132 to 1,000	150	150	177	1,000,000	No	B, S

See notes at end of table.

Table 6-1 (Continued)
Selection of Human Health Chemicals of Potential Concern for Surface Soil

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Reporting Limit Range	Range of Detected Concentration[2]	Average of Detected Concentrations[3]	Background Screening Concentration[4]	Selected Screening Concentration[5]	Analyte HHCPC? (Yes/No)	Reason[6]
Inorganic Analytes (mg/kg) (Continued)								
Selenium	1/10	0.46 to 1	0.27	0.27	0.44	39	No	B, S
Silver	5/10	2	0.39 to 1.2	0.7	0.70	39	No	S
Sodium	5/10	1,000	173 to 219*	194	388	1,000,000	No	B, S
Vanadium	10/10	10	14.5 to 62.4	30.9	21.2	15	Yes	
Zinc	5/10	4	7.8 to 16.8*	11.4	15.4	2,300	No	S

[1] Frequency of detection is the number of samples in which the analyte was detected over the total number of samples analyzed (excluding rejected values).
[2] A value indicated by an asterisk is the average of a sample and its duplicate. For duplicate samples having one nondetect, one-half of the contract-required quantification limit/contract-required detection limit is used as a surrogate concentration for the nondetect.
[3] The mean of detected concentrations is the arithmetic mean of all samples in which the analyte was detected. It does not include those samples with "R", "U", or "UJ" validation qualifiers.
[4] The background screening value is twice the average of detected concentrations for inorganic analytes in background samples.
[5] For all chemicals except the essential nutrients, the lesser of the U.S. Environmental Protection Agency (USEPA) Region III Risk-Based Concentration (RBC) value for residential soil exposure or the Florida Soil Cleanup Target Levels residential scenario (FDEP, 1999) was used for screening. For analytes that are HHCPCs in groundwater, the Florida Soil Cleanup Target Levels based on leachability are used for screening. Values from the USEPA Region III RBC Tables, dated October 1, 1998, are based on an excess lifetime cancer risk of 1×10^{-6} or an adjusted hazard quotient of 0.1 (USEPA, 1997a). For the essential nutrients, screening values were derived based on recommended daily allowances. Lead value is from the Revised Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites (OSWER Directive 9355.4-12) (USEPA, 1994c). Values are presented in Appendix F of this RI report.
[6] Analyte was included or excluded from the risk assessment for the following reasons:
B = the maximum detected concentration did not exceed the background screening concentration; therefore, the analyte will not be considered further.
S = the maximum detected concentration did not exceed the screening concentration; therefore, the analyte will not be considered further.

Notes: Samples: 13-SL-01 through 13-SL-05 and 13S00101 through 13S00501.
Duplicate sample: 13-SL-05A.
Background samples: BKG-SL-02, BKG-SL-06, BKG-SL-07, BKG-SL-08, BKS00101, BKS00201, BKS00301, BKS00401, and BKS00501.
Background duplicate sample: BKS00201D.

HHCPC = human health chemical of potential concern.
μg/kg = micrograms per kilogram.
NA = not applicable.
mg/kg = milligrams per kilogram.
* = average of sample and its duplicate.

Table 6-2
Selection of Human Health Chemicals of Potential Concern for Subsurface Soil Associated with Site 13

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Reporting Limit Range	Range of Detected Concentrations[2]	Mean of Detected Concentrations[3]	Background Screening Concentration[4]	Selected Screening Concentration[5]	Analyte HHCPC? (Yes/No)	Reason[6]
Volatile Organic Compounds (µg/kg)								
Acetone	3/3	11 to 435	67 to 640*	264	ND	5,500,000	No	S
2-Butanone	1/3	11 to 43.5	270*	270	ND	21,000,000	No	S
2-Hexanone	2/3	11 to 43.5	3 to 23.5*	13.3	ND	34,000	No	S
4-Methyl-2-pentanone	1/3	11 to 43.5	30.5*	30.5	ND	1,500,000	No	S
Carbon disulfide	1/3	11 to 43.5	2	2	ND	1,400,000	No	S
Toluene	1/3	11 to 43.5	19*	19	ND	2,600,000	No	S
Xylenes (total)	3/3	11 to 435	2 to 20*	8	ND	40,000,000	No	S
Semivolatile Organic Compounds (µg/kg)								
4-Methylphenol	2/3	380 to 430	68 to 1,095*	582	ND	1,000,000	No	S
Diethylphthalate	1/3	380 to 430	119.5*	120	ND	160,000,000	No	S
Naphthalene	1/3	380 to 430	325*	325	ND	270,000	No	S
Phenol	1/3	380 to 430	130*	130	ND	120,000,000	No	S
bis(2-Ethylhexyl)phthalate	1/3	390 to 430	307.5*	308	ND	280,000	No	S
Inorganic Analytes (mg/kg)								
Aluminum	3/3	40 to 40	10,700 to 23,900	15,900	27,800	100,000	No	B, S
Antimony	1/3	2.8 to 7.45	2.58*	2.6	4.4	82	No	B, S
Arsenic	3/3	2 to 2	3.75* to 6.5	5	6.2	3.7	Yes	
Barium	3/3	40 to 40	6.3 to 7.5	7	15.8	14,000	No	B, S

See notes at end of table

Table 6-2 (Continued)
Selection of Human Health Chemicals of Potential Concern for Subsurface Soil Associated with Site 13

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Reporting Limit Range	Range of Detected Concentrations[2]	Mean of Detected Concentrations[3]	Background Screening Concentration[4]	Selected Screening Concentration[5]	Analyte HHCPC? (Yes/No)	Reason[6]
Inorganic Analytes (mg/kg) (Continued)								
Beryllium	3/3	1 to 1	0.16 to 0.2	0.18	0.26	410	No	B, S
Calcium	3/3	1,000 to 1,000	130 to 193*	158	444	1,000,000	No	B, S
Chromium	3/3	2 to 2	15.9 to 21	17.9	22.8	420	No	B, S
Cobalt	3/3	10 to 10	0.75 to 1.4	1	1.5	610	No	B, S
Copper	3/3	5 to 5	3.9 to 5.8	5	8.8	8,200	No	B, S
Cyanide	1/3	0.1 to 0.55	0.085*	0.09	ND	4,100	No	S
Iron	3/3	20 to 20	13,500 to 16,200	14,500	18,100	61,000	No	B, S
Lead	3/3	1 to 1	5.1* to 6	5.6	8.4	400	No	B, S
Magnesium	3/3	1,000 to 1,000	73.2 to 97.7	81.6	272	460,468	No	B, S
Manganese	3/3	3 to 3	18.8* to 41.6	27.4	42.6	4,100	No	B, S
Mercury	3/3	0.1 to 0.1	0.16 to 2.14*	0.83	ND	8.7	No	S
Nickel	1/3	1.2 to 8	2.1	2.1	5	4,100	No	B, S
Potassium	1/3	154 to 570	125*	125	181	1,000,000	No	B, S
Silver	3/3	2 to 2	0.5 to 0.57*	0.53	1.12	1,000	No	B, S
Sodium	3/3	1,000 to 1,000	200.5* to 211	206	ND	1,000,000	No	S
Vanadium	3/3	10 to 10	37.5* to 44.6	40.1	45	1,400	No	B, S
Zinc	3/3	4 to 4	6 to 10.2	7.8	15.6	61,000	No	B, S

See notes at end of table.

Table 6-2 (Continued)
Selection of Human Health Chemicals of Potential Concern for Subsurface Soil Associated with Site 13

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

[1] Frequency of detection is the number of samples in which the analyte was detected over the total number of samples analyzed (excluding rejected values).
[2] A value indicated by an asterisk is the average of a sample and its duplicate. For duplicate samples having one nondetect, one-half of the contract-required quantification limit/contract-required detection limit is used as a surrogate concentration for the nondetect.
[3] The mean of detected concentrations is the arithmetic mean of all samples in which the analyte was detected. It does not include those samples with "R", "U", or "UJ" validation qualifiers.
[4] The background screening value is twice the average of detected concentrations for inorganic analytes in background samples.
[5] For all chemicals except the essential nutrients (calcium, magnesium, potassium, and sodium), lesser of the U.S. Environmental Protection Agency (USEPA) Region III Risk-Based Concentration (RBC) table for industrial soil exposure per January 1993 guidance (*Selecting Exposure Routes and Contaminants of Concern by Risk-Based Screening*, EPA/903/R-93-001) or Florida Soil Target Levels industrial scenario (FDEP, 1999) was used for screening. For analytes that are HHCPCs in groundwater, the Florida soil target levels based on leachability are used for screening. There were four HHCPCs selected in groundwater at Site 13; however, trichloroethene was not detected in subsurface soil at Site 13 and no Florida soil target levels are available for iron, or manganese. Actual values are taken from the USEPA Region III RBC Tables dated October 1, 1998, and are based on an excess lifetime cancer risk of 1×10^{-6} or an adjusted hazard quotient of 0.1 (USEPA, 1997a). For the essential nutrients, screening values were derived based on recommended daily allowances. Lead value is from the Revised Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites (OSWER Directive 9355.4-12) (USEPA, 1994c). Values are presented in Appendix F of this RI report.
[6] Analyte was included or excluded from the risk assessment for the following reasons:
B = the maximum detected concentration did not exceed the background; therefore, the analyte will not be considered further.
S = the maximum detected concentration did not exceed the screening concentration; therefore, the analyte will not be considered further.

Notes: The average of a sample and its duplicate is used for all table calculations.
Samples: 13SS0201, 13SS0302, and 13SS0503.
Duplicate samples: 13SS0503A.

Background samples: BKB00101, BKB00102, BKB00201, BKB00202, BKB00301, BKB00302, BKB00401, BKB00402, BKB00501, BKB00502, BKB00601, BKB00602, BKB00701, and BKB00702.
Background duplicate samples: BKB00401D, and BKB00602D.

HHCPC = human health chemical of potential concern.
µg/kg = micrograms per kilogram.
* = average of sample and its duplicate.
ND = not detected in any background sample.
mg/kg = milligrams per kilogram.

Table 6-3
Selection of Human Health Chemicals of Potential Concern for Unfiltered Groundwater

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Reporting Limit Range	Range of Detected Concentrations[2]	Mean of Detected Concentrations[3]	Background Screening Concentration[4]	Selected Screening Concentration[5]	Analyte HHCPC? (Yes/No)	Reason[6]
Volatile Organic Compounds (µg/ℓ)								
1,1-Dichloroethane	1/6	10	9	9	ND	80	No	S
1,2-Dichloroethene (total)	2/6	10	2.5* to 5	3.8	ND	5.5	No	S
Carbon disulfide	2/6	10	1 to 3	2	ND	100	No	S
Tetrachloroethene	1/6	10	1	1	ND	1.1	No	S
Trichloroethene	1/6	10	7	7	ND	1.6	Yes	
Inorganic Analytes (µg/ℓ)								
Aluminum	5/6	11.1 to 200	37.9 to 409	163	654	50	No	B
Arsenic	1/6	0.5 to 10	1.1	1.1	ND	0.045	Yes	
Barium	6/6	200 to 200	33 to 163	85.6	72.6	260	No	S
Calcium	6/6	5,000 to 5,000	1,810 to 44,900	14,400	3,320	1,055,398	No	S
Copper	1/6	1.1 to 25	1.2	1.2	10.8	150	No	B, S
Cyanide	1/6	1.8 to 10	2.8	2.8	7	73	No	B, S
Iron	5/6	16.8 to 100	146 to 39,600	8,650	964	300	Yes	
Lead	4/6	3	0.6 to 2.3	1.4	ND	15	No	S
Magnesium	6/6	5,000 to 5,000	866 to 5,890	3,390	2,430	118,807	No	S
Manganese	6/6	15 to 15	3.1 to 753	147	42.8	50	Yes	
Potassium	3/6	316 to 5,000	717 to 1,520	1,180	1,530	297,016	No	B, S

See notes at end of table

Table 6-3 (Continued)
Selection of Human Health Chemicals of Potential Concern for Unfiltered Groundwater

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Reporting Limit Range	Range of Detected Concentrations[2]	Mean of Detected Concentrations[3]	Background Screening Concentration[4]	Selected Screening Concentration[5]	Analyte HHCPC? (Yes/No)	Reason[6]
Inorganic Analytes (μg/ℓ) (Continued)								
Selenium	1/6	0.6 to 5	0.61	0.61	0.98	18	No	B, S
Sodium	6/6	5,000 to 5,000	1,780 to 8,170	3,860	4,770	160,000	No	S
Zinc	3/6	2.4 to 20	9 to 735	322	200	1,100	No	S

[1] Frequency of detection is the number of samples in which the analyte was detected over the total number of samples analyzed (excluding rejected values).
[2] A value indicated by an asterisk is the average of a sample and its duplicate. For duplicate samples having one nondetect, one-half of the contract-required quantification limit/contract-required detection limit is used as a surrogate concentration for the nondetect.
[3] The mean of detected concentrations is the arithmetic mean of all samples in which the analyte was detected. It does not include those samples with "R", "U", or "UJ" validation qualifiers.
[4] The background screening value is twice the average of detected concentrations for inorganic analytes in background samples.
[5] For all chemicals except the essential nutrients, the lesser of the U.S. Environmental Protection Agency (USEPA), Region III Risk-Based Concentration (RBC) table for tap water exposure or the Florida Groundwater Cleanup Target Levels (Florida Department of Environmental Protection, 1999) was used for screening. Actual values are taken from the USEPA Region III RBC Tables dated October 1, 1998, and are based on an excess lifetime cancer risk of 1×10^{-6} or an adjusted hazard quotient of 0.1 (USEPA, 1997a). For the essential nutrients, screening values were derived based on recommended daily allowances. Values are presented in Appendix C of the General Information Report.
[6] Analyte was included or excluded from the risk assessment for the following reasons:
B = the maximum detected concentration did not exceed the background screening concentration; therefore, the analyte will not be considered further.
S = the maximum detected concentration did not exceed the screening concentration; therefore, the analyte will not be considered further.

Notes: Samples: 13G00101, 13G00102, 13G00103, 13G00201, 13G00301 and 13G00401.
Background samples: BKG00101 through BKG00103, BKG00201 through BKG00203, and BKG00301.
Background duplicate sample: BKG00101D.

HHCPC = human health chemical of potential concern.
μg/ℓ = micrograms per liter.
* = average of sample and its duplicate.
ND = not detected in any background samples.

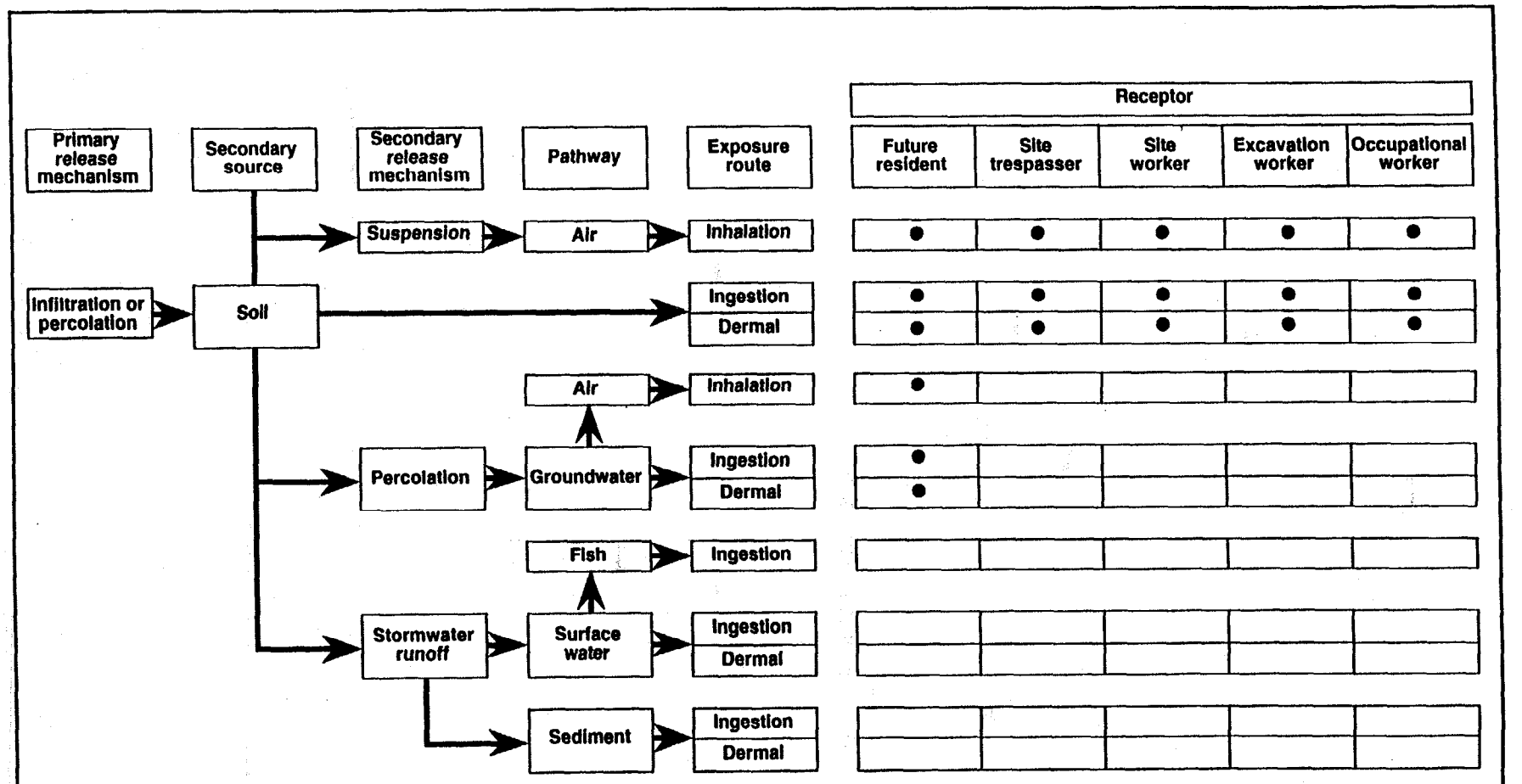


FIGURE 6-1
SITE 13, COMPLETE EXPOSURE PATHWAYS
FOR HUMAN RECEPTORS

REMEDIAL INVESTIGATION REPORT
SITE 13, SANITARY LANDFILL

NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA

2534-09 SITE13 FIG 6-1 FINAL 042398 has

Table 6-4
Summary of Potential Exposure Pathways

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Medium of Exposure	Route of Exposure	Potentially Exposed Population	Selected for Evaluation ?	Reason for Selection or Evaluation
Current Land Use				
Surface Soil	Dermal contact with soil, ingestion of soil, and inhalation of fugitive dust.	Resident (adult and child) Trespasser (adult and adolescent) Occupational worker (adult) Site maintenance worker (adult) Excavation worker (adult)	No Yes No Yes No	No humans currently reside or work at Site 13. Adolescents and adults may be exposed to contaminants in the surface soil while trespassing. The site maintenance workers may be exposed to contaminants in surface soil while performing routine site activities.
Subsurface Soil	Dermal contact with soil, ingestion of soil, and inhalation of fugitive dust.	Excavation worker	No	There are no excavation activities currently at Site 13.
Groundwater	Ingestion of groundwater as drinking water	Resident (adult)	No	There are no current exposures to groundwater.
Future Land Use				
Surface soil	Dermal contact with soil, ingestion of soil, and inhalation of fugitive dust.	Resident (child and adult) Trespasser (adolescent and adult) Occupational worker (adult) Site maintenance worker (adult) Excavation worker (adult)	Yes Yes Yes Yes Yes	If Site 13 is developed for residential use, residents could be exposed to chemicals in surface soil. Exposure of trespassers, occupational worker, site maintenance worker and excavation worker to chemicals in surface soil is also possible if the site is developed in the future.
Subsurface Soil	Dermal contact with soil, ingestion of soil, and inhalation of fugitive dust.	Excavation worker	Yes	An excavation worker could be exposed to subsurface soil during utility work or construction activities.
Groundwater	Ingestion of groundwater as drinking water and inhalation of volatiles while showering	Resident (adult and child)	Yes	If Site 13 is developed for residential use, drinking water wells in the surficial aquifer could be influenced by contaminants in the groundwater associated with Site 13. Therefore, future residents could be exposed to contaminants in the surficial aquifer.

use scenario. Other possible future exposure scenarios include excavation activities, such as installation of utility lines, and site maintenance, such as mowing the grass. Exposures of hypothetical future residents (adult and child), hypothetical future occupational workers, current and future site maintenance workers, future excavation workers, and current and future trespassers (adult and child) to surface soil contaminants through ingestion, dermal contact, and inhalation of particulates are evaluated in this HHRA.

6.3.2 Subsurface Soil There are no current exposures to subsurface soil because no excavation or construction activities are ongoing at Site 13. However, if Site 13 is developed for residential or industrial use or if excavation activities occur in the future, an excavation worker could be exposed to contaminants in subsurface soil. Therefore, future exposure of excavation or construction workers to contaminants in subsurface soil (incidental ingestion, dermal contact, and inhalation of fugitive dust) was evaluated in this HHRA.

6.3.3 Groundwater Currently, groundwater at Site 13 is not used for any potable or nonpotable purpose. There are no plans to use the water resource in the foreseeable future. In the event Site 13 or areas hydraulically downgradient of Site 13 are developed for residential use, the exposure pathway to chemicals in groundwater could become complete. Therefore, hypothetical future domestic use of the surficial aquifer (adult and child ingestion) has been evaluated in this HHRA as a worst-case estimate of hypothetical future receptors.

6.3.4 Exposure Point Concentrations (EPCs) EPCs for all HHCPCs in surface soil and groundwater were calculated according to Paragraph 2.5.3.3 of the GIR (HLA, 1998). The EPCs for HHCPCs in surface soil, subsurface soil, and groundwater for Site 13 are presented in Tables 6-5 through 6-7, respectively. The EPCs were used with receptor-specific exposure parameters to quantify exposures to the HHCPCs.

6.3.5 Quantification of Exposure HHCPC intakes via each exposure pathway are calculated for each of the potential exposure populations. This quantification process involves developing assumptions regarding exposure conditions and exposure scenarios for each receptor to estimate the total amount of contaminants a hypothetical receptor may ingest, dermally absorb, or inhale from each exposure pathway. The ultimate goal of this step, as defined in USEPA guidance, is to identify the combination of these exposure variables or parameters resulting in the most intense level of exposure "reasonably" expected to occur under current and future site conditions (USEPA, 1989b). Risk calculation spreadsheets and exposure assumptions are presented in Appendix F to this report.

6.4 TOXICITY ASSESSMENT. The toxicity assessment methodology is described in Subsection 2.5.4 of the GIR (HLA, 1998). The toxicity assessment evaluates the available evidence on the hypothetical adverse effects associated with exposure to each HHCPC. This information is used to develop a relationship between the extent of exposure and the likelihood or severity of adverse human health effects. Two steps are typically associated with toxicity assessment: hazard identification and dose-response assessment.

Table 6-5
Exposure Point Concentrations for Human Health Chemicals of Potential Concern for Surface Soil

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Maximum Detected Concentration	95% UCL[2]	Exposure Point Concentration[3]
Inorganic Analytes (mg/kg)				
Aluminum	10/10	38,300	22,030	22,030
Arsenic	10/10	6.9	5.2	5.2
Iron	10/10	23,500	16,200	16,200
Manganese	10/10	407	219	219
Vanadium	10/10	62.4	43.8	43.8

[1] Frequency of detection is the number of samples in which the analyte was detected over the total number of samples analyzed (excluding rejected values).
[2] 95% upper confidence limit (UCL) of the arithmetic mean is calculated using all samples. One-half the contract-required quantitation limit/contract-required detection limit is used as a surrogate for nondetects.
[3] Exposure point concentration is the lower of either the 95% UCL concentration or maximum detected concentration.

Notes: % = percent.
mg/kg = milligrams per kilogram.

Table 6-6
Exposure Point Concentrations for Human Health Chemicals of Potential Concern for Subsurface Soil

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Maximum Detected Concentration	95% UCL[2]	Exposure Point Concentration[3]
Inorganic Analytes (mg/kg)				
Arsenic	3/3	6.5	NC	6.5

[1] Frequency of detection is the number of samples in which the analyte was detected over the total number of samples analyzed (excluding rejected values).
[2] 95% upper confidence limit (UCL) (based on log-normal distribution) of the arithmetic mean is calculated using all samples. One-half the contract-required quantitation limit/contract-required detection limit is used as a surrogate for nondetects. The UCL is not calculated when there are less than 10 total samples.
[3] Exposure point concentration is the lower of either the 95% UCL concentration or maximum detected concentration.

Notes: % = percent.
mg/kg = milligrams per kilogram.
NC = not calculated.

Table 6-7
Exposure Point Concentrations for Human Health Chemicals of Potential Concern for Groundwater

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Maximum Detected Concentration	Arthimetic Mean[2]	Exposure Point Concentration[3]
Volatile Organic Compounds (μg/ℓ)				
Trichloroethene	1/6	7	5.3	7
Inorganic Analytes (μg/ℓ)				
Arsenic	1/6	1.1	2	7
Iron	5/6	39,600	7,210	7,210
Manganese	6/6	753	147	147

[1] Frequency of detection is the number of samples in which the analyte was detected over the total number of samples analyzed (excluding rejected values).
[2] Arithmetic mean of all samples calculated using one-half the contract-required quantitation limit/contract-required detection limit for nondetects.
[3] Exposure point concentration is the lower of either the mean concentration or maximum detected concentration.

Note: μg/ℓ = micrograms per liter.

- Hazard identification is the process of determining if exposure to an agent can cause a particular adverse health effect and, more importantly, if that effect will occur in humans. The objectives of the hazard identification in the HHRA are to (1) identify which of the contaminants detected at the site are hypothetical hazards, and (2) summarize their potential toxicity in brief nontechnical language.

- A dose-response assessment is conducted to characterize and quantify the relationship between intake, or dose, of an HHCPC and the likelihood of a toxic effect or response. There are categories of toxic effects evaluated in this HHRA: carcinogenic and noncarcinogenic. Following USEPA guidance for HHRAs (USEPA, 1989b), these two endpoints (cancer and noncancer) are evaluated separately. As a result of the dose-response assessment, identified toxicity values are used to estimate the incidence of adverse effects as a function of human exposure to a chemical.

Appendix F to this report contains brief toxicity profiles for HHCPCs identified in the surface soil and groundwater at Site 13. Appendix F to this report also contains dose-response information for the HHCPCs (Tables F-4 through F-9). Toxicity values used in this HHRA were current as of December 1997 for IRIS (USEPA, 1997c) and July 1997 for HEAST (USEPA, 1997b).

6.5 RISK CHARACTERIZATION. Risk characterization is the final step in the risk assessment process. This step involves the integration of the exposure and toxicity assessments into a qualitative or quantitative expression of potential human health risks associated with contaminant exposure. Quantitative estimates of both carcinogenic and noncarcinogenic risks are made for each HHCPC and each complete exposure pathway identified in the exposure assessment. The risk characterization methodology is described in Subsection 2.5.5 of the GIR (HLA, 1998).

Risk estimates for hypothetical exposures to surface soil, subsurface soil, and groundwater under current and hypothetical future land-use scenarios are discussed below in Subsections 6.5.1 and 6.5.2. These risk estimates are then compared to Federal USEPA and FDEP carcinogenic and noncarcinogenic target levels. The USEPA guidelines, established in the NCP, indicate the total excess lifetime cancer risk (ELCR) due to exposure to the HHCPCs at a site should not exceed a range of 1 in 1,000,000 (1×10^{-6}) to 1 in 10,000 (1×10^{-4}) (USEPA, 1990). FDEP has indicated chemical-specific risks greater than one in one million (1×10^{-6}) warrant further consideration.

A HQ less than 1 indicates noncarcinogenic toxic effects associated with a single chemical are not expected to occur. A cumulative hazard index (HI) greater than 1 may be indicative of possible noncarcinogenic toxic effects, but the circumstances must be evaluated on a case-by-case basis (USEPA, 1989b). As the HI increases, so does the likelihood adverse effects might be associated with exposure. Both USEPA and FDEP believe HIs greater than 1 require an evaluation of the noncarcinogenic effects.

Table 6-8 summarizes the cancer and noncancer risk under a current land-use scenario for Site 13. Table 6-9 summarizes the cancer and noncancer risk under a hypothetical future land-use scenario for Site 13.

Table 6-8
Risk Summary, Current Land Use

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Land Use	Exposure Route	HI[1]	ELCR[1]
Current Land Use			
Surface Soil			
Adult Trespasser:	Incidental ingestion	0.02	4×10^{-7}
	Dermal contact	0.03	2×10^{-8}
	Inhalation of particulates	0.00007	1×10^{-10}
	Total Adult Trespasser:	0.05	4×10^{-7}
Adolescent Trespasser:	Incidental ingestion	0.03	3×10^{-7}
	Dermal contact	0.04	1×10^{-8}
	Inhalation of particulates	0.00009	6×10^{-11}
	Total Adolescent Trespasser:	0.07	3×10^{-7}
	Total Risk to Trespasser (Adult and Adolescent) Exposed to Surface Soil:	NC	7×10^{-7}
Site Maintenance Worker:	Incidental ingestion	0.01	2×10^{-7}
	Dermal contact	0.02	2×10^{-8}
	Inhalation of particulates	0.0003	5×10^{-10}
	Total Site Maintenance Worker:	0.03	9×10^{-7}

[1] Receptor totals may vary from spreadsheets due to rounding algorithm.

Notes: HI = hazard index
ELCR = excess lifetime cancer risk
NC = not calculated because child and adult HIs are not additive.

Table 6-9
Risk Summary, Future Land Use

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Land Use		Exposure Route	HI[1]	ELCR[1]
Future Land Use				
Surface Soil				
	Adult Trespasser:	Incidental ingestion	0.02	4×10^{-7}
		Dermal contact	0.03	2×10^{-8}
		Inhalation of particulates	0.00007	1×10^{-10}
		Total Adult Trespasser:	0.05	4×10^{-7}
	Adolescent Trespasser:	Incidental ingestion	0.03	3×10^{-7}
		Dermal contact	0.04	1×10^{-8}
		Inhalation of particulates	0.00009	6×10^{-11}
		Total Adolescent Trespasser:	0.07	3×10^{-7}
		Total Risk to Trespasser (Adult and Adolescent) Exposed to Surface Soil:	NC	7×10^{-7}
	Adult Resident:	Incidental ingestion	0.1	4×10^{-6}
		Dermal contact	0.2	2×10^{-7}
		Inhalation of particulates	0.002	4×10^{-9}
		Total Adult Resident:	0.3	4×10^{-6}
	Child Resident:	Incidental ingestion	1.1	9×10^{-6}
		Dermal contact	0.4	8×10^{-8}
		Inhalation of particulates	0.01	5×10^{-9}
		Total Child Resident:	2	9×10^{-6}
		Total Risk to Resident (Adult and Child) Exposed to Surface Soil:	NC	1×10^{-5}
	Occupational Worker:	Incidental ingestion	0.05	1×10^{-6}
		Dermal contact	0.07	6×10^{-8}
		Inhalation of particulates	0.0008	1×10^{-9}
		Total Occupational Worker:	0.2	1×10^{-6}

See notes at end of table.

Table 6-9 (Continued)
Risk Summary Future Land Use

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Land Use		Exposure Route	HI[1]	ELCR[1]
Future Land Use				
	Site Maintenance Worker:	Incidental ingestion	0.01	2×10^{-7}
		Dermal contact	0.02	2×10^{-8}
		Inhalation of particulates	0.0003	5×10^{-10}
		Total Site Maintenance Worker:	0.03	2×10^{-7}
	Excavation Worker:	Incidental ingestion	0.06	6×10^{-8}
		Dermal contact	0.02	8×10^{-10}
		Inhalation of particulates	0.0003	2×10^{-11}
		Total Excavation Worker:	0.08	6×10^{-8}
Subsurface Soil:				
	Excavation Worker:	Incidental ingestion	0.01	8×10^{-8}
		Dermal contact	0.0002	9×10^{-10}
		Inhalation of particulates	ND	3×10^{-11}
		Total Excavation Worker:	0.01	8×10^{-8}
Groundwater:				
	Adult Resident:	Ingestion of groundwater as drinking water	0.9	2×10^{-5}
		Inhalation of volatiles while showering	ND	1×10^{-7}
		Total Adult Resident:	0.9	2×10^{-5}
	Child Resident:	Ingestion of groundwater as drinking water	2	9×10^{-6}
		Total Child Resident:	2	9×10^{-6}
		Total Risk to Resident (Adult and Child) Exposed to Ground Water:	NC	3×10^{-5}
		Total Risk to Resident (Adult and Child) Exposed to Groundwater and Surface Soil:	NC	4×10^{-5}

[1] Receptor totals may vary from spreadsheets due to rounding algorithm.

Notes: HI = hazard index
ELCR = excess lifetime cancer risk
NC = not calculated because child and adult HIs are not additive
ND = no dose-response data for this exposure route were available for HHCPCs in this medium.

6.5.1 Surface Soil The risk calculations for surface soil exposure are shown in Tables F-10 through F-23 in Appendix F to this report. For the current land-use scenario, the cancer risks associated with exposure to surface soil (ingestion, dermal contact, and fugitive dust inhalation) are 7×10^{-7} for an aggregate (combined adult and adolescent) trespasser, and 2×10^{-7} for a site maintenance worker. Both receptors cancer risk values are below the USEPA acceptable cancer risk range of 1 in 10,000 to 1 in 1,000,000. The noncancer risks associated with surface soil ingestion, dermal contact, and fugitive dust inhalation for all receptors under current land use are below USEPA's and FDEP's target HI of 1. Figures 6-2 and 6-3 present summaries of cancer risks and HIs, respectively, associated with exposure scenarios under potential current land-use exposure scenario.

The cancer risks associated with exposure to surface soil ingestion, dermal contact, and fugitive dust inhalation under hypothetical future land use are 1×10^{-5} for an aggregate resident (combined adult and child), 7×10^{-7} for an aggregate trespasser (combined adult and adolescent), 1×10^{-6} for an occupational worker, 2×10^{-7} for a site maintenance worker, and 6×10^{-8} for an excavation worker under hypothetical future land use. Figure 6-4 presents a summary of cancer risk associated with exposure scenarios under future land use. All of these hypothetical future receptor risks are within or below the USEPA acceptable cancer risk range; however, the hypothetical future residential risk exceeds the Florida level of concern of 1×10^{-6} (due to arsenic).

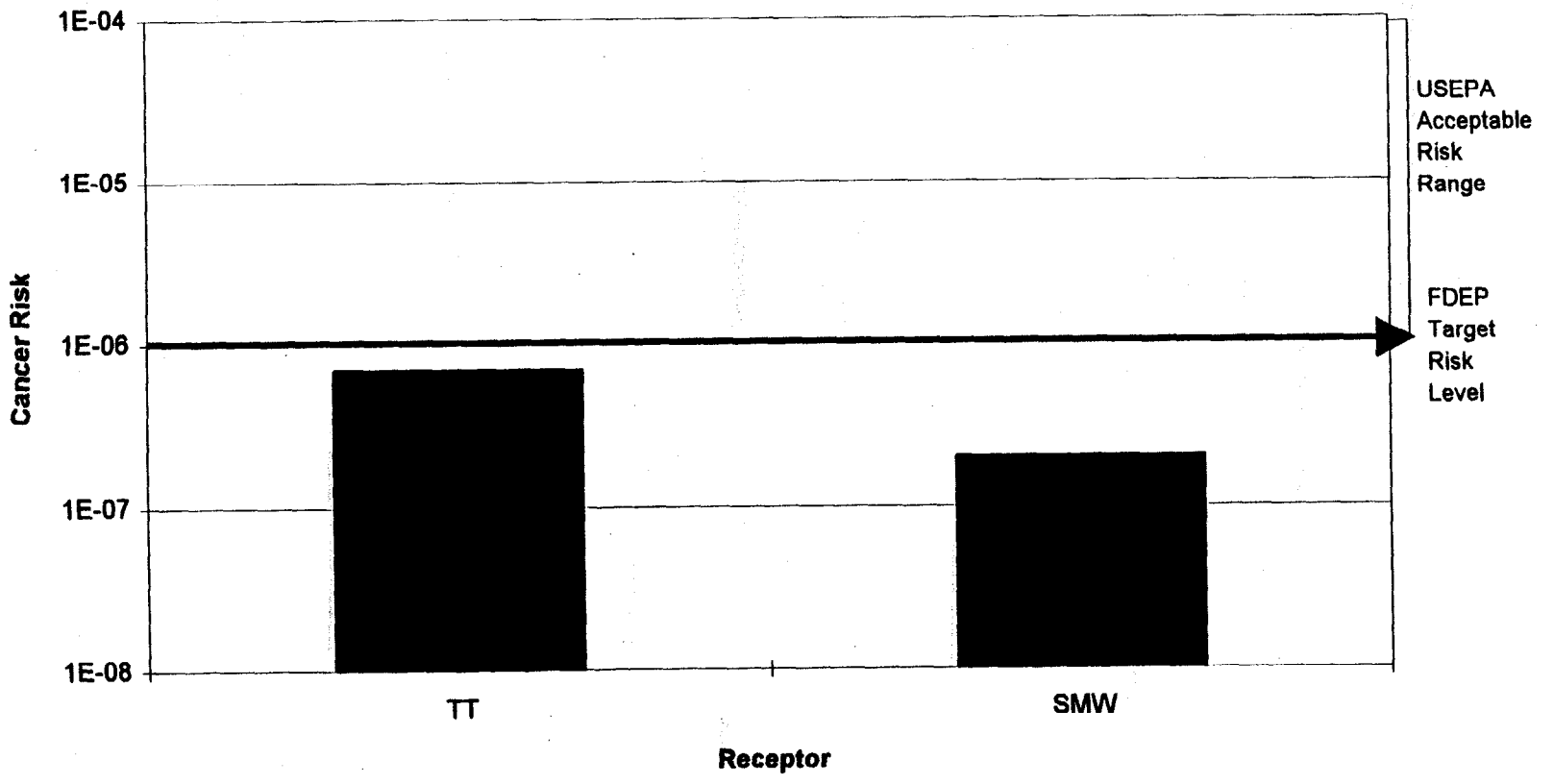
The noncancer risks associated with surface soil ingestion, dermal contact, and fugitive dust inhalation under future land use for all receptors are at or below USEPA's and FDEP's target HI of 1 with the exception of a hypothetical future child resident. Figure 6-5 presents a summary of HIs associated with exposure scenarios under future land use.

6.5.2 Subsurface Soil The risk calculations for subsurface soil exposure are shown in Tables F-24 through F-25 in Appendix F to this report. The cancer risk associated with exposure to subsurface soil ingestion, dermal contact, and fugitive dust inhalation under hypothetical future land use is 8×10^{-8} for an excavation worker. Figure 6-6 presents a summary of cancer risk associated with exposure scenarios under future land use. Hypothetical future excavation worker risk is below the USEPA and FDEP acceptable cancer risk range.

The noncancer risks associated with subsurface soil ingestion, dermal contact, and fugitive dust inhalation under future land use for a hypothetical excavation worker is below USEPA's and FDEP's target HI of 1. Figure 6-7 presents a summary of HIs associated with exposure scenarios under future land use.

6.5.3 Groundwater The risk calculations for groundwater exposure are shown in Tables F-26 through F-29 in Appendix F to this report. Currently, there are no potable supply wells at the site; thus, there is no human exposure to groundwater. Therefore, risk was not evaluated for the current land-use scenario.

The cancer risks associated with exposure to groundwater ingestion and inhalation of volatiles while showering (adult resident) under hypothetical future land use are 3×10^{-5} for an aggregate resident (combined adult and child). Figure 6-8 presents a summary of cancer risk associated with exposure scenarios under future land use. The hypothetical future residential receptor risks exceed the Florida level of concern of 1×10^{-6} (due to arsenic).



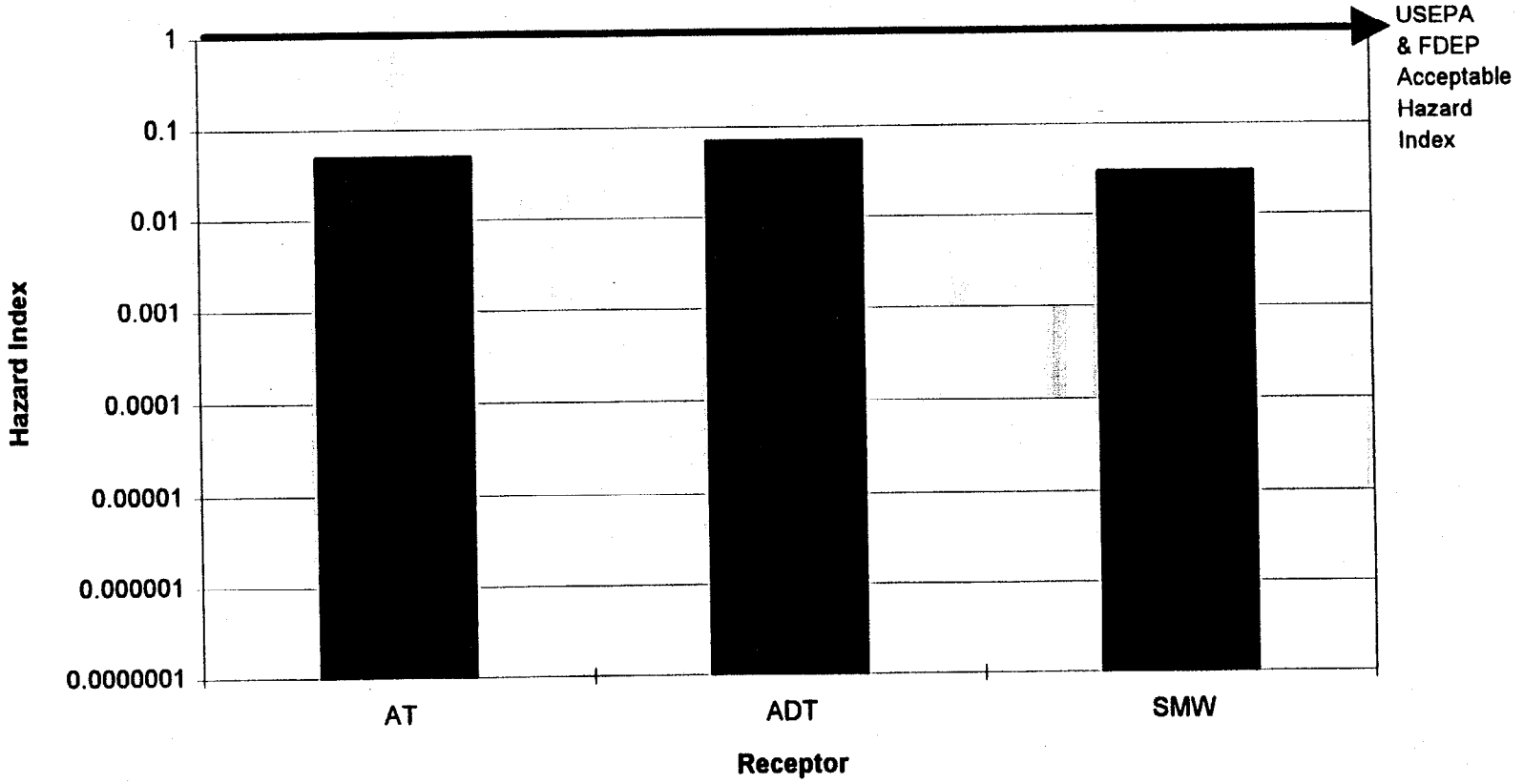
NOTES:
USEPA = U.S. Environmental Protection Agency
FDEP = Florida Department of Environmental Protection
TT = Total trespasser
SMW = Site maintenance worker

FIGURE 6-2
CANCER RISK SUMMARY
CURRENT LAND USE FOR SURFACE SOIL AT SITE 13

REMEDIAL INVESTIGATION REPORT
SITE 13, SANITARY LANDFILL

NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA

H:\HEIDI\WHITING\SITE13\FIG6-2.PM5 FIGS13B.XLS 050498HAS



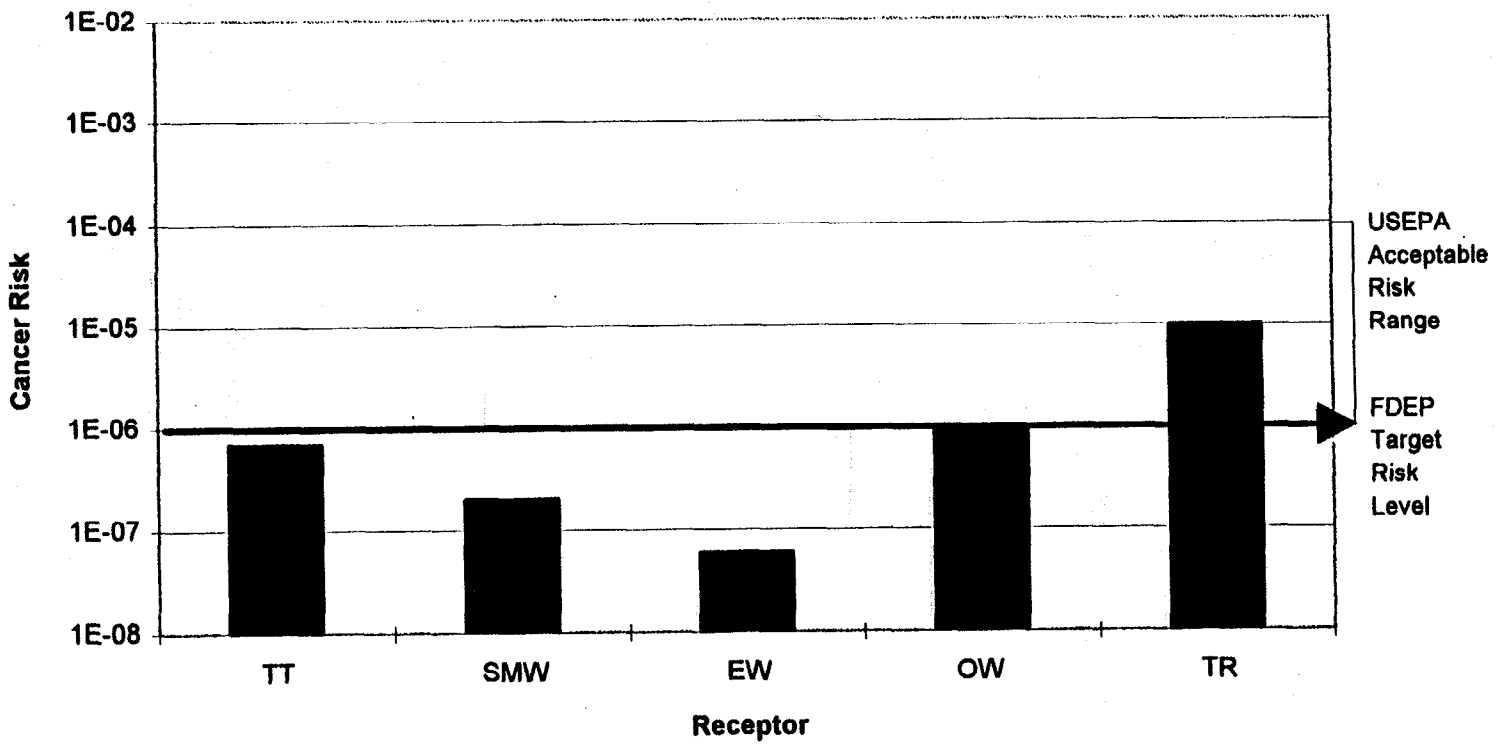
NOTES:
USEPA = U.S. Environmental Protection Agency
FDEP = Florida Department of Environmental Protection
AT = Adult trespasser
ADT = Adolescent trespasser
SMW = Site maintenance worker

FIGURE 6-3
NONCANCER RISK SUMMARY
CURRENT LAND USE FOR SURFACE
SOIL AT SITE 13

REMEDIAL INVESTIGATION REPORT
SITE 13, SANITARY LANDFILL

NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA

H:\HEIDI\WHITING\SITE13\FIG6-3.PM5 FIGS13B.XLS 050498HAS



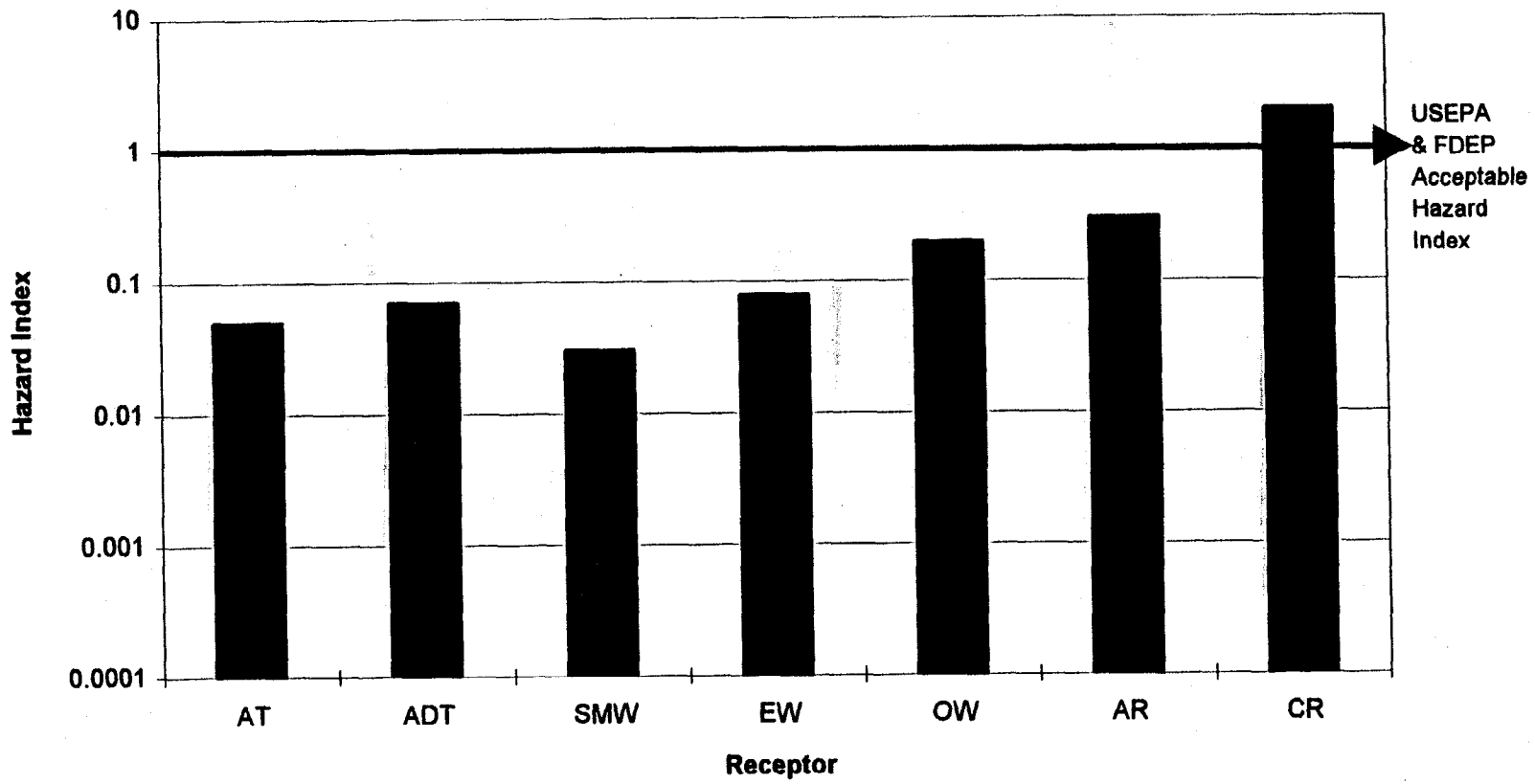
NOTES:
USEPA = U.S. Environmental Protection Agency
FDEP = Florida Department of Environmental Protection
TT = Total trespasser
SMW = Site maintenance worker
EW = Excavation worker
OW = Occupational worker
TR = Total resident

FIGURE 6-4
CANCER RISK SUMMARY
FUTURE LAND USE FOR SURFACE SOIL AT SITE 13

REMEDIAL INVESTIGATION REPORT
SITE 13, SANITARY LANDFILL

NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA

H:\HEIDI\WHITING\SITE13\FIG6-4.PM5 FIGS13B.XLS 050498HAS



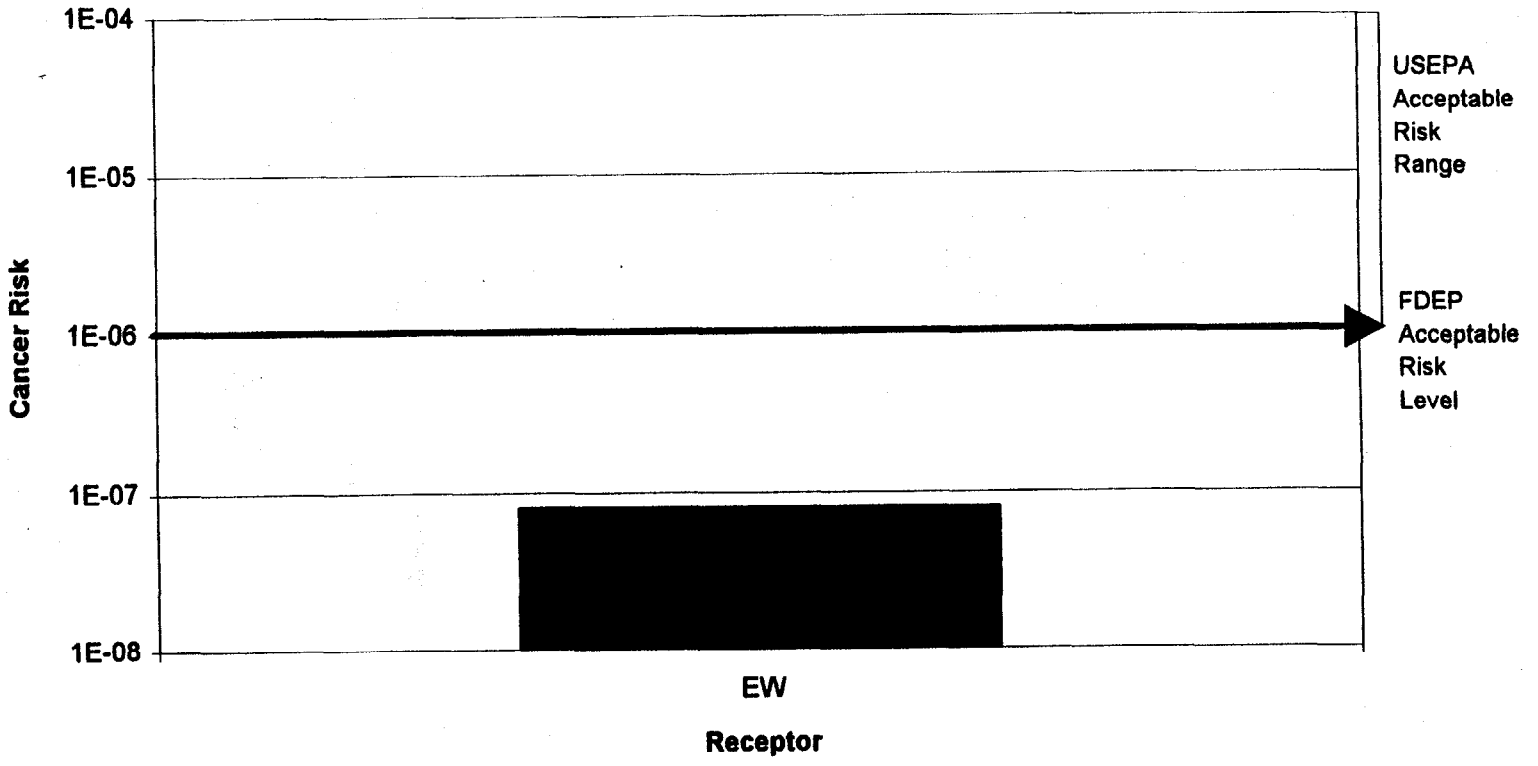
NOTES:
USEPA = U.S. Environmental Protection Agency
FDEP = Florida Department of Environmental Protection
AT = Adult trespasser
ADT = Adolescent trespasser
SMW = Site maintenance worker
EW = Excavation worker
OW = Occupational worker
AR = Adult resident
CR = Child resident

FIGURE 6-6
NONCANCER RISK SUMMARY
FUTURE LAND USE FOR SURFACE
SOIL AT SITE 13

REMEDIAL INVESTIGATION REPORT
SITE 13, SANITARY LANDFILL

NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA

H:\HEIDI\WHITING\SITE13\FIG6-5.PM5 FIGS13B.XLS 050498HAS



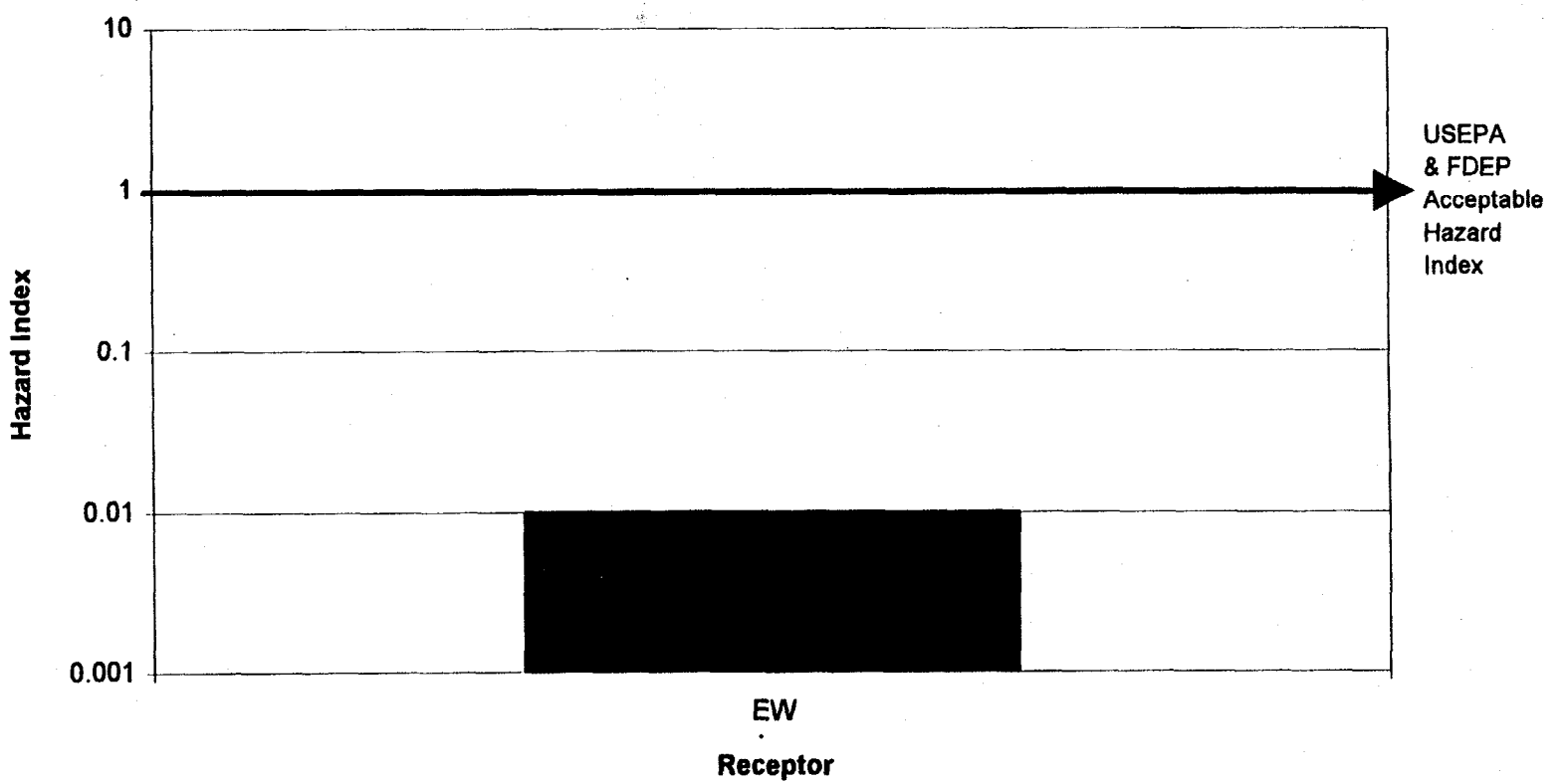
NOTES:
USEPA = U.S. Environmental Protection Agency
FDEP = Florida Department of Environmental Protection
EW = Excavation worker

FIGURE 6-6
CANCER RISK SUMMARY
FUTURE LAND USE FOR SUBSURFACE SOIL
AT SITE 13

REMEDIAL INVESTIGATION REPORT
SITE 13, SANITARY LANDFILL

NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA

H:\HEIDI\WHITING\SITE13\FIG6-6.PM5 GW13.XLS 050498HAS



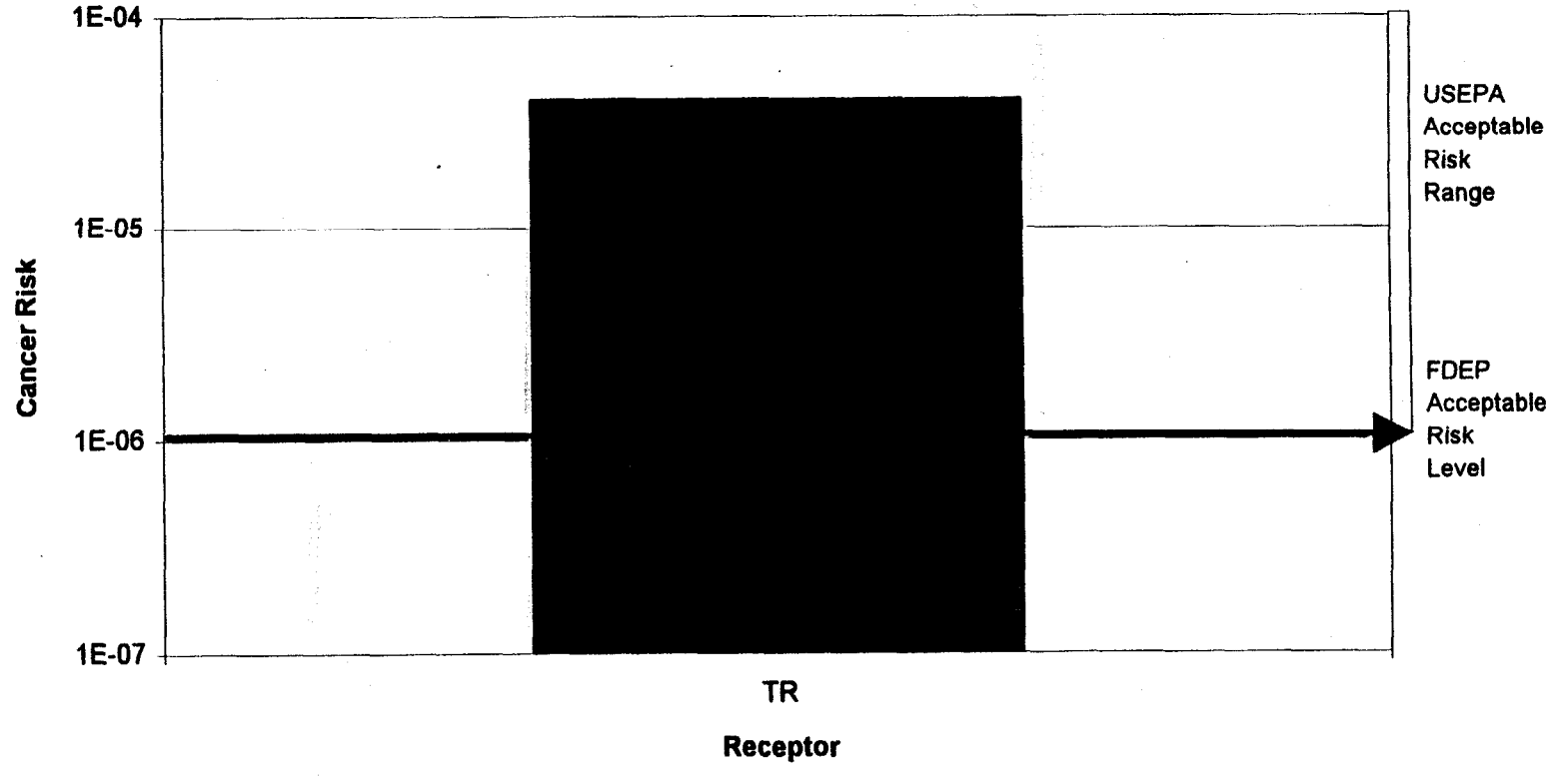
NOTES:
USEPA = U.S. Environmental Protection Agency
FDEP = Florida Department of Environmental Protection
EW = Excavation worker

FIGURE 6-7
NONCANCER RISK SUMMARY
FUTURE LAND USE FOR SUBSURFACE SOIL
AT SITE 13

REMEDIAL INVESTIGATION REPORT
SITE 13, SANITARY LANDFILL

NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA

H:\HEIDI\WHITING\SITE13\FIG6-7.PM5 GW13.XLS 050498HAS



NOTES:
USEPA = U.S. Environmental Protection Agency
FDEP = Florida Department of Environmental Protection
TR = Total resident

FIGURE 6-8
CANCER RISK SUMMARY
FUTURE LAND USE FOR GROUNDWATER
AT SITE 13

REMEDIAL INVESTIGATION REPORT
SITE 13, SANITARY LANDFILL

NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA

H:\HEIDI\WHITING\SITE13\FIG6-8.PM5 GW13.XLS 050498HAS

Under hypothetical future land use, the noncancer risks associated with groundwater ingestion for the adult resident (HI of 0.9) is below the USEPA and FDEP's target HI of 1. However the child resident (HI of 2) exceeds the USEPA's and the FDEP's target HI of 1. The major contributor to this HI is iron. Figure 6-9 presents a summary of HIs associated with exposure scenarios under future land use.

6.6 UNCERTAINTY ANALYSIS. General uncertainties associated with the collection, analysis, and evaluation of data; exposure assessment; toxicity assessment; and the risk estimation process are discussed in Paragraph 2.5.5.1 of the GIR (HLA, 1998). Important site-specific uncertainties for the interpretation of the calculated risk estimates for surface soil, subsurface soil, and groundwater at Site 13 are discussed below.

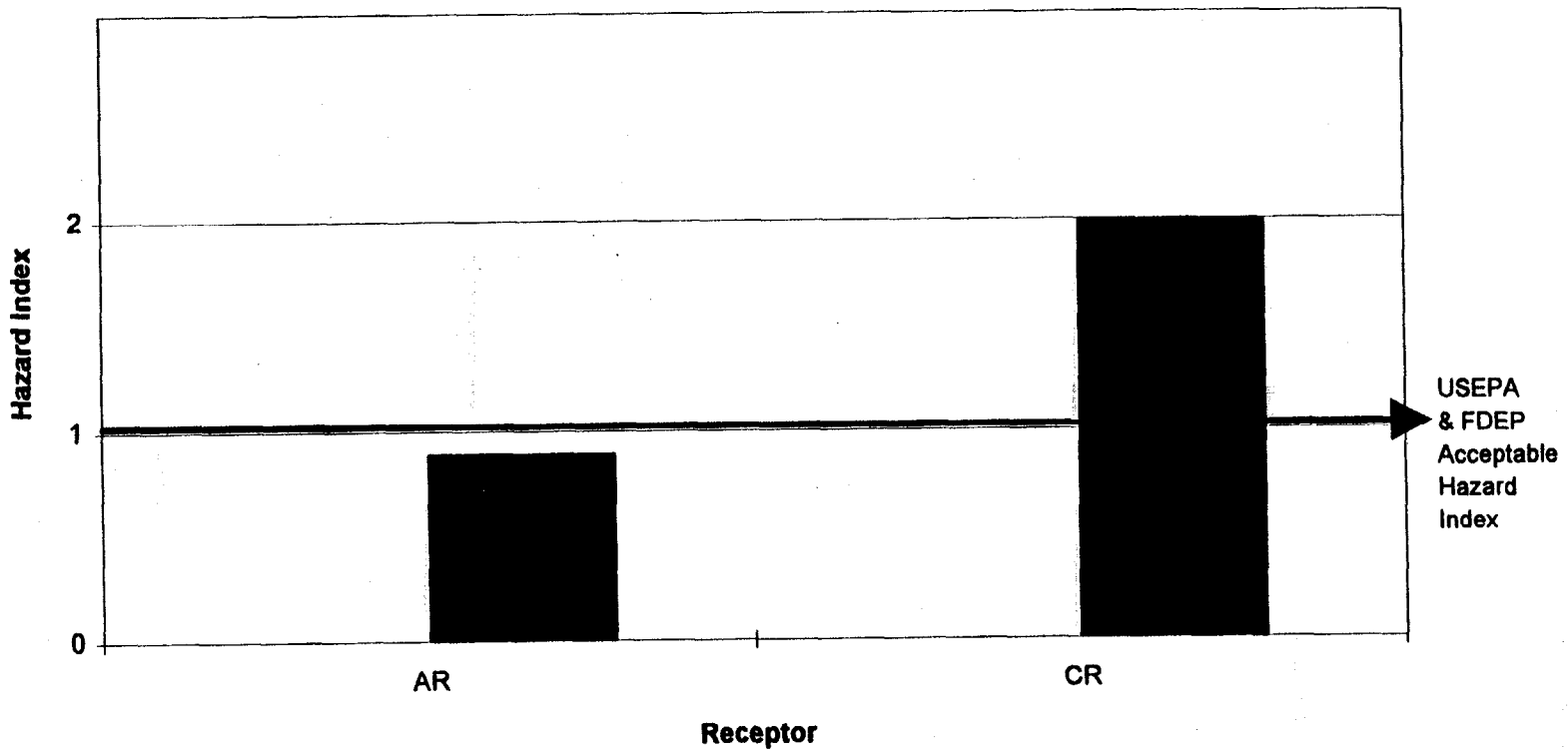
- The surface soil carcinogenic risk at Site 13 is driven by a naturally occurring metal, arsenic. It is uncertain whether or not this risk to hypothetical future residents is actually due to past site operations. Detected arsenic concentrations may actually be at naturally occurring levels or due to other anthropogenic activities such as pesticide application. This is especially noteworthy because the risk from arsenic at background conditions is 7×10^{-6}. Therefore, the risk from arsenic at Site 13 is likely to be an overestimate.

- Although the soil HI for iron is equal to 1 for the child resident, the EPC for iron in the surface soil is less than the essential nutrient screening value. Therefore, the noncancer risk from iron to the child is likely to be an overestimate.

- The lack of inhalation reference doses for most of the HHCPCs in surface soil may have resulted in underestimates of the HIs associated with exposure to surface soil and subsurface soil at Site 13; however, these noncancer risks are not likely to be significant when compared to fully characterized oral and dermal risks.

- According to the methodology described in the GIR (HLA, 1998) (Paragraph 2.5.3.3), central tendency carcinogenic risk to hypothetical future receptors that have risks exceeding Florida or USEPA levels of concern was evaluated. The central tendency evaluation is designed to provide a probable risk level (USEPA, 1995a).

  The hypothetical future resident reasonable maximum exposure (RME) carcinogenic risk exceeded its target of 1×10^{-6}. Therefore, the central tendency carcinogenic risk for future residential receptors was determined. The central tendency results and the exposure parameters are presented in Table F-30 through F-33 in Appendix F of this report. Only central tendency ingestion and dermal exposures were characterized because the contribution from inhalation was insignificant compared to the total risk. The central tendency aggregate residential risk exposed to surface soil is 2×10^{-6}. The central tendency aggregate residential risk exposed to groundwater is 5×10^{-6}. The risk ranges of 2×10^{-6} (central tendency) to 1×10^{-5} (RME) for soil and 5×10^{-6} (central tendency) to 3×10^{-5} (RME) for groundwater for hypothetical future residential receptors are useful as information to provide perspective for the risk manager and compliance with USEPA guidance (USEPA, 1995a).



NOTES:
USEPA = U.S. Environmental Protection Agency
FDEP = Florida Department of Environmental Protection
AR = Adult resident
CR = Child resident

FIGURE 6-9
NONCANCER RISK SUMMARY
FUTURE LAND USE FOR GROUNDWATER
AT SITE 13

REMEDIAL INVESTIGATION REPORT
SITE 13, SANITARY LANDFILL

NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA

H:\HEIDI\WHITING\SITE13\FIG6-9.PM5 GW13.XLS 050498HAS

6.7 REMEDIAL GOAL OPTIONS. Remedial goal option (RGO) tables are presented for each medium with a total ELCR greater than 1×10^{-6} or an HI greater than 1 per USEPA guidance, and for media with chemicals whose EPCs exceed Florida standards. The RGO concentrations are calculated using the scenario representing the highest estimated risk for a given medium. Based on the above criteria, RGOs are developed for each chemical with a total ELCR greater than 1×10^{-6} or an HQ greater than 0.1. Analytes whose EPCs exceed Florida standards are also presented in the RGO tables.

RGOs and available Federal and FDEP risk-based criteria are intended to provide the basis for the development of remedial alternatives in the FS. The RGOs are not actual or proposed cleanup levels, but are provided to assist risk-management decision making in the FS.

Table 6-10 presents the RGOs for surface soil for Site 13. RGOs are presented for arsenic based on cancer risks for the adult and child resident at Site 13.

Table 6-11 presents the RGOs for subsurface soil. Arsenic is presented not because it poses an unacceptable risk but rather it's EPC exceeds the industrial Florida soil clean up goal.

Table 6-12 presents the RGOs for groundwater. The RGO presented for arsenic and iron are based on cancer and noncancer risks, respectively, for the adult and child resident at Site 13. The value for trichloroethene is presented because its EPC exceeds the Florida groundwater cleanup target level. The EPC for arsenic is more than an order of magnitude less than the Federal drinking water standard and Florida groundwater guidance concentration.

6.8 SUMMARY OF HHRA FOR SITE 13. HHCPCs were identified and risks were estimated for surface soil, subsurface soil, and groundwater associated with Site 13. The following conclusions were drawn based on this HHRA:

- The HHCPCs detected in surface soil, subsurface soil, and groundwater do not pose unacceptable carcinogenic risks to the receptors evaluated based on evaluation of the samples using USEPA guidelines and target risk range.

- The total ELCR of 1×10^{-5} at Site 13, associated with exposure to soil by a hypothetical future resident, exceeds Florida's target risk level of concern 1×10^{-6} due to arsenic.

- The background levels of arsenic at Site 13 exceed the Florida residential soil cleanup goal and may result in an unacceptable carcinogenic risk. It is likely naturally occurring arsenic contributes to the FDEP target risk-level exceedance.

- The subsurface soils at Site 13 do not pose an unacceptable risk based on USEPA and FDEP target risk limits; however, the arsenic EPC exceeds the Florida industrial soil cleanup goal.

- The total ELCR at Site 13, associated with ingestion of groundwater by hypothetical future resident (3×10^{-5}), exceeds Florida's target risk level of concern due to arsenic. However, the EPC for arsenic is an order of magnitude less than the Federal drinking water standard and Florida groundwater guidance concentration.

Table 6-10
Summary of Remedial Goal Options for Surface Soil

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Range of Detected Concentrations	Exposure Point Concentration	Total Excess Lifetime Cancer Risk (Based on Risk to Resident [adult and child])			Total Hazard Index (Based on Risk to Child Resident)			Florida Soil Cleanup Target Level (Residential/Industrial)	Florida Soil Cleanup Target Level (Leaching)[1]	Background Screening Concentration[2]
			10^{-4}	10^{-5}	10^{-6}	3	1	0.1			
Inorganic Analytes (mg/kg)											
Arsenic	1.6 to 6.9	5.2	NR	4.2	0.42	NR	NR	2.4	[1]0.8/[3]4.62	29	3

[1] Chapter 62-777, Florida Administrative Code, June 1999.
[2] Background screening values are summarized in Table 5-7 and presented in the NAS Whiting Field General Information Report (HLA, 1998).
[3] FDEP-approved Site-Specific Soil Cleanup Goal for Covered Landfill Sites, Naval Air Station Whiting Field (see Appendix H; FDEP, 1998).

Notes: mg/kg = milligrams per kilograms.
NR = not reported because the calculated remedial goal option exceeds the exposure point concentration.

Table 6-11
Summary of Remedial Goal Options for Subsurface Soil

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Range of Detected Concentrations	Exposure Point Concentration	Total Excess Lifetime Cancer Risk (Based on Risk to Resident [adult and child])			Total Hazard Index (Based on Risk to Child Resident)			Florida Soil Cleanup Target Level (Residential)[1]	Florida Soil Cleanup Target Level (Leaching)[1]	Background Screening Concentration[2]
			10^{-4}	10^{-5}	10^{-6}	3	1	0.1			
Inorganic Analytes (mg/kg)											
Arsenic	3.75 to 6.5	6.5	NR	NR	NR	NR	NR	NR	3.7	29	6.2

[1] Chapter 62-777, Florida Administrative Code, June 1999.
[2] Background screening values are presented in the NAS Whiting Field General Information Report (HLA, 1998).

Notes: mg/kg = milligrams per kilograms.
NR = not reported because the calculated remedial goal option exceeds the exposure point concentration.

Table 6-12
Summary of Remedial Goal Options for Groundwater

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Range of Detected Concentrations	Exposure Point Concentration	Total Excess Lifetime Cancer Risk (Based on Risk to Resident [adult and child])			Total Hazard Index (Based on Risk to Child Resident)			Florida Groundwater Target Levels[1]	Federal MCL[2]	Background Screening Concentration[3]
			10^{-4}	10^{-5}	10^{-6}	3	1	0.1			
Volatile Organic Compounds (μg/ℓ)											
Trichloroethene	7	7	NA	NA	NA	NA	NA	NA	3	5	NA
Inorganic Organics (μg/ℓ)											
Arsenic	1.1	1.1	NR	0.45	0.045	NR	NR	0.48	50	50	ND
Iron	146 to 39,600	7,210	NA	NA	NA	NR	4,810	481	300	300	964
Manganese	3.1 to 753	147	NA	NA	NA	NR	NR	134	50	50	42.8

[1] Florida Department of Environmental Protection Groundwater Cleanup Target Levels, Chapter 62-777, FAC, June 1999.
[2] Federal MCLs are taken from USEPA Drinking Water Regulations and Health Advisories, October 1996.
[3] Background screening values are presented in the NAS Whiting Field General Information Report (HLA, 1998).

Notes: MCL = maximum contaminant level.
μg/ℓ = micrograms per liter.
NA = not applicable.
NR = not reported because the calculated remedial goal option exceeds the exposure point concentration.
ND = not detected in any background sample.

7.0 ECOLOGICAL RISK ASSESSMENT

The ERA evaluates potential adverse effects to ecological receptors associated with exposure to chemicals from Site 13, the Sanitary Landfill. The ERA for Site 13 follows the methodologies described in the NAS Whiting Field GIR (HLA, 1998) and current guidance materials for ERAs at Superfund sites including the following:

- *Risk Assessment Guidance for Superfund Environmental Evaluation Manual* (USEPA, 1989c)
- *Ecological Assessment of Hazardous Waste Sites: A Field and Laboratory Reference* (USEPA, 1989d)
- *Framework for Ecological Risk Assessment* (USEPA, 1992b)
- *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (USEPA, 1997d)
- Supplemental Guidance to RAGS: Region IV Bulletins on Ecological Risk Assessment (USEPA, 1995b)
- *Proposed Guidelines for Ecological Risk Assessment* (USEPA, 1996c)

Risk assessment guidance included in the USEPA "Eco Update" bulletins (1991c, 1992c, and 1992d) and recent publications (e.g., Maughan, 1993; Suter, 1993) were also consulted.

This ERA was initiated prior to the release of the Final Process Document (USEPA, 1997d), which has become the standard for evaluating ecological impacts at CERCLA sites. The structure of this ERA differs somewhat from the guidance presented in the Process Document although there are no substantive effects on the outcome of this assessment. An evaluation of the impacts to the ERA conclusion had the new guidance been strictly adhered to is provided in Appendix G.

This ERA was conducted to determine if ecological receptors are potentially exposed to contaminants from Site 13 at concentrations causing adverse ecological effects. The ERA for Site 13 includes the following eight sections:

- Site Characterization (Section 7.1) describes current ecological conditions at the site;
- Problem Formulation (Section 7.2) establishes the goals and focus of the assessment and identifies major factors to be considered;
- Hazard Assessment and Selection of ECPCs (Section 7.3) reviews the analytical data and identifies chemicals present at the site that may pose ecological risks;
- Exposure Assessment (Section 7.4) identifies complete exposure pathways and quantifies the magnitude and frequency of exposure;

- Ecological Effects Assessment (Section 7.5) identifies potential adverse effects to ecological receptors associated with the chemicals of concern identified in Section 7.3;

- Risk Characterization (Section 7.6) integrates exposure and concentration-toxicity response information to derive a likely estimate of adverse effects;

- Uncertainties (Section 7.7) identifies assumptions of the ERA process possibly influencing the risk assessment conclusions; and

- Summary of Ecological Risks (Section 7.8).

7.1 SITE CHARACTERIZATION. Site 13 is located adjacent to the eastern facility boundary near the South Air Field (Figure 1-2). The site is rectangular in shape and covers approximately 7.5 acres. The landfill operated as a trench and fill operation from 1979 until 1984. The landfill trenches run approximately north to south. The landfill primarily received residual waste, but may have received asbestos material wrapped in plastic, waste solvents, and residue from paint-stripping operations. Additional site information is provided in Chapter 2.0 of this document.

As shown on Figure 7-1, the habitat at Site 13 is characterized as planted pine forest, with some areas containing shrubs and herbaceous plants. The shrub and herbaceous plant areas are centrally located and are consistent with plant recolonization following cleaning and disturbance of the surface soil. The remains of an open trench are located in the southern portion of the site. A dense red clay is visible in the open trench and adjacent areas where the surface soil has been removed. The exposed clay area contains almost no vegetation cover.

The "Y" ditch is man-made and runs north to south along the site's western and southern boundaries (Figure 7-1). Because the ditch is topographically higher than the site, it is unlikely storm water runoff from Site 13 will migrate toward the "Y" ditch within the NAS Whiting Field property boundary. However, off-site migration of surface soil carried by overland flow from Site 13 to the "Y" drainage ditch is possible, south and east of the site. The "Y" ditch is a conduit for surface water runoff and is only flooded during and immediately after storm events. Water is not present in the ditch for long enough periods to support aquatic receptors. Terrestrial receptors could be exposed to surface water briefly following precipitation but these exposures would be sporadic in nature and unlikely to be significant.

The pine trees along the perimeter of the site are reaching maturity (sizes range from six to 12 inches in diameter), while young pine saplings, shrubs, and herbaceous plants dominate the center portion of the site. The pine trees, which consist of long-leaf pine (*Pinus palustris*) and slash pine (*P. elliotti*), are randomly spaced. The areas containing shrubs and young saplings are more open. Plants identified during the 1995 site characterization walkover of Site 13 include Agalinis (*Agalinis fasciculate and A. setacea*), ragweed (*Ambrosia* sp.), broom sedge (*Andropogon gyrans*), white-topped aster (*Aster sp.*), groundsel tree (*Baccharis halimifolia*), partridge pea (*Chamaecrista fasciculate*), goldenaster (*Chrysopsis sp*), panic grass (*Dichanthelium sp.*), persimmon (*Diospyros*

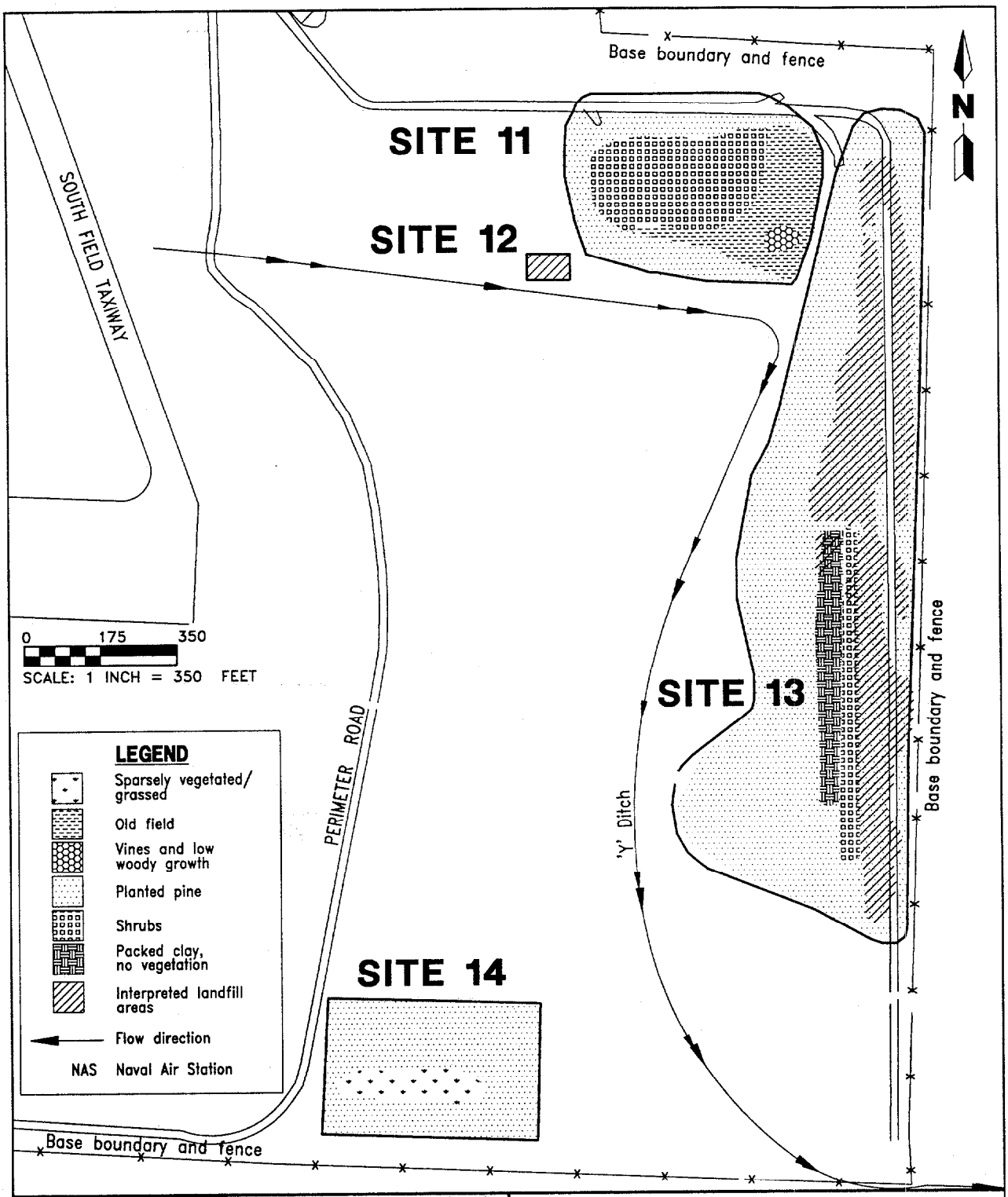


FIGURE 7-1
SITES 11, 12, 13, AND 14
VEGETATIVE COVER MAP

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REMEDIAL INVESTIGATION REPORT
SITE 13, SANITARY LANDFILL

NAS WHITING FIELD
MILTON, FLORIDA

virginiana), dog fennel (*Eupatorium capillifolium*), moss verbena (*Glandularia pulchella*), bladder-pod (*Glottidium vesicarium*), rabbit tobacco (*Gnaphalium obtusifolium*), Hedyotis (*Hedyotis corymbosa*), Spanish daisy (*Helenium amarum*), pineweed (*Hypericum gentianoides*), St. Andrew's Cross (*Hypericum hypericoides*), buttermint (*Hyptis mutabilis*), Yaupon holly (*Ilex vomitoria*), morning glory (*Ipomoea cordatotriloba*), red cedar (*Juniperus silicicola*), blazing star (*Liatris sp.*), Chinese privet (*Ligustrum sinense*), seed box (*Ludwigia alternifolia*), pokeweed (*Phytolacca americana*), joint weed (*Polygonella polygama*), smartweed (*Polygonum sp.*), rustweed (*Polypremum procumbens*), Mexican clover (*Richardia brasiliensis*), black berry vine (*Rubus sp.*), willow tree (*Salix nigra*), popcorn tree (*Sapium sebiferum*), goldenrod (*Solidago sp.*), and Verbena (*Verbena bonariensis*).

Site 13 is surrounded by planted pine forest and old fields. NAS Whiting Field maintains a ecosystem management program for planting and harvesting of long-leaf and slash pine, including controlled burns and timber harvesting activities. As part of the ecosystem management plan, planted pine forests undergo periodic burning, usually once every four years, and selective thinning of trees every eight to ten years. These forestry management activities provide a variety of habitats and food sources. The planted pine areas within and surrounding Site 13 are reaching a mature status with a well-developed canopy and an open understory typical of uplands pine forests of the southeastern United States.

Southeastern United States pine forests provide habitat for a diverse array of birds, including insectivorous gleaners of pine needles and bark, flycatchers, seed-eaters, and nocturnal and diurnal aerial predators (Wolfe et. al., 1988). The pine flatwoods within and surrounding Site 13 are likely to host such an assemblage of species. Birds of prey, such as owls and hawks, may also nest in these wooded areas.

The plant and terrestrial invertebrate biomass at Site 13 likely serves as a forage base for a variety of wildlife species, including adult amphibians, reptiles, small birds, and small mammals. Small reptiles, mammals, and birds may forage in the open areas at the site and return to the surrounding forested area for protection. Predatory birds and mammals inhabiting the surrounding pine flatwoods areas may also be attracted to the sites' shrub covered and open areas. The adjacent forested area is sufficiently large to provide cover and feeding habitat for larger predatory animals (e.g., foxes, owls, and hawks).

Mammals living in pine flatwoods may include the eastern cottontail rabbit (*Sylvilagus floridanus*), the hispid cotton rat (*Sigmodon hispidus*), cotton mouse (*Peromyscus gossypinus*), armadillo (*Dasypus novemcinctus*), and white-tailed deer (*Odocoileus virginianus*). Predatory mammals and birds such as the red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), great-horned owl(Bubo virginianus), and red-tailed hawk (Buteo jamaicensis) may feed on small mammals and birds occurring in these environments.

Chemicals from Site 13 may potentially migrate into the groundwater and discharge into tributaries leading to Big Coldwater Creek (located approximately 3,000 feet downgradient and southeast of the site). Groundwater discharge to surface water is not evaluated as part of the ERA because Big Coldwater Creek receives groundwater discharge and storm water runoff from multiple sources of potential contamination at NAS Whiting Field. In addition, chemical concentrations detected in Site 13 groundwater are low and are not likely to be a concern for

current and future discharges to surface water. Table 5-13 presents the analytical results for groundwater samples collected at Site 13. Although six organics [acetone (70 μg/ℓ), 1,1-dichloroethane (9 μg/ℓ), 1,2-dichloroethene (5.0 μg/ℓ), carbon disulfide (3 μg/ℓ), tetrachloroethene (1 μg/ℓ), and trichloroethene (7 μg/ℓ)] were detected in groundwater from Site 13, none of the constituents were detected in surface soil samples from Site 13 (concentrations for each analyte are the maximum detected values). The majority of inorganics detected in Site 13 groundwater were detected at concentrations below the background screening values. Background screening values are equal to 2 times the average detected inorganic concentration in background samples and are presented in Section 3.3 of the GIR (HLA, 1998). Six non-nutrient inorganics (arsenic [1.1 μg/ℓ], barium [163 μg/ℓ], iron [39,600 μg/ℓ], lead [2.3 μg/ℓ], manganese [753 μg/ℓ], and zinc [735 μg/ℓ]) were detected in groundwater at maximum detected concentrations greater than their respective background screening concentrations. Additional information on the groundwater sampling and results is provided in Section 5.7 of this document.

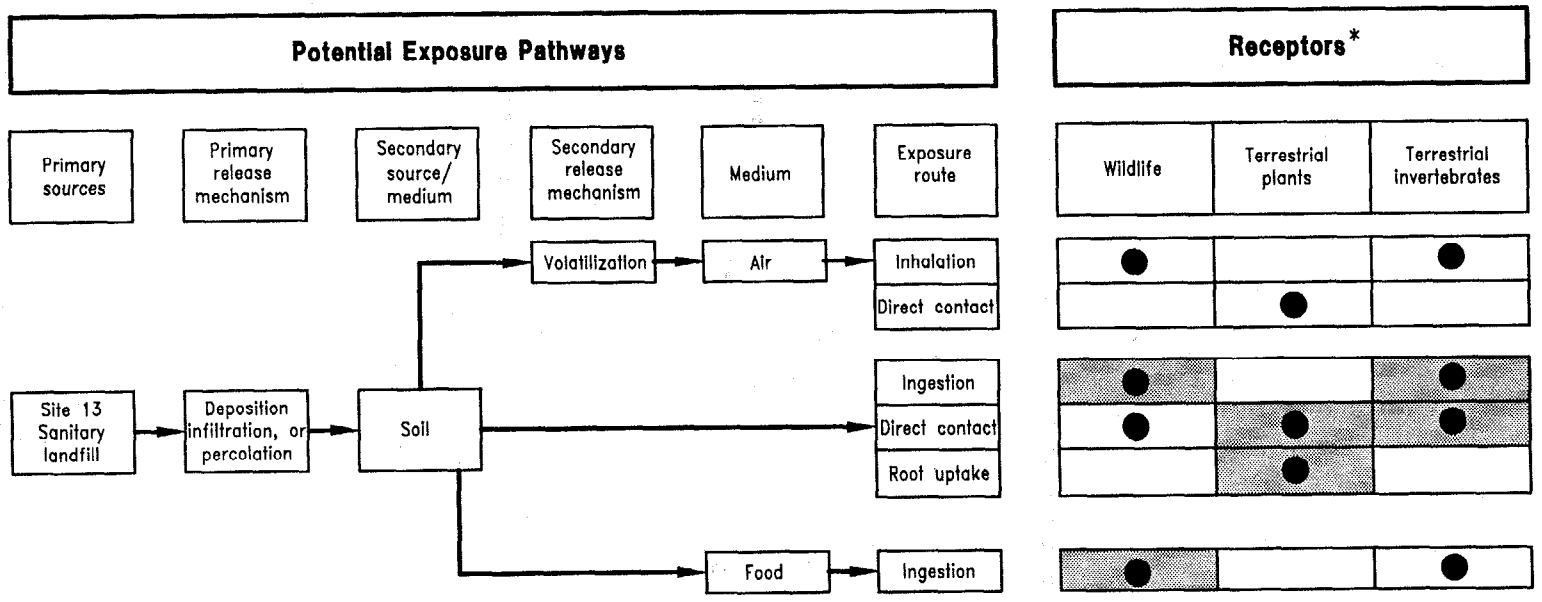
7.2 PROBLEM FORMULATION. The problem formulation is the initial step of the ERA process. Problem formulation is composed of identification of receptors, identification of exposure pathways for those receptors, and selection of assessment and measurement endpoints based on information gathered from the site characterization.

7.2.1 Identification of Receptors Ecological receptors potentially using the planted pine forest of Site 13 may include terrestrial wildlife (i.e., mammal, birds, reptiles, and adult amphibians), terrestrial plants, and soil invertebrates. Terrestrial flora and fauna potentially using NAS Whiting Field are identified in the GIR (HLA, 1998). Aquatic receptors are not evaluated in the ERA because no aquatic habitat exist at Site 13.

Certain species potentially residing at NAS Whiting Field are protected by Federal and/or State Laws. A list of State and federally protected species is provided in Appendix G of the GIR (HLA, 1998). Observations made during an ecological survey of NAS Whiting Field indicate that no State or federally listed rare, threatened, or endangered species or species of concern are known or likely to inhabit Site 13 (Nature Conservancy, 1997).

7.2.2 Identification of Exposure Pathways Exposure pathways are identified for three groups of receptors (terrestrial wildlife, terrestrial plants, and soil invertebrates). A complete exposure pathway includes a source of contamination, an exposure route, and a receptor. A conceptual model of the exposure pathways, from source to ecological receptors, is depicted in the contaminant pathway model for Site 13 on Figure 7-2.

All potential routes of exposure are considered in the ERA and are presented in the contaminant pathway model. The model differentiates between those exposure routes quantitatively evaluated and those qualitatively discussed. This limitation is necessary to focus the risk evaluation on those pathways for which contaminant exposures are the highest and most likely to occur. Those pathways unable to be quantitatively evaluated, due to a lack of toxicological information, are qualitatively discussed and addressed as uncertainties. The general approach used to identify exposure pathways for the three groups of receptors is explained below.



LEGEND

ERA	Ecological risk assessment
OU	Operable unit
NAS	Naval Air Station

NOTES:

1. ● Indicates that the receptor was evaluated in the ecological risk assessment.
2. * Shading indicates the exposure pathways that are quantitatively evaluated for receptors in the Site 13 ERA. Nonshaded pathways are evaluated qualitatively, no quantitatively, due the lack of toxicity information, or because they are not considered significant.

FIGURE 7-2
CONTAMINANT PATHWAY MODEL FOR SITE 13 ECOLOGICAL RECEPTORS

REMEDIAL INVESTIGATION REPORT SITE 13, SANITARY LANDFILL

NAS WHITING FIELD MILTON, FLORIDA

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Terrestrial Wildlife. Terrestrial wildlife may be exposed to contaminants in surface soil and food items contaminated as a result of ingestion, dermal adsorption, and inhalation of fugitive dust and volatile emissions. Because surface water is not present at Site 13, only exposures associated with ingestion of surface soil and potentially contaminated food are evaluated in the Site 13 ERA. Dermal adsorption and inhalation pathways are negligible based on the type and magnitude of ECPCs at the site.

Dermal adsorption is considered a negligible exposure pathway because the presence of fur, feathers, or chitinous exoskeleton is likely to prevent contamination from coming in direct contact with the skin (personal communication with Ted Simon, USEPA Region 4, September 1997). In addition, soil trapped in the fur or feathers is likely to be ingested during grooming or preening activities, which are evaluated as part of the direct ingestion exposure pathway.

Exposure via inhalation of fugitive dust is also not likely to be a significant exposure pathway because the vegetation at Site 13 would limit the release of fugitive dust. Although methylene chloride, a VOC, was detected in the surface soil at Site 13, exposures associated with VOCs are not evaluated because of the low detection frequency (4 out of 10 sampling locations) and low concentration (maximum detected concentration of 8 $\mu g/kg$). Also, no burrowing animals were observed at Site 13 during the site characterization, although this habitat may be suitable to these species.

Potential contaminant exposures for reptiles and adult amphibians exist at NAS Whiting Field; however, ingestion toxicity data and bioaccumulation factors (BAF) are generally not available for these receptors. Therefore, potential risks associated with ingestion of affected media and food to these reptiles and amphibians will be qualitatively addressed in Section 7.7 of the ERA.

Terrestrial Plants and Invertebrates. Terrestrial plants and soil invertebrates may be exposed to contamination in surface soil by direct contact with and root uptake (plants) or ingestion (invertebrates) of soil. The ingestion exposure routes include the ingestion of soil and food items containing chemicals accumulated from Site 13 surface soil. The inhalation exposure route is not evaluated due to the reasons discussed above for terrestrial wildlife. Because the depth to groundwater is approximately 40 to 65 feet bls, far below the root zone of Site 13 plants, terrestrial plants are not expected to be exposed to potential groundwater contamination. In order to evaluate potential exposure of deep-rooted plants and soil invertebrates exposed to subsurface soil, an evaluation of the analytes detected in subsurface soil was conducted and is included in Appendix G.

7.2.3 Identification of Endpoints The assessment and measurement endpoints selected for the Site 13 ERA are listed in Table 7-1. Assessment endpoints represent the ecological component to be protected, whereas the measurement endpoints approximate or provide a measure of the achievement of the assessment endpoint. One of the assessment endpoints selected for the Site 13 ERA is the survival and maintenance of receptor populations and communities occurring at the site. The measurement endpoints used to gauge the likelihood of population- and community-level effects for Site 13 are chemical-specific toxicological benchmark values derived from the literature that are based on laboratory-measured survival, growth, and reproductive effects. Table 7-1 presents the assessment

Table 7-1
Ecological Risk Assessment Endpoints
Selected for Site 13

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Assessment Endpoint	Receptor	Measurement Endpoint	Decision Point
• Reduction in biomass of terrestrial plants used as forage material at Site 13.	Wildlife Species	Chemical concentrations (mg/kg) detected in surface soil samples from Site 13 resulting in adverse effects on growth, reproduction, or survival of terrestrial plants.	The reasonable maximum exposure concentration (mg/kg) of an ECPC in surface soil from Site 13 is greater than the terrestrial plant RTV.
• Reduction in the abundance of invertebrates used as forage material at Site 13.	Wildlife Species	Chemical concentrations (mg/kg) detected in surface soil samples from Site 13 resulting in adverse effects on survival (i.e., LC_{50} studies) or measured adverse effects on reproduction and growth to terrestrial invertebrates.	The reasonable maximum exposure concentration (mg/kg) of an ECPC in surface soil from Site 13 is greater than the terrestrial invertebrate RTV.
• Survival and maintenance of wildlife populations.	Wildlife Species	Oral chemical doses (mg/kg BW/day) based on measured adverse effects on growth, reproduction, or survival (i.e., NOAEL, LOAEL, and LD_{50} studies) of mammalian or avian laboratory test populations.	Comparison of potential dietary exposures in mammalian and avian wildlife with literature-derived RTVs. (HQ >1 indicate potential risks.)

Notes: mg/kg = milligrams per kilogram.
ECPC = ecological chemical of potential concern.
RTV = reference toxicity value.
LC_{50} = lethal concentration to 50 percent of a test population.
BW/day = body weight per day.
NOAEL = no observed adverse effect level.
LOAEL = lowest observed adverse effect level.
LD_{50} = lethal dose to 50 percent of a test population.
HQ = hazard quotient.
> = greater than.

endpoint, endpoint species, measurement endpoint, and decision point (i.e., the outcome at which additional evaluation is warranted).

Three hypotheses were developed to gauge potential risks associated with exposure to Site 13 surface soil. These hypotheses are designed for multiple species and trophic levels and represent both individual and community dynamics. Hypotheses for the Site 13 ERA are listed below:

1. Are ECPCs present in the surface soil at concentrations sufficiently high to reduce plant or soil invertebrate biomass or plant cover availability such that small mammal and bird populations could be affected?

2. Are ECPCs concentrations in plants and invertebrates sufficiently high as to adversely affect small mammal or bird populations following the consumption of contaminated food items?

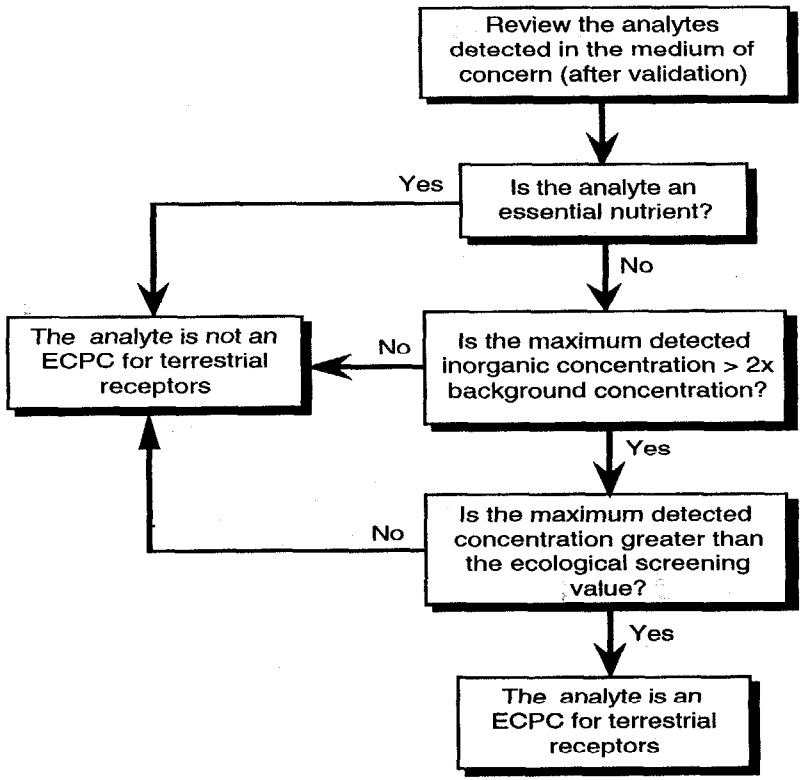
3. Are bioaccumulating chemicals present at concentrations sufficiently high as to reduce survivability, growth, or reproduction in top predators (i.e., foxes and owls)?

7.3 HAZARD ASSESSMENT AND SELECTION OF ECPCs. The hazard assessment includes a review of analytical data and selection of ECPCs. ECPCs represent analytes detected in environmental media (i.e., surface soil) that are considered in the ERA and could present a potential risk for ecological receptors. The process for selecting ECPCs is depicted on Figure 7-3. Additional details regarding the ECPC selection process are provided in Subsection 2.4.2 of the GIR (HLA, 1998). Analytical data for Site 13 were evaluated for use in risk assessment pursuant to national guidance, *Guidance for Data Useability in Risk Assessment (Parts A and B)* (USEPA, 1992e).

Calcium, iron, magnesium, potassium, and sodium are excluded as ECPCs for surface soil. These analytes are considered to be essential nutrients and not toxic. The rationale for eliminating essential nutrients as ECPCs is provided in the GIR (HLA, 1998).

Inorganic chemicals representative of background conditions are not selected as ECPCs. In accordance with USEPA Region IV guidance (USEPA, 1991d), an inorganic analyte is not selected as an ECPC if the maximum detected concentration is less than 2 times the average detected inorganic concentration in background samples. The maximum detected concentrations are compared against representative site-specific background surface soil screening concentrations to eliminate chemicals that are unlikely to be site-related.

A site-specific surface soil background investigation was conducted at NAS Whiting Field, and the findings are presented in Paragraph 3.3.1.1 of the GIR (HLA, 1998). The site-specific background study used to establish background screening values for Site 13 surface soil consists of nine surface soil samples (BKG-SL-02, BKG-SL-06, BKG-SL-07, BKG-SL-08, BKS00101, BKS00201, BKS00301, BKS00401, and BKS00501) and a duplicate sample (BKS00201D) collected from areas containing Troup and Lucy soil types. These soil types are considered the most similar to the soil from Site 13.



NOTES:
ECPC = ecological chemical of potential concern
> = greater than
x = times

FIGURE 7-3
ECOLOGICAL CHEMICAL OF POTENTIAL CONCERN SELECTION PROCESS

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NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA

2534-09 WHITING RI 13 FIG 7-3 FINAL 042398HAS

Analytes exceeding the background screening concentrations and not being essential nutrients are compared against ecological screening values for surface soil. The surface soil ecological screening values are the Region IV ecological screening values (mg/kg) for soil (USEPA, 1998). If the maximum detected concentration of an analyte exceeds the ecological screening value, the analyte is retained as an ECPC for all ecological receptors including terrestrial wildlife, terrestrial plants, and soil invertebrates.

Ten surface soil samples (13-SL-01, 13-SL-02, 13-SL-03, 13-SL-04, 13-SL-05, 13S00101, 13S00201, 13S00301, 13S00401, and 13S00501) and one duplicate sample (13-SL-05A) were collected at Site 13 (see Figure 3-2). Table 7-2 presents a summary of the respective surface soil analytical data and the following information: frequency of detection, range of detection limits, range of detected concentrations, average of detected concentrations, background screening concentrations, ecological screening values, and selected ECPCs.

ECPCs selected for Site 13 surface soil include one VOC (methylene chloride), one SVOC (BEHP) and four inorganics (aluminum, chromium, manganese, and vanadium).

7.4 EXPOSURE ASSESSMENT. The purpose of the ecological exposure assessment is to estimate or measure the amount of an ECPC to which an ecological receptor may be exposed. The following sections briefly describe how contaminant exposures are estimated or measured for wildlife, terrestrial plants, and invertebrates at Site 13. The contaminant pathway model (Figure 7-2) provides a summary of the potential exposure pathways at Site 13 for each group of receptors. Additional details regarding the exposure assessment are provided in the GIR (HLA, 1998).

7.4.1 Calculation of EPCs The EPC is a representative concentration used for evaluating risks throughout this ERA. RME and central tendency (CT) concentrations are derived for each ECPC. Because the sample size is equal to ten, the RME value is equal to the lesser of the maximum detected concentration and the 95 percent upper confidence level (UCL) calculated on the log-transformed arithmetic mean (USEPA, 1992g). The calculation of the 95 percent UCL uses one-half of the detection limit as a surrogate value for samples where no analyte concentration was detected.

If potential risks are predicted based on the RME scenario, then the CT exposure scenario is also evaluated. The CT exposure concentration is represented by the arithmetic mean of all samples. One-half of the detection limit is used as a surrogate value for sample results below the detection limit. Table 7-2 presents the RME and CT EPCs for selected ECPCs identified at Site 13.

7.4.2 Terrestrial Wildlife Exposure routes for wildlife receptors include direct ingestion of surface soil and indirect exposure through ingestion of food containing site related chemicals. The actual amount of an ECPC taken in by wildlife species (i.e., ingestion dose in mg/kg per day) depends on a number of factors. A potential dietary exposure (PDE) model is used to estimate exposure to representative wildlife species. The PDE (or body dose) is calculated for each ECPC using the equations presented in Table 7-3 and the methodologies described in the GIR (HLA, 1998).

Table 7-2
Selection of Ecological Chemicals of Potential Concern for Surface Soil Associated with Site 13

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Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentration Range[2]	Average of Detected Concentrations[3]	Background Screening Concentration[4]	Ecological Screening Value[5]	Chemical of Ecological Concern	95th % UCL[6]	Average of All Samples[7]	Exposure Point Concentration	
										RME[8]	CT[9]
Volatiles Organic Compounds (µg/kg)											
Methylene chloride	4/10	11 to 15	4 to 8	5	ND	NSC	Yes	7.1	6	7.1	6
Semivolatile Organic Compounds (µg/kg)											
Fluoranthene	1/10	370 to 395	51	51	ND	100	No[10]				
Pyrene	1/10	370 to 395	61	61	ND	100	No[10]				
bis(2-Ethylhexyl)phthalate	4/10	370 to 395	95 to 450	194	80.3	NSC	Yes	260	189	260	189
Inorganic Analytes (mg/kg)											
Aluminum	10/10	40	9,285* to 38,300	16,040	15,334	50	Yes	22,026	16,040	22,026	16,042
Arsenic	10/10	2	1.6 to 6.9	3.8	3	10	No[10]				
Barium	10/10	40	5.9 to 26.6	11	23.8	165	No[10]				
Beryllium	4/10	0.06 to 1	0.06 to 0.16	0.09	0.36	1.1	No[10,11]				
Calcium	10/10	1,000	34.2 to 525	183	402	NSC	No[12]				
Chromium	10/10	2	6.9 to 27.9	13.9	10.8	0.4	Yes	24.2	13.9	24.2	13.9
Cobalt	9/10	0.34 to 10	0.48 to 1.9	0.93	3	20	No[10,11]				
Copper	6/10	5	4.1* to 9.2	6.7	9.4	40	No[10,11]				
Iron	10/10	20	5,620 to 23,500	11,400	8,588	200	No[12]				
Lead	10/10	0.6 to 1	3.6* to 10.5	6.2	11.2	50	No[10,11]				
Magnesium	10/10	1,000	54.05* to 203	116	258	NSC	No[11,12]				
Manganese	10/10	3	18.7 to 407	95.4	404	100	Yes	219	95.5	219	95.5
Mercury	10/10	0.1	0.01 to 0.05	0.03	0.12	0.1	No[10,11]				

See notes at end of table.

Table 7-2 (Continued)
Selection of Ecological Chemicals of Potential Concern for Surface Soil Associated with Site 13

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For Surface and Subsurface Soil at
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Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentration Range[2]	Average of Detected Concentrations[3]	Background Screening Concentration[4]	Ecological Screening Value[5]	Chemical of Ecological Concern	95th % UCL[6]	Average of All Samples[7]	Exposure Point Concentration	
										RME[8]	CT[9]
Inorganic Analytes (mg/kg) (Continued)											
Nickel	7/10	2.4 to 8	2.075* to 6.7	3.7	7.2	30	No[10,11]				
Potassium	1/10	132 to 1,000	150	150	177	NSC	No[10, 12]				
Selenium	1/10	0.46 to 1	0.27	0.27	0.44	0.81	No[10,11]				
Silver	5/10	2	0.39 to 1.2	0.70	0.7	2.0	No[10]				
Sodium	5/10	1,000	173 to 219*	194	388	NSC	No[12]				
Vanadium	10/10	10	14.5 to 62.4	30.9	21.2	2.0	Yes	43.8	30.9	43.8	30.9
Zinc	5/10	4	7.8 to 16.8*	11.4	15.4	50	No[10]				

See notes at end of table.

Table 7-2 (Continued)
Selection of Ecological Chemicals of Potential Concern for Surface Soil Associated with Site 13

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[1] Frequency of detection is the number of samples in which the analyte was detected in relation to the total number of samples analyzed (excluding rejected values).
[2] The value indicated by an asterisk is the average of a sample and its duplicate. For duplicate samples having one nondetect value, one-half of the contract-required quantification limit/contract-required detection limit is used as a surrogate concentration for the sample where a nondetect was reported.
[3] The mean of detected concentrations is the arithmetic mean of all samples in which the analyte was detected. It does not include those samples with "R", "U", or "UJ" validation qualifiers.
[4] The background screening value is twice the average of detected concentrations for inorganic analytes in background samples. Organic analyte values are one times the average of detected concentrations. Organic values are included for comparison purposes only (i.e., not used to select ecological chemicals of potential concern).
[5] The ecological screening values are the Region IV recommended ecological screening values (mg/kg) for soil. USEPA Region IV memorandum 4WD-OTS, December 22, 1998.
[6] The 95th percent upper confidence limit (UCL) is calculated on the log-transformed average of all samples using the formula provided in the U.S. Environmental Protection Agency (USEPA) *Supplemental Guidance to RAGS: Calculating the Concentration Term*. The 95 percent UCL is not calculated when there are less than 10 total samples. (USEPA, 1992f).
[7] The average of all samples assigns a value of one-half of the contract-required quantification limit/contract-required detection limit as a surrogate concentration for samples where a nondetect was reported.
[8] Reasonable maximum exposure (RME) concentrations are the lesser of the maximum detected concentration or the 95th percent UCL.
[9] Central tendency (CT) concentration is equal to the lesser of the average of all samples or the maximum exposure point concentration.
[10] The maximum detected concentration is less than the ecological screening concentration. Therefore, the analyte will not be evaluated further.
[11] The maximum detected concentration is less than the background screening concentration. Therefore, the analyte will not be evaluated further.
[12] Analyte is an essential nutrient, and not considered toxic. Therefore, the analyte will not be evaluated further.

Notes: Samples: 13-SL-01, 13-SL-02, 13-SL-03, 13-SL-04, 13-SL-05, 13S00101, 13S00201, 13S00301, 13S00401, and 13S00501.
Duplicate sample: 13-SL-05A.
Background samples: BKG-SL-02, BKG-SL-06, BKG-SL-07, BKG-SL-08, BKS00101, BKS00201, BKS00301, BKS00401, and BKS00501.
Background duplicate sample: BKS00201D.

% = percent.
µg/kg = micrograms per kilogram.
ND = not detected in any background sample.
NSC = no screening concentration available.
mg/kg = milligrams per kilogram.
* = average of sample and duplicate.
USEPA = U.S. Environmental Protection Agency.

Table 7-3
Estimation of Potential Chemical Exposures for Representative Wildlife Species

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Estimation of Chemical Exposures Related to Surface Soil

Scope: Estimates the amount (dose) of a chemical ingested and accumulated by a species via incidental ingestion of surface soil and food items containing site related chemicals.

Soil Chemical Concentration: The maximum detected concentration of the ecological chemicals of potential concern (ECPCs) when the sample size is ≤ 9, and the lesser of the maximum detected concentration or the 95th percent upper confidence limit (UCL) of the mean when the sample size is ≥ 10.

Soil Exposure Concentration:

$$\text{Soil Exposure (mg/kg)} = \left(\text{\% of Diet as Soil} \times \text{Soil Concentration (mg/kg)}\right)$$

Primary Prey Item Concentration (T_N)

$$\text{Primary Prey Item Concentration (mg/kg)} = \left(BAF_{inv\ or\ plant} \times \text{Soil Concentration (mg/kg)}\right)$$

Secondary Prey Item Concentration (T_N):

$$\text{Secondary Prey Item Concentration (mg/kg)} = \left(BAF_{mam\ or\ bird} \times \text{Tissue Concentration of Primary Prey Items}^{*}\ \text{(mg/kg)}\right)$$

where BAF = bioaccumulation factor or mg/kg fresh weight tissue over mg/kg dry weight soil for invertebrates and plants, and mg/kg fresh weight tissue over mg/kg fresh weight food for small mammals and small birds.

* For a discussion of the weighted chemical concentration in prey items, see explanation of the PDE term below, and the General Information Report (Harding Lawson Associates, 1998)

Total Exposure Related to Surface Soil:

$$\text{PDE (mg/kgBW-day)} = \frac{\left[P_1 \times T_1 + \ldots + P_N \times T_N + \text{soil exposure}\right] \times IR_{Diet} \times SFF \times ED}{BW}$$

where PDE = potential dietary exposure (mg/kg BW-day),
P_N = percent of diet composed of food item N,
T_N = tissue concentration in food item N (mg/kg),
IR_{Diet} = food ingestion rate of receptor (kg of food or dietary item per day),
BW = body weight (kg) of receptor,
SFF = site foraging frequency (site area [acres] divided by home range [acres]), assumed to be equal to 1 for lethal exposure scenario, and
ED = exposure duration (fraction of year species is expected to occur on site.

Notes: ≤ = less than or equal to.
≥ = greater than or equal to.
mg/kg = milligrams per kilogram.
% = percent.
inv = invertebrate species.
mam = mammal species.
BAF = bioaccumulation factors.
mg/kg BW-day = milligrams per kilograms of body weight per day.
kg = kilograms.

Body dose is calculated using the PDE model for several wildlife species from different trophic guilds that may be present at the site. The model uses species-specific feeding and habitat characteristics to estimate chemical exposures to wildlife species respective to their position in the food chain. Terrestrial receptors were chosen to represent the trophic levels typically found in disturbed areas and the pine forest habitat present at Site 13. The representative wildlife species considered in the ERA for Site 13 are summarized in Table 7-4 and discussed below.

- Cotton mouse (*Peromyscus gossypinus*). The cotton mouse represents a small mammalian herbivore potentially exposed to contaminants in soil and in plant tissue (accumulated from the soil). The cotton mouse home range is estimated at 0.147 acres and could reside entirely on Site 13(USEPA, 1993b). The cotton mouse represents the small mammal herbivore community at Site 13.

Table 7-4
Ecological Receptors Evaluated For Site 13

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For Surface and Subsurface Soil at
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Receptor Evaluated		Method of Evaluation
Common Name	Scientific Name	
Terrestrial Plant	NA	Benchmark comparison
Terrestrial Invertebrate	NA	Benchmark comparison
Wildlife:		
Cotton mouse	*Peromyscus gossypinus*	Food-web model
Short-tailed shrew	*Blarina brevicauda*	Food-web model
Eastern meadowlark	*Sturnella magna*	Food-web model
Red fox	*Vulpes vulpes*	Food-web model
Great-horned owl	*Bubo virginianus*	Food-web model

Note: NA = not applicable.

- Short-tailed shrew (*Blarina brevicauda*). The short-tailed shrew finds suitable habitat in forests, fields, marshes, and brush. It primarily feeds on earthworms, snails, centipedes, insects, small vertebrates, and slugs (DeGraaf and Rudis, 1986). Insectivorous species may receive relatively high chemical doses of bioaccumulating compounds as a result of their voracious appetites. The shrew represents small omnivorous mammals potentially be found in the pine forest and open areas of Site 13.

- Eastern meadowlark (*Sturnella magna*). The eastern meadowlark is most commonly found in open pastures, prairies, farms, and meadows and has a home range of approximately 5 acres. The meadowlark feeds primarily on invertebrates, although its diet is supplemented with plants. The meadowlark represents insectivorous avian receptors found in disturbed areas of Site 13 (DeGraaf and Rudis, 1986).

- Red fox (*Vulpes vulpes*). This omnivorous mammal prefers open woodlands and grassy fields and is most active at night and twilight. It is an opportunistic forager, feeding on small mammals, birds, amphibians, reptiles, invertebrates, berries, and other fruits (Burt and Grossenheider, 1976). The red fox has an estimated home range of approximately 250 acres and represents the large predatory mammal guild at Site 13.

- Great-horned owl (*Bubo virginianus*). The great horned owl is primarily a nocturnal hunter of small mammals. Its habitat includes deep woods and heavily wooded swamps often near open country where it may hunt for prey items consisting of small mammals and birds (DeGraaf and Rudis, 1986). The great horned owl home range is approximately 15 acres. The owl represents the predatory avian carnivores of Site 13.

Parameters for quantitatively evaluating exposures to wildlife include body weight, food ingestion rate, home range, and relative consumption of food items. Exposure assumptions for each of the representative wildlife species for Site 13 are provided in Table 7-5 and in Table G-6 of Appendix G. In addition to these parameters, the species foraging habits and bioaccumulation in food items are also considered.

The site foraging frequency (SFF) is an adjustment term accounting for the frequency a receptor feeds within the site area. The SFF is based on both the acreage of the site relative to the receptor's home range and the fraction of the year the receptor would be exposed to site-related chemicals (i.e., the exposure duration). By definition the SFF cannot exceed 1. Site 13 (approximately 7.5 acres) is larger than the home range of the cotton mouse, short-tailed shrew, and eastern meadowlark and smaller than the home range for the red fox and great-horned owl. Because all representative wildlife species are expected to actively forage at the site year round, it is assumed the exposure durations for all representative wildlife species are 1.

Wildlife species may be exposed to ECPCs in surface soil via incidental ingestion or by ingestion of prey items that have bioaccumulated these ECPCs. A PDE model is used to estimate the dose received by each representative wildlife species for each ECPC in all media according to the equations in Table 7-3 and the methodologies described in Subsection 2.4.3 of the GIR (HLA, 1998).

BAFs are used in the wildlife PDE model to estimate the transfer of chemicals between soil and plants or soil invertebrates, and between these organisms and primary consumer species. To estimate the PDE, tissue concentrations of ECPCs in prey items are estimated using BAFs. BAFs for invertebrate and plant food items are defined as the ratio of the ECPC concentration in plant or invertebrate tissue (mg chemical/kg tissue wet-weight) to the ECPC concentration in surface soil (mg chemical/kg dry-weight soil). BAFs reported in the scientific literature for avian and mammalian receptors are the reported ratios of ECPC concentrations in the tissues of these receptors (mg chemical/kg tissue wet-weight) to the concentrations of ECPCs in their food items (mg chemical/kg tissue wet-weight). BAFs for most receptors are extrapolated from literature values or estimated using regression equations from scientific literature. Based on the evidence provided in several reference materials (Suter, 1993; Maughan, 1993), an assumption is made that VOCs do not bioaccumulate in prey tissue. The general approach used to select BAFs for Site 13 is summarized in Table 7-6. BAFs for

Table 7-5
Exposure Parameters for Representative Wildlife Species

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Representative Wildlife Species	Body Weight (kg)	Reported Diet	Assumed Diet for Terrestrial Exposure Assessment (% of diet)	Food Ingestion Rate (kg/day)	Home Range (acres)
Cotton mouse [a] (***Peromyscus gossypinus***)	0.021 [b]	Seeds and some insects. [c]	88% Plants 10% Invertebrates 2% Soil [d]	0.0029 [e]	0.147 [f]
Short-tailed shrew (***Blarina brevicauda***)	0.017 [g]	Earthworms, slugs and snails, fungi, insects, and vegetation. [c]	78% Invertebrates 12% Plants 10% Soil [c]	0.0024 [e]	0.96 ± 0.09 [c]
Eastern meadowlark (**Sturnella magna**)	0.087 [h]	Insects, weed seeds and grass seeds, 75% of diet is invertebrates (beetles, grubs, bugs, grasshoppers, crickets, ants, and spiders). [h]	75% Invertebrates 20% Plants 5% Soil [h]	0.0119 [j]	5 [h]
Red fox (**Vulpes vulpes**)	4.69 [c]	Small mammals, birds, and invertebrates, as well as berries and other fruits. [c]	57% Small mammals 20% Invertebrates 10% Small birds 10% Plants 3% Soil [c]	0.24 [e]	250 [c]
Great-horned owl (**Bubo virginianus**)	1.50 [i]	Mostly rabbits, mice, rats, squirrels, birds. bats, snakes, frogs, crayfish, and grasshoppers. [i]	80% Small mammals 19% Birds 1% Soil [c]	0.078 [j]	15 [k]

References:
[a] Values for the deer mouse were used for the cotton mouse (U.S. Environmental Protection Agency [USEPA], 1993b).
[b] Average of adult male and female deer mice in North America (USEPA, 1993b).
[c] Wildlife Exposure Factors Handbook (USEPA, 1993b).
[d] Deer mouse value used for cotton mouse based on similarities in diet. Other values were based on diet composition (USEPA, 1993b).
[e] Calculated using the mammal equation based on body weight (Wt.) in kg. Food ingestion (kg/day) = $0.0687 \times Wt^{0.822}$ (kg) (USEPA, 1993b).
[f] Average for male and female deer mice, Virginia/mixed deciduous forest (USEPA, 1993b).
[g] Mean of means reported for male and female shrews in summer and fall (USEPA, 1993b).
[h] Terres (1991).
[i] DeGraaf & Rudis (1986).
[j] Calculated using the bird equation based on body weight (Wt.) in kg. Food ingestion (kg/day) = $0.0582 \times Wt^{0.651}$ (kg) (USEPA, 1993b).
[k] Great-horned owl home range taken from low end of range in SE Madison County, N.Y. Hager (1957)

Notes: kg = kilograms. kg/day = kilograms per day.
% = percent. ± = plus or minus.

Table 7-6
Estimation of Bioaccumulation Factor

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Receptor Group	Nature of Approach	General Approach
Terrestrial Plants		
Unit: mg/kg wet tissue per mg/kg dry soil	Literature Values	When available, literature values were used to estimate plant bioaccum ulation factors (BAFs).
	SAR	When literature values were not available, plant BAFs for semivolatile organic compounds (SVOCs) were calculated using a regression equation based on the relationship between plant bioconcentration factors and the *n*-octanol-water partition coefficient for soil (K_{ow}s) of analytes (Travis and Arms, 1988).[1] The study found that bioconcentration factors for vegetation are inversely proportional to the square root of the K_{ow}s of an analyte.
	Extrapolation and Empirical Data	When literature values were not available, plant BAFs for inorganic compounds were obtained from Baes et al. (1984).[1]
	Assumption	Although evidence suggests that plants may transport organic analytes with log K_{ow}s < 5 (i.e., volatile organic compounds [VOCs]) from the roots into leafy portions (Briggs et al., 1982; Briggs et al., 1983), bioaccumulation data for VOCs is generally lacking in the scientific literature. In addition, evidence in the literature (Suter, 1993; Maughan, 1993) suggests that analytes with log K_{ow}s < 3.5 are not bioaccumulated into animal tissue. Therefore, it was assumed that transfer of VOCs from plant tissue to animal tissue does not occur.
Terrestrial Invertebrates		
Unit: mg/kg wet tissue per mg/kg dry soil	Literature Values	When no site-specific values were available, literature values were used to estimate BAFs for invertebrates.
	Assumption	Bioaccumulation data for VOCs are generally lacking in the scientific literature. In addition, evidence in the literature (Suter, 1993; Maughan, 1993) suggests that analytes with log K_{ow}s < 3.5 are not bioaccumulated into animal tissue. Therefore, it was assumed that soil invertebrates do not bioaccumulate VOCs.
Small Mammals		
Unit: mg/kg wet tissue per mg/kg wet food	Literature Values	When available, literature values were used to estimate BAFs for small mammals.
	SAR	When literature values were not available for SVOCs, BAFs for small mammals were estimated using a regression equation based on the uptake of organic chemicals into beef tissue from Travis and Arms (1988)[1].
	Extrapolation and Empirical Data	When literature values were not available, BAFs for small mammals for inorganics were derived from ingestion-to-beef biotransfer factors (BTFs) presented in Baes et al. (1984)[2].
	Assumption	Bioaccumulation data for VOCs are generally lacking in the scientific literature. In addition, evidence in the literature (Suter, 1993; Maughan, 1993) suggests that analytes with log K_{ow}s < 3.5 are not bioaccumulated into animal tissue. Therefore, it was assumed that small mammals do not bioaccumulate VOCs.

See notes at end of table.

Table 7-6 (Continued)
Estimation of Bioaccumulation Factor

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Receptor Group	Nature of Approach	General Approach
Small Birds Unit: mg/kg wet tissue per mg/kg wet food	Literature Values	When available, literature values were used to estimate BAFs for small birds.
	No Information	BAFs were not obtained for SVOCs or for inorganic compounds because there is little bioaccumulation data available for birds. It was assumed that small birds do not accumulate VOCs.

[1] BAFs derived from Baes et al. (1984). Values are based on analysis of literature references, correlations with other chemical and physical parameters, or comparisons of observed and predicted elemental concentrations in vegetative and reproductive plant material and soil. Data are based on dry weight and were converted to a fresh weight basis assuming that plants are 80 percent water. This is generally consistent with the water content of berries (82 to 87 percent water) and leafy vegetables (87 to 95 percent water), presented in Suter (1993). Grains contain a much lower percentage of water (approximately 10 percent); therefore, this assumption likely underestimates exposure to graminivores.
[2] BTFs were converted to a BAF (mg/kg tissue divided by mg/kg food) by multiplying by a food ingestion rate of 12 kg (dry weight) per day (average intake for lactating and nonlactating cattle reported in Travis and Arms, 1988).

Notes: mg/kg = milligrams per kilogram.
Log K_{ow} = logarithmic expression of the octanol-water partition coefficient.
< = less than.
kg = kilogram.

each of the surface soil ECPCs evaluated at Site 13 are included in Table G-1 of Appendix G.

7.4.3 Terrestrial Plants and Invertebrates Terrestrial plants and invertebrates may be exposed to ECPCs via direct contact with and root uptake (plants) or ingestion (invertebrates) of ECPCs measured in Site 13 surface soil. For the purposes of the Site 13 ERA, exposures to terrestrial plants and invertebrates are assumed to occur within the top one-foot interval of surface soil. Exposure of terrestrial plants to groundwater is not evaluated because the depth to the water table is approximately 40 to 65 feet bls, and thus below the root zone of Site 13 plants (see hydrogeological discussion in Chapter 5.0 of this report).

7.5 ECOLOGICAL EFFECTS ASSESSMENT. The ecological effects assessment discusses what measurement endpoints were used to evaluate potential adverse impacts to the assessment endpoints (i.e., the maintenance of receptor populations). The methods used for identifying and characterizing ecological effects for ECPCs in surface soil are described in the following subsections and in greater detail in Subsection 2.4.4 of the GIR (HLA, 1998).

Wildlife receptors, terrestrial plants, and terrestrial invertebrates are potentially exposed to ECPCs in surface soil at Site 13. The measures of adverse ecological effects for these receptors are discussed separately.

7.5.1 Terrestrial Wildlife As identified in the problem formulation, the assessment endpoint selected for terrestrial wildlife is the survival and maintenance of wildlife populations and communities within the habitat presents at Site 13. Because no long-term wildlife population data are available at NAS Whiting Field, a direct measurement of this assessment endpoint is not possible. The literature-derived results of laboratory toxicity studies are used as a measure of the assessment endpoint. The laboratory toxicity studies relate the dose of a chemical in an oral exposure with an adverse response to growth, reproduction, or survival of a test population (avian or mammalian species). Table G-2 in Appendix G presents literature-derived wildlife ingestion toxicity data.

A reference toxicity value (RTV) is derived for each surface soil ECPC and each representative wildlife species according to the data hierarchy presented in *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments*, Interim Final Draft (USEPA, 1997d). The RTV represents the highest exposure level (e.g., concentration in the diet normalized by dividing by the body-weight) shown to not produce adverse effects (e.g., reduced growth, impaired reproduction, increased mortality). For each ECPC, two RTVs representing lethal and sublethal effects are selected for each representative wildlife species. Lethal effects are those resulting in mortality while sublethal effects include those impairing or preventing reproduction or growth. The RTVs are assumed to be a measure of the assessment endpoints for the protection of the survival, growth, and reproduction of terrestrial wildlife populations. Lethal RTVs are developed using the data hierarchy discussed in

items 1, 2, and 3, while sublethal RTVs are derived using the methodology discussed in items 1 and 2:

1. For contaminants with well-documented adverse effects, the highest exposure level not resulting in significant adverse effects (i.e., a no observable adverse effect level [NOAEL]) was selected as the RTV).

2. Generally one-tenth of the lowest observed adverse effect level (LOAEL) was selected as the RTV for analytes lacking NOAEL values. However, application of the 10-fold uncertainty factor was based on consideration of the exposure duration, type of toxicity test, and the relationship between the selected measurement and assessment endpoints.

3. The lowest reported oral lethal dose to 50 percent of test population (LD_{50}) (oral dose [in mg/kg body weight-day] lethal to 50 percent of a test population) was used to derive the lethal RTV if NOAEL or LOAEL values (based on lethal effects) were not available. The lethal RTV is one-fifth of the lowest reported LD_{50} value for the species most closely related to the representative wildlife receptor. One-fifth of an oral LD_{50} value is considered to be protective against lethal effects for 99.9 percent of individuals in a test population (USEPA, 1986). An assumption is made that the value represented by one-fifth of an oral LD_{50} would be protective of 99.9 percent of the individuals within the terrestrial wildlife populations and represents a level of acceptable risk.

A summary of lethal and sublethal RTVs selected from the ingestion toxicity data is provided in Table G-3 of Appendix G.

If neither lethal nor sublethal toxicity information is available for a taxonomic group, no RTV is identified and risks associated with the respective ECPC are not quantitatively evaluated. However, the absence of specific data for a taxonomic group does not imply there is no toxicological effect associated with contaminant exposure by these receptors; therefore, potential risks to these taxonomic groups are qualitatively discussed in Section 7.7.

7.5.2 Terrestrial Plants and Invertebrates The assessment endpoints selected for terrestrial plants and soil invertebrates at Site 13 are reduction in the biomass of terrestrial plants and abundance of soil invertebrates used as forage material. Site-specific toxicity data for plants and invertebrates are not available; therefore, the results of toxicity studies from the literature relating the soil concentrations of a contaminant with adverse effects to growth, reproduction, or survival of a test population are used as a measure of the assessment endpoint. These study results are summarized for each ECPC in Appendix G, Tables G-4 (plants) and G-5 (invertebrates).

7.6 RISK CHARACTERIZATION. This section presents the risk characterization for potential ecological receptors exposed to surface soil at Site 13. Potential risks associated with exposures to ECPCs in surface soil at Site 13 are discussed separately for wildlife, terrestrial plants, and soil invertebrates. Risks to wildlife are characterized by comparing the PDE concentrations (based on RME and CT exposure concentrations) for each surface soil ECPC with its respective RTV (estimated threshold dose for toxicity). Risks for terrestrial plants and soil

invertebrates are evaluated by comparing toxicity benchmarks to RME and CT exposure concentrations.

7.6.1 Terrestrial Wildlife Risks for the representative wildlife species associated with ingestion and bioaccumulation of ECPCs in surface soil and prey items are quantitatively evaluated using HQs. HQs are calculated for each ECPC by dividing the PDE concentration by the selected lethal and sublethal RTV. HIs are determined for each receptor by summing the HQs for all ECPCs. When the estimated PDE is less than the RTV (i.e., the HQ less than 1), it is assumed chemical exposures are not associated with adverse effects to receptors and risks to wildlife populations are unlikely to be significant. For instance, if the PDE calculated using the RME exposure concentration is less than the lethal RTV, then it is assumed adverse effects to the survival of wildlife populations are unlikely to occur. Similarly, if the reasonable maximum PDE is less than the sublethal RTV, then it is assumed adverse effects to wildlife populations related to growth and reproduction are unlikely to occur. When an HI is greater than 1, a discussion of the ecological significance of the HQs comprising the HI is completed and risks from exposure to CT concentrations of ECPCs are evaluated.

This hazard ranking scheme evaluates potential ecological effects to individual organisms and does not evaluate potential populationwide effects. Contaminants may cause population reductions by affecting birth and mortality rates, immigration, and emigration (USEPA, 1989d). In many circumstances, lethal or sublethal effects may occur to individual organisms with little population- or community-level impacts. However, as the number of individual organisms experiencing toxic effects increases, the probability that population effects will occur also increases. The number of affected individuals in a population presumably increases with increasing HQ or HI values; therefore, the likelihood of population-level effects occurring is generally expected to increase with higher HQ or HI values.

The lethal and sublethal HQs and HIs are calculated for each ECPC and each representative wildlife species. Tables G-7 through G-12 of Appendix G present the HQ and HI calculations for surface soil at Site 13. A summary of risks to representative wildlife receptors exposed to ECPCs at Site 13 is provided in Table 7-7.

Lethal effect HIs are less than 1 for all representative wildlife species exposed to RME concentrations of ECPCs in Site 13 surface soil; therefore, lethal risks are not predicted for these receptors (i.e., bioaccumulating chemicals are not sufficiently high to reduce survivability in terrestrial wildlife populations at Site 13).

Sublethal effect HIs for the cotton mouse, eastern meadowlark, red fox, and great-horned owl are less than 1. Therefore, no growth or reproduction effects are anticipated from exposure to Site 13 surface soil for these receptors. The sublethal HI for the short-tailed shrew is greater than 1 based on both RME and CT exposure concentrations (RME HI of 1.6 and CT HI of 1.1). The primary contributor to the sublethal HI for the short-tailed shrew is aluminum. However, because the RME and CT HI values only slightly exceed 1, population-level sublethal impacts to the short-tailed shrew are unlikely.

Table 7-7
Summary of Hazardous Indices for Terrestrial Wildlife[1]
Associated with Exposure to Site 13 Surface Soil

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Ecological Receptors	Lethal Effects from Exposure to Reasonable Maximum EPCs	Sublethal Effects from Exposure to Reasonable Maximum EPCs	Sublethal Effects from Exposure to Central Tendency EPCs
Cotton mouse	0.19	0.37	0.23
Eastern meadowlark	0.044	0.76	0.54
Short-tailed shrew	0.94	1.6	1.1
Red fox	0.0032	0.0054	0.0036
Great-horned owl	0.0012	0.022	0.015

[1] Hazard indices are presented in Tables D-6 through D-11 in Appendix D.

Note: EPC = exposure point concentration.

7.6.2 Terrestrial Plants Risks for terrestrial plants at Site 13 are evaluated by comparing the selected phytotoxicity RTVs to the RME and CT exposure concentrations. Table 7-8 presents the phytotoxicity RTVs and the RME and CT exposure concentrations for ECPCs selected for Site 13 surface soil.

Although RME and CT exposure concentrations of aluminum, chromium, and vanadium exceed their respective phytotoxicity benchmarks, the vegetative covering at Site 13 is consistent with recolonization of a disturbed area and does not show stressed vegetation typical of inorganic disposal. In addition, the RME concentration of aluminum (22,026 mg/kg) is less than the average aluminum concentration reported for surface soil in the eastern United States (33,000 mg/kg) (U.S. Geological Survey, 1984). The RME concentration of chromium (24.2 mg/kg) is also consistent with background surface soil chromium concentrations reported for the eastern United States (33 mg/kg).The RME concentration of vanadium (43.8 mg/kg) is also consistent with background surface soil vanadium concentrations reported for the eastern United States (43 mg/kg). Therefore, it is unlikely the assessment endpoint including plant biomass and/or plant cover availability would be reduced such that small mammal and bird populations would be affected at Site 13.

7.6.3 Terrestrial Invertebrates Risks for terrestrial invertebrates at Site 13 are evaluated by comparing invertebrate toxicity benchmark values to RME and CT exposure concentrations. Table 7-8 presents the invertebrate RTVs and the RME and CT concentrations for Site 13 surface soil ECPCs. Invertebrate benchmark values are not available for aluminum, manganese, and vanadium. Therefore, it is not possible to quantitatively evaluate risks to terrestrial invertebrates from exposure to these analytes.

RME concentrations of ECPCs are well below the available invertebrate toxicity benchmark values; therefore, it is unlikely the assessment endpoint including invertebrate biomass and/or abundance would be reduced such that small mammal and bird populations would be affected at Site 13.

Table 7-8
Ecological Risk for Plants and Invertebrates in Surface Soil at Site 13

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Analyte	Exposure Point Concentration[1]		RTV		RTV Exceeded? (by RME/by CT)	
	Reasonable Maximum Exposure	Central Tendency Exposure	Plant[2]	Invertebrate[2]	Plant[3]	Invertebrate[3]
Volatile Organic Compounds (mg/kg)						
Methylene chloride	0.0071	0.006	1,000	150	No/No	No/No
Semivolatile Organic Compounds (mg/kg)						
bis(2-Ethylhexyl)phthalate	0.26	0.189	1,000	478	No/No	No/No
Inorganic Analytes (mg/kg)						
Aluminum	22,026	16,042	50	NA	Yes/Yes	NA
Chromium	24.2	13.9	1	50	Yes/Yes	No/No
Manganese	219	95.5	500	NA	No/No	NA
Vanadium	43.8	30.9	2	NA	Yes/Yes	NA

[1] Exposure point concentrations (EPCs) are presented in Table 7-2. The RME EPCs are equal to the lesser of the maximum detected concentration and the 95 percent upper confidence limit. CT EPCs are equal to the mean of all concentrations. When the mean is greater than the RME EPC, then the RME EPC is used for both the RME and CT concentrations.
[2] Plant and invertebrate RTVs are presented in Appendix G, Tables G-4 and G-5, respectively. Generally, the plant RTVs are the lowest observed effect concentration from among growth studies on plants in solid media. Invertebrate RTVs are the lowest concentration lethal to 50 percent of a test population (14-day soil test on *Eisenia foetida*) from among chemicals in the same chemical class (applies to organic compounds). A conservative factor of 0.2 was applied to invertebrate RTVs; the resultant value should be protective of 99.9 percent of the population from acute effects (Neuhauser et. al., 1986).
[3] Comparison shown is RME EPC to RTV over CT EPC to RTV.

Notes: RTV = reference toxicity value.
RME = reasonable maximum exposure.
CT = central tendency.
mg/kg = milligrams per kilogram.
NA = not available.
= shading indicates exceedances.

7.7 UNCERTAINTY ANALYSIS. The objective of the uncertainty analysis is to discuss the assumptions of the ERA process that may influence the risk assessment results and conclusions. Table 2.5 of the GIR presents several general uncertainties inherent in the risk assessment process (HLA, 1998).

Specific uncertainties associated with exposure to surface soil at Site 13 include the following:

- Risks to avian species may have been underestimated because bioaccumulation and toxicity data for this taxonomic group are generally lacking in the literature. As a result, potential risks associated with several ECPCs in surface soil were not evaluated for avian species. If the toxicological and contaminant transport data obtained from studies conducted on mammals were used to estimate risks to avian species, then risk estimates for birds would be higher. However, there is also uncertainty in assuming the metabolic functions of mammals and birds are similar enough to use intertaxonomic surrogates.

- Risks to adult amphibians and reptiles species were not estimated because bioaccumulation and toxicity data for this taxonomic group are generally lacking in the literature. As a result, potential risks associated with ECPCs are uncertain for these species. Intertaxonomic surrogates were not used to calculate dietary risks to amphibians and reptiles because of the uncertainty associated with extrapolation of data from endothermic to essentially ectothermic species. It is unlikely that these receptors would be adversely affected, based on the few analytes selected as ECPCs. The ECPCs were detected at low concentrations and the site does not provide habitat for the most sensitive juvenile stages.

- Site-specific toxicity data for Site 13 surface soil is not available. Phytotoxicity benchmark values used in the risk assessment were designed for risk screening purposes only and may not be relevant to the specific conditions of the surface soil at Site 13. The conservative nature of these literature values may overestimate the actual risk to terrestrial plants at Site 13. Also, invertebrate benchmark values for several analytes are not available, resulting in an underestimation of risk.

- The risks to terrestrial wildlife may have been underestimated because the dermal absorption and inhalation pathways were not quantitatively evaluated. However, risks associated with these pathways would likely be negligible based on the type and magnitude of ECPCs at the Site.

- Risks to small mammals may have been underestimated because the plant BAFs used in the food web model to estimate dietary exposure due to plant consumption were derived assuming a water content in plants of 80 percent (based on berries and the leafy portions of plants). However, grains generally have a water content of approximately 10 percent, and the BAFs used on the ERA may underestimate exposures that graminivorous animals experience. Although, recalculating the BAF using a water content of 10 percent does not significantly change the BAF and therefore risks would also not change significantly.

7.8 SUMMARY OF ECOLOGICAL ASSESSMENT FOR SITE 13. Potential risks to ecological receptors including terrestrial wildlife, terrestrial plants, and soil invertebrates were evaluated for ECPCs in surface soil at Site 13.

Risks associated with exposures to ECPCs in Site 13 surface soil were evaluated for terrestrial wildlife based on a model that estimates the amount of contaminant exposure obtained via the diet and incidental ingestion of surface soil. Wildlife risks are evaluated by comparing the estimated doses for wildlife species (mammals and birds) to a reference toxicity dose representing the threshold at which lethal or sublethal effects may occur.

Based on the results of the food web model, lethal risks to terrestrial wildlife populations at Site 13 are not predicted. Although the RME and CT sublethal HIs slightly exceed 1 for the short-tailed shrew, population-level reductions in the growth and reproduction of this species are not expected to occur.

Reduction in terrestrial plant and soil invertebrate biomass used as forage material was evaluated by comparing exposure concentrations for surface soil ECPCs with toxicity benchmarks. Although RME and CT exposure concentration of aluminum, chromium, and vanadium exceed their respective phytobenchmark values, no signs of stressed vegetation have been observed at Site 13. Therefore, reduction of plant biomass used as forage material at Site 13 is not predicted. Reduction in invertebrate biomass used as forage material is also not expected because RME concentrations of all ECPCs was less than available invertebrate toxicity benchmarks.

Risks associated with exposure to ECPCs in Site 13 subsurface soil were evaluated for terrestrial plants and soil invertebrates. Although plant and invertebrate RTVs were lacking for some of the ECPCs detected in subsurface soil, it is unlikely these analytes would pose a threat to ecological receptors at the levels that they were detected. In addition, no signs of stressed vegetation have been observed at Site 13.

In summary, the results of the ERA suggest that risks are not predicted for ecological receptors populations at Site 13.

8.0 CONTAMINANT FATE AND TRANSPORT

This chapter discusses the fate and transport of human health and ecological CPCs detected in soil and groundwater samples at Site 13. Fate, in the context of this chapter, refers to the ultimate disposition of a given CPC following its release into the environment. Transport refers to the mechanism(s) by which a given chemical released into the environment will arrive at its fate. Explanation of the fate and transport of chemicals in the environment can be very complicated or very simple, depending on the physical, chemical, and biological characteristics of the compound or metal considered and the environment into which that compound is released.

Several organic compounds and inorganics were detected in soil and groundwater samples at Site 13. Because of the number of potential chemicals detected and the myriad fate and transport scenarios possible for those chemicals in the media, this discussion will focus only on those chemicals possibly posing adverse risk to human or ecological receptors, as identified in the HHRA (Chapter 6.0 of this report) and the ERA (Chapter 7.0).

The following discussion of contaminant fate and transport is divided into two sections. Section 8.1 discusses potential migration routes of chemicals in the media evaluated and does not focus specifically on media of concern at Site 13. The site-specific persistence, fate, and transport of those compounds found to pose a potential risk to human health or the environment is discussed in Section 8.2.

8.1 POTENTIAL ROUTES OF MIGRATION. Several routes of migration are possible for a contaminant in environmental media: air, soil, surface water, groundwater, and biota. These routes are summarized below.

Air. Gases and particulate material can be transported in the atmosphere. Organic compounds, metals, and metal complexes existing as gases at surface temperature and pressure may disperse or diffuse into the air and particulates may become entrained in air currents and thereby migrate. The extent to which gaseous constituents and particulate material remain airborne is a function of the level of excitation of the air (wind and temperature) and fate processes acting on the constituent and, for particulates, their density. Particulate material as discussed herein consists of organic compounds and inorganic material not otherwise present in a gaseous medium under atmospheric conditions.

Soil. The primary agents of migration acting on soil include wind, rainwater, flowing water, biological activity, and human activity. Wind commonly transports soil in the form of particulate material via saltation, traction, or suspension. Rainwater may cause soil to migrate either by flushing soil particles downward into the subsurface or by entraining soil particles as rainwater becomes overland flow to surface water bodies or other depositional areas. The amount and type of vegetative cover and surface disturbance affects the degree to which wind and water cause soil to migrate. Incidental contact with soil particles by humans, other animals, or even plants may provide a migration route if the soil adheres to the biological agent.

Surface Water. The mechanisms for migration of constituents in surface water are dissolution and suspension. Several organic compounds and metals are soluble in water and may be transported in the aqueous phase. Insoluble organic compounds and elements may be transported in surface water via suspension. The amount of suspended particulate material a given surface water body can hold is largely a function of the water's energy and geometry; as that energy decreases, suspended material will settle and become part of the soil or sediment. Colloidal material may remain in suspension (by electrochemical forces) in water of very low energy (e.g., standing water).

Sediment. Saltation, traction, suspension, biological action, and human action are the primary mechanisms of migration for sediment. Physical, chemical, and biological processes affecting a constituent will determine where and how migration from sediment will occur.

Groundwater. Groundwater is a liquid medium capable of transporting constituents as colloidal forms, as complexes, as pure phase liquids, or as dissolved-phase liquids. Organic compounds and elements generally reach groundwater either by being placed directly into the aquifer (e.g., disposal pits) or by leaching from soil or solid waste to the water table through physical or chemical processes. Groundwater may discharge to the land surface (seeps or springs), surface water bodies, other aquifers, or pumping wells. The migration of constituents via groundwater discharge depends on the chemical and/or physical processes acting upon each individual constituent in the medium to which it is discharged.

Biota. Biota may be considered a medium for migration of certain organic compounds and inorganics. Several compounds and elements are known to accumulate in the tissues of organisms at various levels in the food chain. As these organisms are consumed by other organisms, compounds and elements are accumulated in their tissue and passed on to organisms higher in the food chain. In this manner, contaminants may be transported by biota. Additionally, some organisms disturb bed sediments in streams and rivers. This disturbance can cause organic compounds and elements to be transported downstream as suspended material in surface water.

8.2 CONTAMINANT PERSISTENCE AND FATE. The discussion of contaminant persistence and fate in the environment is divided into three subsections. Subsection 8.2.1 discusses the processes controlling the persistence and fate of organic and inorganic compounds in the environment. Subsection 8.2.2 discusses the primary persistence and fate characteristics of the constituents detected at Sites 9 and 10. Subsection 8.2.3 discusses contaminant transport for Site 13.

8.2.1 Processes The persistence and fate of chemical constituents in the environment depends on various chemical, physical, and biological processes. The predominant processes affecting the environmental persistence and fate of chemical constituents include solubility, photolysis, volatilization, hydrolysis, oxidation, chemical speciation, complexation, precipitation or coprecipitation, cationic exchange, sorption, biodegradation or biotransformation, and bioaccumulation. These processes are briefly summarized below.

Solubility. The solubility of chemical constituents in water is important in assessing their mobility in the environment. This is particularly important for the transport and ultimate fate of chemicals from soil and sediment to water

(i.e., groundwater and/or surface water). Generally for organic compounds, aqueous solubility is a function of molecular size, molecular polarity, temperature, and the presence of other dissolved organic cosolvents. For metals and other inorganic parameters, solubility is generally controlled by chemical speciation, pH, redox potential (Eh), oxygen content, and the presence of dissolved and/or colloidal organic compounds (e.g., humic and fulvic acids) or other inorganic ion species (e.g., hydroxides and sulfates) (USEPA, 1979). Increased solubility is usually directly related to increased environmental mobility with groundwater and/or surface water being the principal transport medium. Therefore, solubility is a significant factor affecting the fate of a compound or element in the water environment.

Photolysis. Many chemical constituents, particularly organic compounds, are susceptible to photolytic degradation either directly or indirectly. Direct photolysis involves a splitting of the chemical compound by light, whereas indirect photolysis occurs when another compound is transformed by light into a reactive species (i.e., usually an hydroxyl radical) reacting with and modifying the original compound. In general, photolysis primarily occurs within the atmosphere, although it may also occur to a limited extent in surface water and/or soil under certain environmental conditions (USEPA, 1979).

Volatilization. Volatilization of organic chemicals from soil or water to the atmosphere is an important pathway for chemicals with high vapor pressures. For organic compounds, volatilization is a function of partial pressure gradients, temperature, and molecular size and is more likely to occur for compounds with low molecular weights. In addition, certain metals such as mercury, arsenic, and lead are capable of undergoing biologically mediated transformation (i.e., alkylation), forming volatile end products. Volatilization is important for the transport of certain chemical constituents from surface soil (i.e., vadose zone), sediment, and surface water and is evaluated using Henry's Law and other associated chemical-specific rate constants.

Hydrolysis. Hydrolysis involves the decomposition of a chemical compound by its reaction with water. The rate of reaction may be promoted by acid (hydronium ion, $[H_3O^+]$) and/or base (hydroxyl ion, $[OH^-]$) compounds. In general, most organic compounds are resistant to hydrolytic reactions unless they contain a functional group (or groups) capable of reacting with water. Metallic compounds, however, generally dissociate readily in water depending upon the aqueous environmental conditions (e.g., pH and ionic strength). For metals, hydrolytic dissociation is an indirect process affecting the primary fate and transport mechanism of aqueous solubility.

Oxidation. The direct oxidation of organic compounds in natural environmental matrices may occur but this is generally a slow, insignificant transformation mechanism of minimal importance (USEPA, 1979). However, some inorganic compounds may be rapidly oxidized under naturally occurring environmental conditions when the surrounding environment changes from anaerobic to aerobic conditions.

Chemical Speciation. Chemical speciation is important primarily for metals possibly existing in multiple forms in the environment, particularly within aqueous matrices. In general, the aqueous speciation of metals depends primarily upon the relative stabilities of individual valence states (which are element-specific), oxygen content, pH and Eh condition, and the presence of available complexing agents and/or other cations and anions (USEPA, 1979). Because various

metallic species exhibit differential aqueous solubilities and differential mobilities within soils and/or sediments, the particular speciation of an individual metal will greatly affect its environmental mobility.

Complexation. For metals, complexation with various ligands is an important process because these complexes may be highly soluble in water. Complexation may, therefore, greatly enhance mobility within environmental matrices, particularly in groundwater and surface water, depending upon the aqueous solubility of the resulting complex. Complexation depends upon numerous factors such as pH, Eh, type and concentration of complexing ligands, and other ions present (USEPA, 1979).

Most metals are capable of forming numerous organic and/or inorganic complexes in the natural environment (USEPA, 1979). Metals may form organo-metallic complexes, especially with naturally occurring organic acids (i.e., humic and fulvic acids). In some cases, these metallic species may exhibit varying affinities for different organic ligands (i.e., mercury and arsenic for amino acids and their derivatives) (USEPA, 1979). Metals may also form metallo-inorganic complexes with inorganic ligands such as carbonate, halogens (usually chlorine), hydroxyl, and sulfate (USEPA, 1979). However, organo-metallic complex formation is usually favored over metallo-inorganic complexes.

Precipitation and Coprecipitation. Both chemical precipitation and coprecipitation are important removal mechanisms, particularly for metals and metallo-cyanides in the environment. Precipitation and/or coprecipitation reactions depend on numerous aqueous environmental conditions such as pH, Eh, organic ligands present, oxygen content, and cationic and anionic species present (USEPA, 1979). Depending on the specific conditions, the removal of aqueous metallic species and metallo-cyanides from groundwater and/or surface water can greatly affect a metal's environmental mobility and, hence, its ultimate fate and transport.

Cation Exchange. Cation exchange is important primarily for metals and other ions that may substitute with other cations of similar charge and size within the lattice structure of clay minerals in soil and/or sediment (USEPA, 1979). This process, therefore, can significantly affect the mobility of an aqueous metal cation by removing it from solution under certain environmental conditions.

Sorption. The sorption of chemical constituents by inorganic particulate matter (i.e., soil or sediment) and organic compounds is an important process affecting mobility in the environment. This process is particularly important for the fate and transport of chemicals from soil or sediment to water (i.e., groundwater and surface water). In general, most metals exhibit a potential for adsorption to inorganic particulate matter and organic compounds (USEPA, 1979). Organic compounds also exhibit sorptive capability, but show greater variability in their ability to sorb to particulate or organic matter. The tendency for organic compounds to sorb to soils or sediment is reflected in their organic carbon partitioning coefficients (K_{oc}). K_{oc} is a measure of relative adsorption potential. The normal range of K_{oc} values is from 1 to 10^7 with higher values indicating greater sorption potential. Actual adsorption is chemical-specific and is largely dependent on the organic content of the soil. The fraction of organic carbon, f_{oc}, in soil multiplied by the K_{oc} is defined as the distribution coefficient, K_d. The K_d is a ratio of the concentration adsorbed to the concentration partitioned to water.

Regardless of chemical class, sorption is a reversible process whereby desorption can be favored over sorption under certain environmental conditions (e.g., low pH for metals). For organic compounds in general, as the molecular weight increases and the aqueous solubility decreases (i.e., low polarity and high hydrophobicity), the sorptive binding affinity increases (i.e., K_{oc} increases). The tendency for chemical constituents to adsorb to inorganic particulate and/or organic compounds is a particularly important process because sorption to soils and/or sediments can effectively reduce a chemical constituent's mobility.

Biodegradation or Biotransformation. Biodegradation is a result of the enzyme-catalyzed transformation of chemicals. Organisms require energy, carbon, and essential nutrients from the environment for their growth and maintenance. In the process, chemicals from the environment will be transformed by enzymes into a form used by the organism. The biodegradation rate is the rate by which contaminants will be degraded. The rate is a function of microbial biomass and a chemical's concentration under given environmental conditions. When a pollutant is introduced into the environment, there is often a lag time before biodegradation begins as the organism generates an enzyme capable of digesting the chemical. Co-metabolism occurs when a pollutant can be biotransformed only in the presence of another compound serving as a carbon and energy source (USEPA, 1979).

Bioaccumulation. Bioconcentration and bioaccumulation data are important when evaluating the impact of chemicals in the aquatic environment. The process is characterized by hydrophobic chemicals that can be partitioned into fat and lipid tissues and inorganic chemicals that can be partitioned into bone marrow. The bioconcentration factor is a measure of the concentration of a chemical in tissue (on a dry-weight basis) divided by the concentration in water, and is a commonly used parameter to quantify bioconcentration (USEPA, 1979). The process is significant because bioaccumulation magnifies up through the food chain.

8.2.2 Persistence and Fate of Site 13 CPCs This section discusses the persistence and fate characteristics for constituents identified in the human health and ecological risk assessments (Chapters 6.0 and 7.0, respectively) as risk drivers. To focus this section on persistence and fate characteristics, only those constituents identified as risk drivers and are above relevant standards will be addressed. These constituents are summarized below by medium for Site 13.

Human Health Assessment Constituents (surface water and sediment do not occur at Site 13)

- Surface soil: aluminum, arsenic, iron, manganese, and vanadium
- Groundwater: trichloroethene, arsenic, iron, and manganese
- Subsurface Soil: arsenic

Ecological Assessment Constituents (surface water and sediment do not occur at Site 13)

- Surface soil: Methylene chloride, BEHP, aluminum, manganese, silver, and vanadium
- Groundwater: none

The fate and persistence characteristics of these constituents is summarized below by analytical fraction.

VOCs. Trichloroethene (TCE) has a relatively high solubility value. Dissolution of trichloroethene in infiltrating rainwater may carry the compound to groundwater. Volatilization may be a significant fate and transport mechanism, as indicated by its relatively high vapor pressure. Neither hydrolysis nor oxidation are significant processes. Direct photolysis does not occur, but trichloroethene may react with hydroxyl radicals. Sorption values are low as well, which means the compound does not readily bind to soil or sediment.

Methylene chloride is highly soluble, so transport via infiltrating rainwater to groundwater is an important transport mechanism. Like trichloroethene, methylene chloride volatilizes readily. Hydrolysis, photolysis, and oxidation are not significant processes for this compound. It has a very low sorption value.

Biodegradation, both aerobic and anaerobic, is a significant process for both trichloroethene and methylene chloride. The speed at which biodegradation occurs is a function of how long the compound has been in the soil or groundwater; the longer the compound is present in the environment, the better adapted the microbes are to enable degradation.

Volatilization is the predominant fate and migration process near the land surface for both VOC compounds of concern detected at Site 13. Once these compounds have migrated below the land surface or to groundwater, biodegradation becomes a potentially significant mechanism (Howard, 1990).

SVOCs. BEHP was the only SVOC of concern detected in media at Site 13. BEHP has a very low solubility, indicating it does not readily dissolve in water. It also has a relatively low vapor pressure, so volatilization is not a significant fate or transport process. Neither photolysis nor hydrolysis are important fate processes for phthalates. BEHP has a very high sorption value, indicating that it will sorb strongly to soil or sediment particles. Biodegradation occurs slowly, but is an important fate and transport mechanism in soil or water media. Both aerobic and anaerobic degradation may occur, but aerobic will proceed more readily. All of these factors suggest BEHP is moderately persistent in the environment.

Inorganics. Inorganics identified as contributing a risk exceeding USEPA and FDEP risk assessment criteria are aluminum, arsenic, iron, manganese, silver, and vanadium. Unlike organics, these elements are persistent because they do not degrade naturally in the environment. Their fate depends on the metabolic and physical or chemical processes prevalent at Site 13. Elevated concentrations of aluminum and iron in groundwater have been observed throughout other sites at NAS Whiting Field as well as background sampling locations. Based on the distribution patterns of these inorganics across the base, and their presence in samples from background locations, the elevated concentrations of aluminum and iron in surface soil and groundwater at Site 13 may be attributable to natural occurrence in the environment rather than waste disposal. However, since aluminum and iron have been detected at concentrations above background, their presence may also be site related.

Aluminum is the third most common element in the environment, though not generally found in elevated concentrations in groundwater. Aluminum is known to

complex readily and high concentrations present in soil and groundwater are generally due to silt-sized particles of aluminum-containing compounds often present as clays or aluminum hydroxides. Complexing and polymerization of the most common valence state of aluminum, Al^{+3}, represents the predominant transport mechanism for aluminum in the environment.

Arsenic has two stable forms in solution in groundwater, arsenate (As^{5+}) and arsenite (As^{3+}). In groundwater with pH ranging from 3 to 7, the monovalent arsenate anion $H_2AsO_4^-$ is the dominant form. Upon entering surface water, via groundwater discharge, arsenic may partition to sediment from solution by hydrous iron oxide adsorption and/or coprecipitation (or a combination of both) with sulfides in the sediment. The Eh and pH conditions of the surface water and sediment govern the effectiveness of these mechanisms (adsorption and co-precipitation) as a sink for arsenic. These mechanisms appear to be the major inorganic factors controlling arsenic concentrations in surface water (Hem, 1992).

Arsenic may be very mobile in the aquatic environment, cycling through the water column, sediment, biota, and air. Most arsenic released into the environment (on the earth's surface) eventually ends up in either sediments (in stream beds or lakes) or in the oceans. Eh and pH conditions largely govern the fate of arsenic (USEPA, 1979).

Iron is the second most abundant element in the environment though dissolved concentrations present in groundwater are generally low. The chemical behavior of iron and its solubility depend upon the oxidation intensity and pH of the environmental system in which it is found. Iron exists in two valence states Fe^{2+} and Fe^{3+}, with the Fe^{2+} or ferrous form the most common form of iron found in solution in the reducing conditions within the groundwater environment. Dissolved iron generally sorbs to sediment and may precipitate as iron hydroxide or may oxidize to form iron oxides and iron oxyhydroxides (USEPA, 1979). Iron also may complex with organic molecules, especially fulvic and humic acids. Aerated or flowing water with a pH in the range of 6.5 to 8.5 should contain little dissolved iron.

Manganese is an essential nutrient, and occurs naturally in the earth's crust and in freshwater and saltwater. It occurs in the Mn^{2+}, Mn^{3+}, Mn^{4+}, Mn^{5+}, Mn^{6+}, and Mn^{7+} valence states, with the $^{2+}$ state the most stable and prevalent. In aquatic systems, manganese chloride and sulfate are important species. Manganese carbonates, oxides, and hydroxides are common mineral forms.

Under acidic conditions, Mn^{2+} is highly soluble. Under high pH conditions, manganese precipitates in the hydroxide form. Sorption to organic material also occurs under higher pH conditions. In general, however, manganese is less likely to adsorb to soil or sediment than other inorganics. As a result, it is generally available for transport. The presence of silicates, hydroxides, and carbonates (common in clayey and sandy soils in Florida) provide a substrate for manganese adsorption, which reduces its solubility. Higher pH conditions also reduce the mobility of manganese (USEPA, 1979).

Silver is relatively rare in the environment, and aquatic concentrations are generally low. Argentite (silver sulfide) is the most common natural mineral form, although silver halides and chlorides occur, and silver complexes with

oxides, carbonates, and phosphates are relatively common. Silver is relatively insoluble in most of these forms.

Silver is readily adsorbed in the presence of oxides of manganese or iron (which are extremely common in the natural environment). It also readily adsorbs to organic materials, tending to concentrate in the finer fractions of soil or sediment (where organic materials are concentrated). Precipitation of silver sulfide may occur under reducing conditions.

Sorption and precipitation are dominant processes affecting the fate of silver in the environment (USEPA, 1979). As a result, silver concentrations are usually greater in sediment or soil than in water media. Elemental silver is quite stable over a wide range of environmental conditions (i.e., Eh and pH).

Vanadium commonly exists in the V^{3+}, V^{4+}, and V^{5+} valence states. Its aqueous chemistry is quite complex, but overall concentrations seem to be controlled more by availability of a vanadium source, rather than equilibrium considerations. Bioconcentration of vanadium by vegetation has been reported by several researchers.

Based on the fate and persistence characteristics of the CPCs, it is expected off-site migration of contaminants would be limited. Furthermore, organic contaminants, such as TCE, would be expected to degrade over time at Site 13 while the inorganics would tend to sorb to soil.

8.2.3 Transport of Contaminants This section discusses the transport of chemicals via surface soil, surface water, sediment, and groundwater at Site 13.

Surface Soil. Transport of the CPCs in soil is dependent on several factors, as discussed in Section 8.1. The primary agents of migration acting on soil include wind, water, and human activity. Soil can also act as a source medium from which the CPCs are transported to other media. Transport of the CPCs from soil via airborne pathways is not expected to be a major transport mechanism because of the heavy vegetation present at Site 13. Vegetative cover is an effective means of limiting airborne migration and erosion of soil. Humans are effective at moving soil and can greatly affect the transport of soil-bound chemicals at hazardous waste sites. Under the current use of Site 13, human activity is not a major transport mechanism for the CPCs in soils. This condition may change based on the future land use of Site 13.

Water can transport soil and CPCs in soil via the mechanisms of overland flow or the leaching of constituents from the soil to groundwater. Soil erosion, the physical transport of soil via surface water runoff, is currently not considered a major mechanism for the transport of the CPCs in soil at Site 13 because of (1) the relatively low grade (slope) of the land surface, (2) the heavy vegetative cover, and (3) the nature of the constituents remaining in the soil.

During the period of reported active disposal at Site 13 (1979 through 1984), the potential for physical transport of both soil and CPCs via runoff could have been a potentially significant mechanism for transport. If pits or trenches were excavated into the soil and waste materials were disposed of in the pits, heavy precipitation events could have moved the unvegetated soil around the low-lying areas. Additionally, the possibility exists that the depressed areas overflowed during heavy rain storms, because they were not covered during operation of the

landfill. The landfill area has subsequently been backfilled following their periods of use, and the area has revegetated. However, the surface of the former landfill area is depressed relative to the surrounding land surface. No significant transport of surface soil is expected since revegetation of Site 13.

The organics (except methylene chloride) and metals detected in the soil at Site 13 are likely to remain attached to the soil because these CPCs have relatively high K_{oc} values and ultimately high soil distribution based on the organic carbon content of site soil. The partitioning behavior explains why the observed constituents remain in the soil at Site 13 and have not leached into the groundwater or washed off site.

Surface Water. There are no permanent surface water bodies present at Site 13. The "Y" ditch flows south and east along the western and southern boundaries of the site, but the ditch is topographically higher than the land surface at Site 13, so it is not a likely receptor for Site 13 contaminants. Standing water does pond periodically in the depression representing the former landfill surface, but the depression is not linked hydraulically to any other surface water feature.

Currently, transport of the CPCs at Site 13 via storm water runoff is considered unlikely due to (1) the gentle slope of the land surface at the site, (2) high infiltration capacity of surface water at the sites (i.e., high soil porosity), (3) heavy vegetation at the site, and (4) tendency of the surface soil contaminants at the site to remain attached to clays or organic materials in the soil.

When Site 13 was an active landfill, transport of contaminants via surface water runoff may have been a significant means of contaminant transport. The landfill was open to rainfall during its operation and it is possible intense rainfall may have caused overflow from the landfill depression. The landfill has been backfilled following closure, and the area has revegetated. However, the surface remains depressed relative to the surrounding land surface.

Sediment. There are no permanent surface water bodies at Site 13, so the only potential sediment transport is within the surface depression of the landfill.

Groundwater. Migration of contaminants via overland flow is dependent on periodic rainfall events. Therefore, the dominant pathway for CPCs to be transported off site is groundwater flow. As discussed in Section 5.7, the observed concentrations of the inorganics in unfiltered groundwater at Site 13 was affected by turbidity in the groundwater samples at the time of collection. The groundwater samples collected in 1996 (during Phase IIB) are thought to be more representative of groundwater conditions at the site. Particulate material of larger than colloidal sizes probably does not easily move through the matrix of the aquifer. Colloid-sized material may be transported through the aquifer matrix at flow rates present in the surficial aquifer system at Site 13.

Hydrogeology at Site 13 is discussed in Section 5.4 of this report. The aquifer present at the site is the surficial (sand and gravel) aquifer. The CPCs identified for groundwater (iron, manganese, TCE, and arsenic) are all associated with the surficial aquifer system. Recharge of the surficial aquifer at Site 9 and 10 occurs primarily by rainfall infiltration on the sites. Groundwater flow direction in the surficial aquifer at Site 9 and 10 is primarily to the southeast, following surface topography (Figure 5-1 and 5-2). The "Y" drainage

ditch borders the site to the west and south and ultimately discharges to Big Coldwater Creek approximately 2 miles east of the site (Figure 1-2).

Horizontal hydraulic gradient estimates have been developed for the Southeast Disposal Area, including Site 13. The gradients were calculated for 14 events between September 1993 and August 1997. An average gradient was calculated for each event (Table 5-2). The average hydraulic gradient in the surficial aquifer in the Southeast Disposal Area (over the 14 measurement events) is 0.0029 ft/ft in a southeast direction.

Vertical hydraulic gradient data were calculated at several well pairs located in the Southeast Disposal Area between September 1993 and August 1997 (Table 5-3). At most locations, during most of the measurement events, vertical gradients were determined to be mostly in an upward direction. This suggests the Southeast Disposal Area may be a groundwater discharge zone.

Hydraulic conductivity testing was completed for the Southeast Disposal Area at monitoring wells WHF-11-3, WHF-13-2S, and WHF-14-2. The geometric mean of the average hydraulic conductivity values for the Southeast Disposal Area is 8.38 ft/day (Table 5-4).

Horizontal groundwater seepage velocity calculations for the surficial aquifer system at the Southeast Disposal Area use available hydraulic information (Section 5.4). The horizontal seepage velocity was calculated by multiplying the hydraulic conductivity (K) by the hydraulic gradient and dividing by the effective porosity as shown in Table 5-5. The average linear pore water velocity (i.e., seepage velocity) for the Southeast Disposal Area sites was calculated to be 0.074 ft/day or 27 ft/yr.

Disposal activities at Site 13 may have begun releasing contaminants to the aquifer approximately 20 years ago. Using a horizontal seepage velocity of 27 ft/yr multiplied by a 20-year time frame, the total horizontal distance of potential contaminant migration is estimated to be approximately 540 feet.

Using the seepage velocity presented above likely overestimates the transport of potential contaminants from the site because it does not account for dilution, advection, dispersion, or adsorption. Dividing either the seepage velocity or the distance by a correction factor of 1.4 (USEPA, 1988b) may provide a more realistic estimate for potential contaminant migration of 386 feet.

The potential contaminant migration of 386 feet is based in part on hydraulic conductivity values derived from slug test data. Slug tests provide a rough estimate of hydraulic conductivity more accurately measured using pumping tests. Slug data may differ from pump test data by up to a factor of ten (Bouwer, 1989). If the hydraulic conductivity value used in the calculation was decreased by an order of magnitude, a total migration of only 39 feet would be expected for the 20-year history of the site.

9.0 CONCLUSIONS AND RECOMMENDATIONS

9.1 CONCLUSIONS. The following conclusions are based on the remedial investigation at Site 13, Sanitary Landfill at NAS Whiting Field:

- Surface soil at Site 13 is moderately permeable, fine-grained clayey sand and silty sand. The shallow subsurface soil (2 to 7 feet bls) contained interbedded sand, silt, and clay layers. The lithology of subsurface soil consists predominantly of silt and sands overlying well graded sands. Stringers of clay and poorly graded sands were common throughout the area. A clay layer of significant thickness (greater than 4 feet) and areal extent appears to exist within the Southeast Disposal Areas. The layer is 15 to 25 feet thick and is located between 75 and 50 feet above sea level. The clay layer was not identified in the boring for monitoring well WHF-13-1S, indicating the layer may be discontinuous at Site 13

- A geophysical survey indicated the approximate lateral boundaries of the sanitary landfill at Site 13. The landfill consists of three primary, north-south trending trenches occupying a combined area of approximately 1,750 feet by 250 feet. Several additional isolated geophysical anomalies were identified in the southwest quadrant of Site 13, west of the main landfill boundaries. The isolated anomalies are interpreted to represent buried ferromagnetic materials.

- Ten TAL metals (aluminum, arsenic, barium, calcium, chromium, iron, manganese, silver, vanadium, and zinc) were detected in surface soil samples at concentrations exceeding their respective background screening values. Detected concentrations of aluminum, arsenic, iron, and vanadium exceeded residential standards for USEPA Region III RBCs. Concentrations of arsenic also exceeded the industrial standards for the USEPA Region III RBCs and residential and industrial standards for the soil cleanup goals for Florida.

- Mercury, phenol, and 4-methylphenol were detected in subsurface soil at concentrations above the soil leachability cleanup target levels for Florida. These exceedances will be addressed in the Site 40 basewide groundwater investigation.

- Four TAL metals (arsenic, cyanide, mercury, and sodium) were detected in subsurface soil samples at concentrations exceeding their respective background screening values. Arsenic was detected at concentrations exceeding residential and industrial standards for soil cleanup goals for Florida and the USEPA Region III RBCs.

- TCE was detected in Phase II groundwater samples at concentrations exceeding the Federal MCL of 0.5 $\mu g/\ell$ and the Florida groundwater guidance concentration of 3 $\mu g/\ell$.

- Nine TAL analytes (arsenic, barium, calcium, iron, lead, magnesium, manganese, sodium, and zinc) were detected at concentrations exceeding their respective background screening values in groundwater samples collected at Site 13. Three analytes (aluminum, iron, and manganese)

were present at concentrations exceeding their respective Federal MCLs and Florida groundwater guidance concentrations.

- The water table is approximately 40 to 65 feet bls at the site. The groundwater flow direction is southeast across the site. The average horizontal seepage velocity for the Southeast Disposal Area sites was approximately 27 ft/yr.

- Groundwater is the dominant transport pathway for migration of CPCs off site. Based on an average horizontal seepage velocity of 27 ft/yr and the 20-year site history, the maximum migration distance for CPCs is estimated to be 540 feet. Incorporation of correction factors for dispersion and uncertainty of slug test data results may reduce the migration distance to approximately 39 feet. Analytical groundwater data from downgradient monitoring wells do not indicate chemicals are migrating from the site.

- The total ELCR at Site 13 (1×10^{-5}), associated with exposure to soil by a hypothetical future resident, exceeded Florida's target risk level of concern (1×10^{-6}) due to arsenic, and therefore may pose an unacceptable risk. This risk may be due to naturally occurring levels of arsenic.

- Exposure to subsurface soils at Site 13 does not pose an unacceptable risk based on USEPA and Florida target risk limits. The arsenic EPC does exceed Florida's soil cleanup goal for an industrial site. This risk may be due to naturally occurring levels of arsenic in Florida.

- The background levels of arsenic at Site 13 exceed Florida residential soil cleanup goals and may result in an unacceptable carcinogenic risk. It is likely naturally occurring arsenic contributes to the FDEP target risk-level exceedance.

- Groundwater at Site 13 may pose an unacceptable risk to hypothetical future residents (ELCR is 3×10^{-5}) due to arsenic. Although this value exceeds Florida's target risk level for arsenic; the EPC for arsenic is an order of magnitude less than both the Federal drinking water standard and Florida's groundwater guidance concentration.

- Surface soil was the only medium evaluated for ecological receptors.

- No lethal risks are predicted for any of the representative wildlife species at Site 13.

- No potential effects on growth or reproduction in the cotton mouse, red fox, or birds are expected as a result of exposure to surface soil.

- Direct and indirect ingestion of surface soil by the short-tailed shrew may result in a potential sublethal risk such as reduction in growth or reproduction at the individual level, but no adverse effects are predicted at the population level. Sublethal effects in this species are related primarily to aluminum concentrations in surface soil.

- For terrestrial plants, exposure concentrations of aluminum and vanadium exceed their respective phytotoxicity benchmark values.

However, the RME value for both of these inorganics are consistent with published regional background values. In addition, the vegetative covering at Site 13 is consistent with recolonization of a disturbed area, with no sign of stress consistent with inorganics. Therefore, plant biomass used as forage and plant cover are not expected to be reduced enough to affect the bird and small mammal populations at Site 13.

- RMEs of all ECPCs are well below their corresponding invertebrate toxicity benchmark values. No potential effects on the small mammal and bird populations are expected as a result of impacts to invertebrates used as forage material.

9.2 RECOMMENDATIONS. Based on the interpretation of findings from the remedial investigation activities, a FS is recommended for Site 13, Sanitary Landfill, to address the presence of arsenic in the surface soils. Although groundwater analytical results, summaries and conclusions are included in this RI report, the groundwater at NAS Whiting Field has been designated as a separate site (Site 40, Facilitywide Groundwater). Therefore, chemicals in the groundwater that pose a threat to human and ecological receptors will be evaluated as part of the Site 40 RI/FS. Subsurface soil samples with concentrations exceeding Florida leachability cleanup target levels will also be evaluated in the Site 40 RI/FS. The Site 40 assessment will supersede the evaluation presented in this report.

10.0 PROFESSIONAL REVIEW CERTIFICATION

The work and professional opinions rendered in this report were conducted and developed in accordance with commonly accepted procedures and protocols consistent with applied standards of practice. This report is based on the geologic investigation and associated information detailed in the text and appended to this report. If conditions are discovered or determined to exist differing from those described, the undersigned geologist should be notified to evaluate the effects of any additional information on the assessment described in this report. The remedial investigation for Site 13, Sanitary Landfill, was developed for NAS Whiting Field in Milton, Florida, and should not be construed to apply for any other purpose or to any other site.

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APPENDIX A

GEOPHYSICS

3.2.4 Site 13 - Sanitary Landfill

3.2.4.1 General

Site 13 is located on the eastern property line of south field, and a road runs N-S along the long axis of the site. The geophysical survey location map for site 13 is shown in Figure 3-18.

A twenty foot line spacing was used on the lines from 0N to 1200N, and line spacing of 40 ft was used from 120S to 0N and 1200N to 1800N. This site is mostly open, with the exception of the area between 200W to 400W, 80N to 240N, which was covered with slash pines.

3.2.4.2 Magnetics

The total magnetic field data is presented in Figure 3-19. The data shows two linear features which trend roughly N-S from approximately 80S to 1660N, with a shorter parallel feature between 700N to 1100N.

The anomaly of the greatest magnitude at this site lies between 100N to 180N, and 270W to 200W. The magnetic signatures indicate that this anomaly contains a significant amount of ferromagnetic material. To the north and west of this are other high magnitude magnetic anomalies. At 30E, 1720N there is an isolated magnetic high.

During the surveying of the magnetic data, a vehicle was stuck in the mud at 0W, 460N and is apparent on the magnetic data set.

3.2.4.3 EM Induction Data

The conductivity data (Fig. 3-20) shows a linear conductivity high running from approximately 80S to 1640N along 40W. Another ridge of high conductivity parallels this to the west from 740N to 1200N. The area between 80N to 240N, and 200W to 400W, shows scattered localized anomalies. The in-phase data set for site 13 (Fig. 3-21) shows in-phase anomalies consistent with those of the conductivity data.

3.2.4.4 Results

The interpreted landfill boundary is shown in Figure 3-18. The landfill appears to be a series of filled trenches approximately 1,750 ft long, and approximately 250 ft wide at its widest point.

In the area between 80N to 240N and 20W to 400W, there are high amplitude magnetic anomalies. In this same area, the conductivities appear to be close to that of background. Where there are conductivity anomalies, there are also in-phase anomalies, which indicates that changes in conductivity are likely to be caused by buried metallics. The general character of the conductivity and magnetic signatures in this area leads to the interpretation that large amounts of ferromagnetic metals were buried in this area. The greatest concentration of ferromagnetic metals in this area is interpreted to lie along line 140N between 270W and 230W. An anomaly at 30E, 1720N is present on both magnetic and conductivity data sets, and is believed to be caused by buried metals.

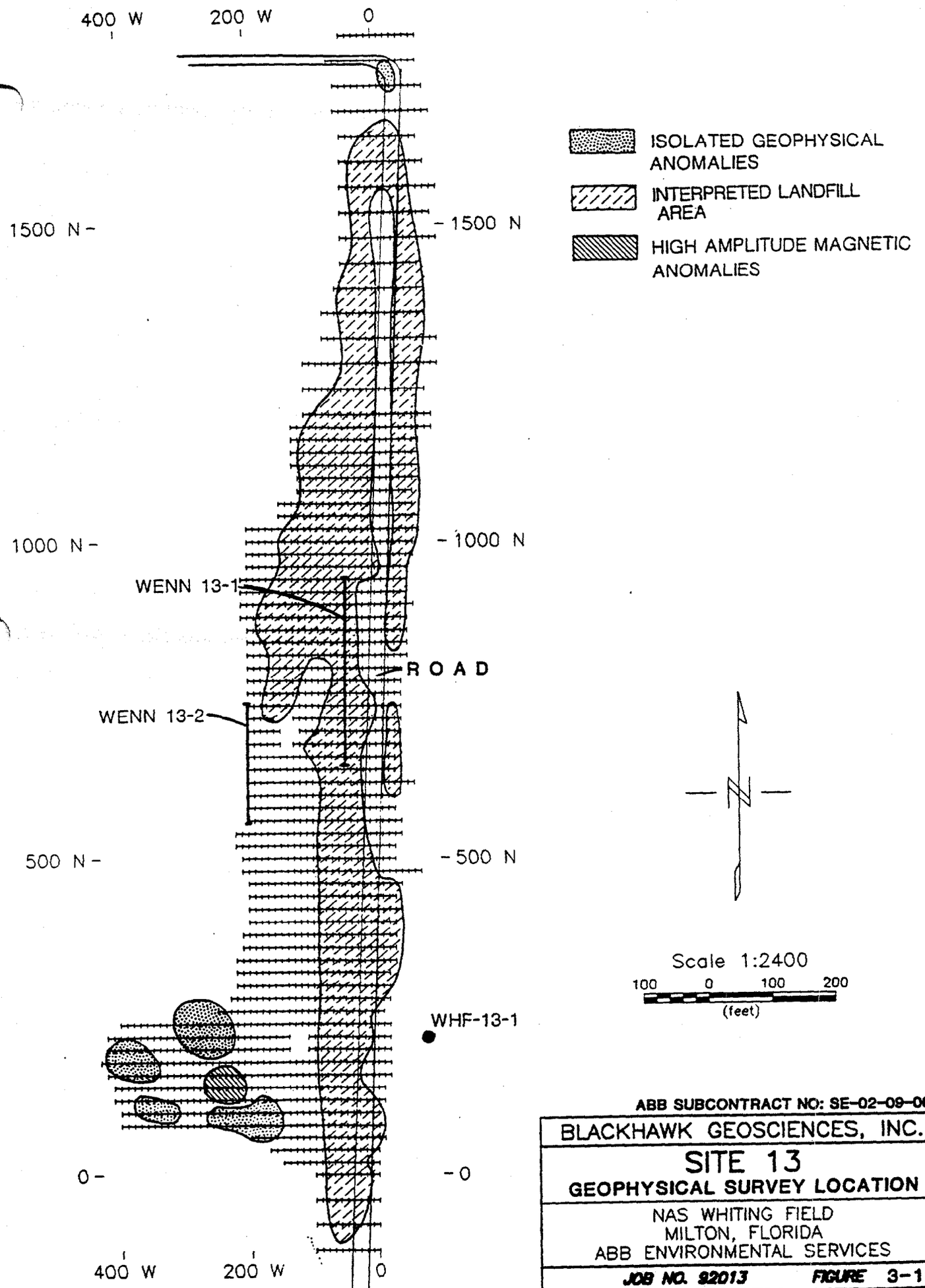


ABB SUBCONTRACT NO: SE-02-09-001

BLACKHAWK GEOSCIENCES, INC.

SITE 13

GEOPHYSICAL SURVEY LOCATION

NAS WHITING FIELD
MILTON, FLORIDA
ABB ENVIRONMENTAL SERVICES

JOB NO. 92013 FIGURE 3-18

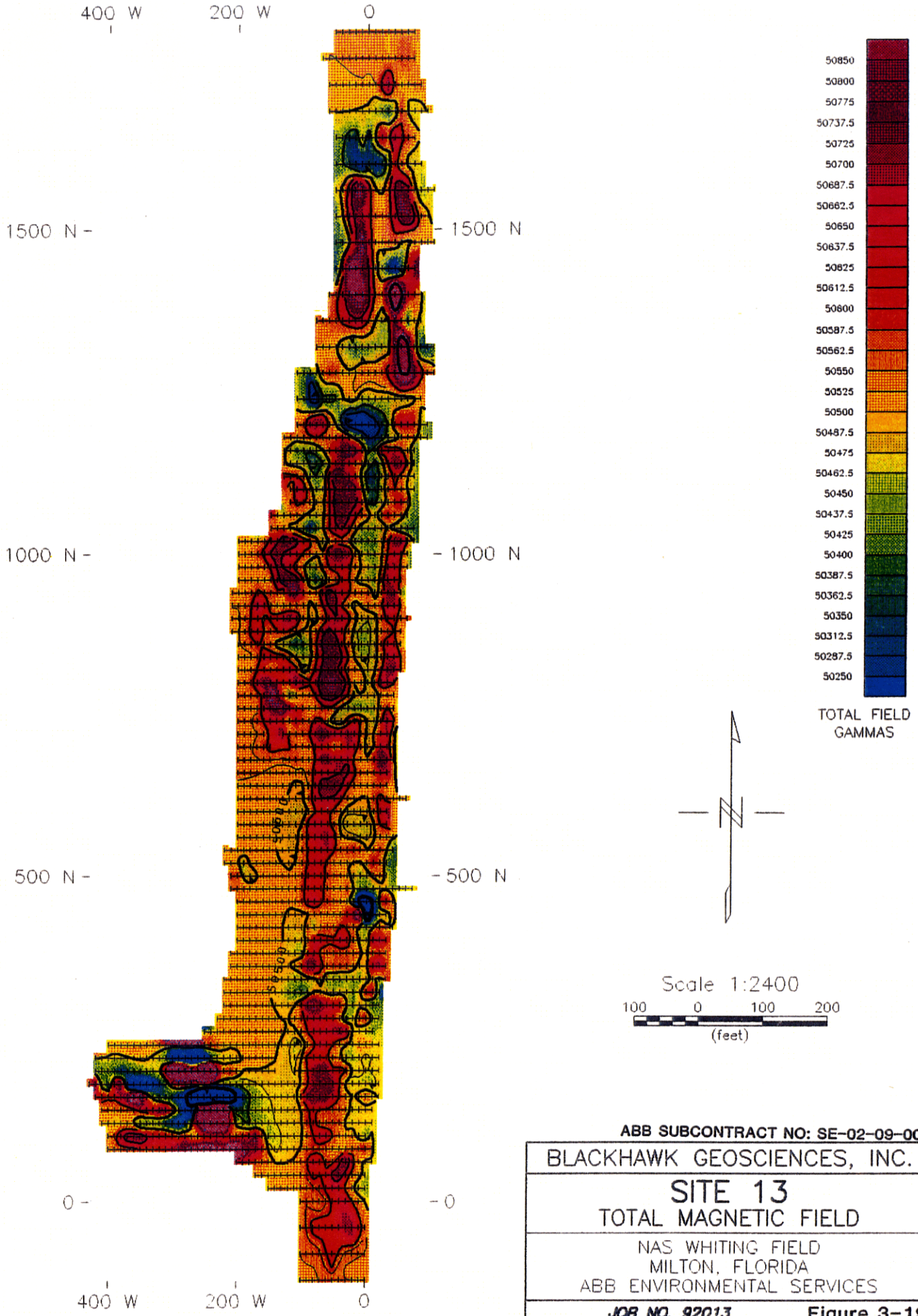


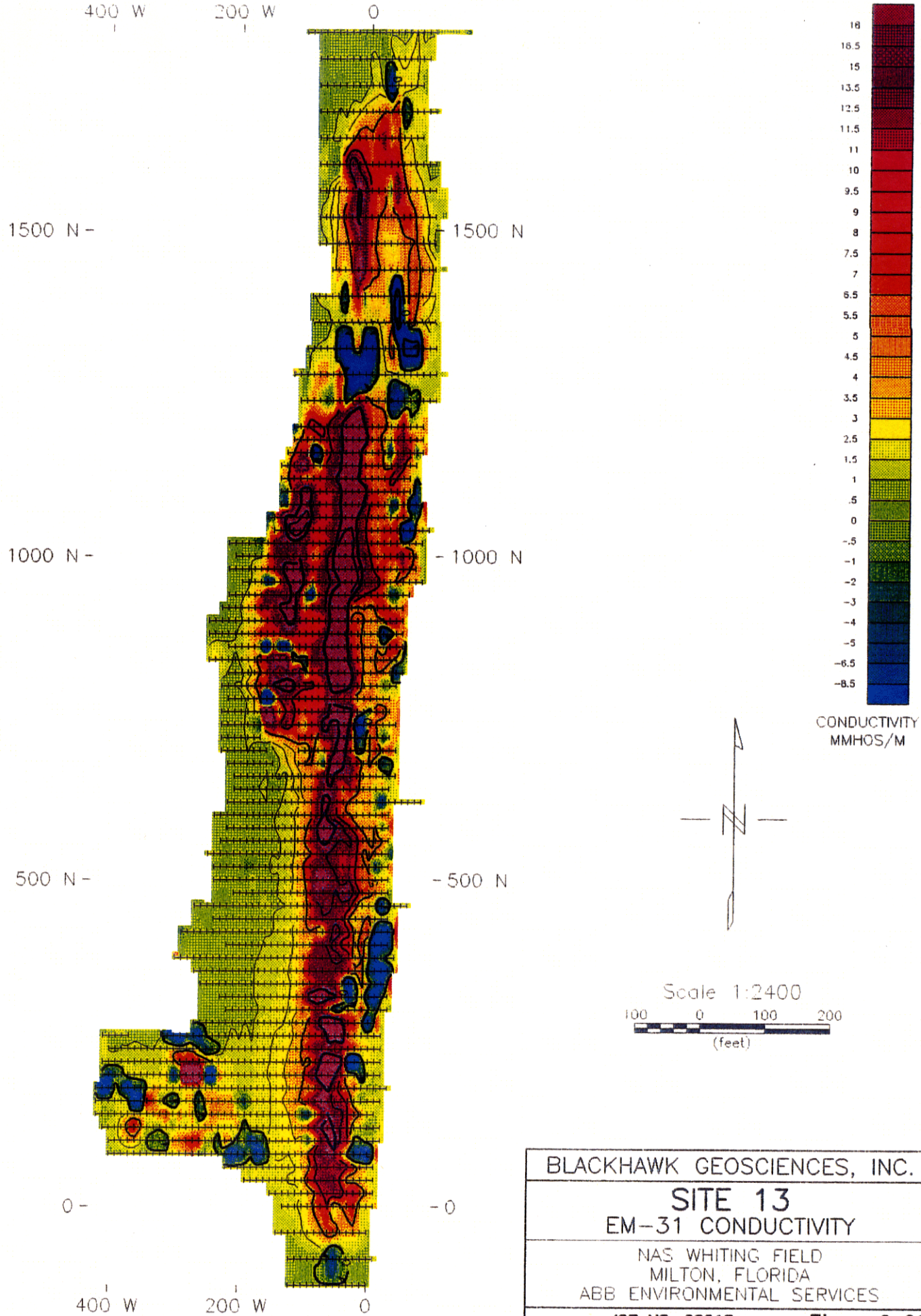
ABB SUBCONTRACT NO: SE-02-09-001

BLACKHAWK GEOSCIENCES, INC.

SITE 13
TOTAL MAGNETIC FIELD

NAS WHITING FIELD
MILTON, FLORIDA
ABB ENVIRONMENTAL SERVICES

JOB NO. 92013 Figure 3-19

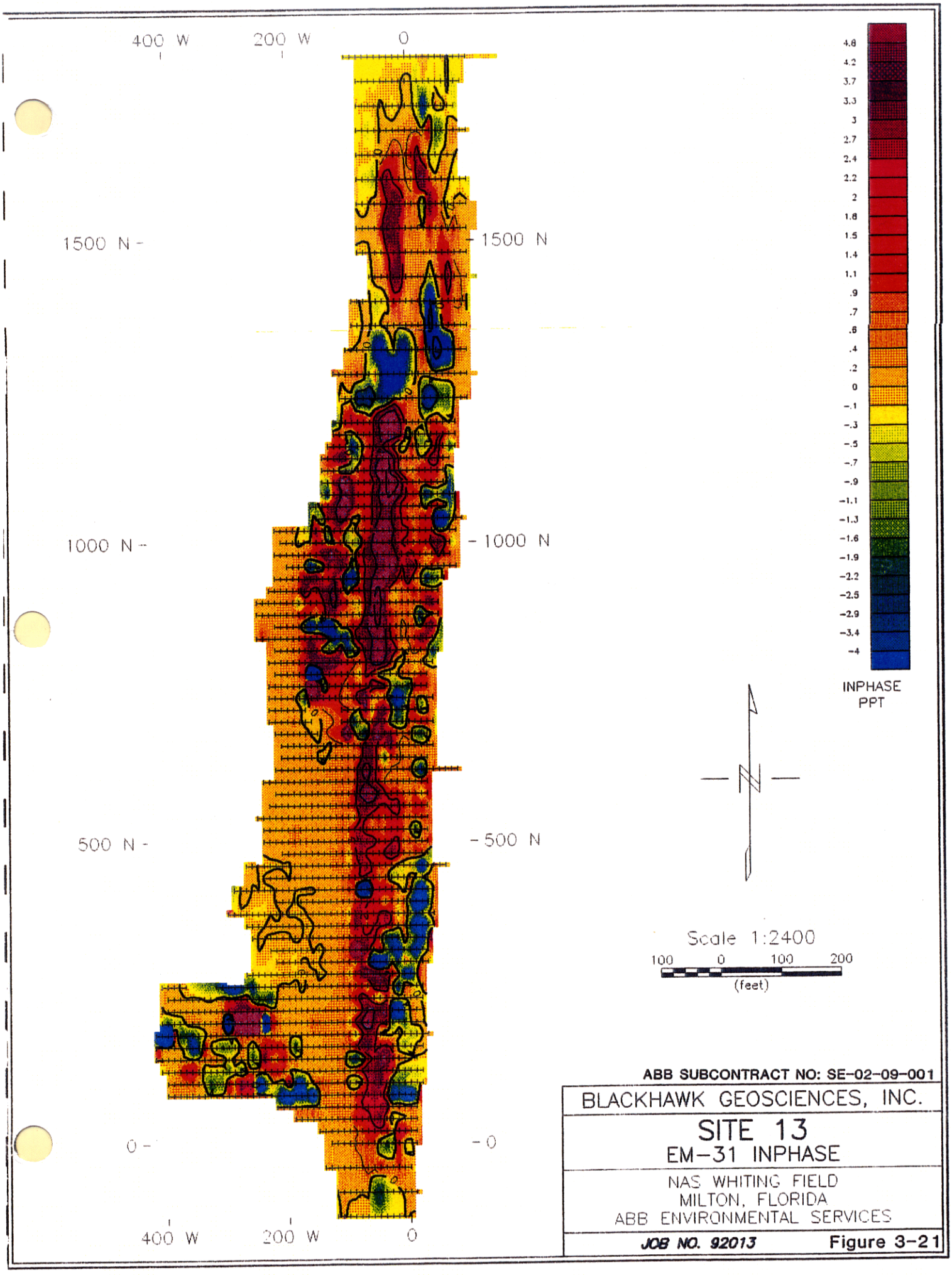


BLACKHAWK GEOSCIENCES, INC.

SITE 13
EM-31 CONDUCTIVITY

NAS WHITING FIELD
MILTON, FLORIDA
ABB ENVIRONMENTAL SERVICES

JOB NO. 92013 Figure 3-20


400 W
200 W
0
1500 N
1000 N
500 N
0
4.8
4.2
3.7
3.3
3
2.7
2.4
2.2
2
1.8
1.5
1.4
1.1
.9
.7
.6
.4
.2
0
-.1
-.3
-.5
-.7
-.9
-1.1
-1.3
-1.6
-1.9
-2.2
-2.5
-2.9
-3.4
-4
INPHASE
PPT
Scale 1:2400
100 0 100 200
(feet)
ABB SUBCONTRACT NO: SE-02-09-001
BLACKHAWK GEOSCIENCES, INC.
SITE 13
EM-31 INPHASE
NAS WHITING FIELD
MILTON, FLORIDA
ABB ENVIRONMENTAL SERVICES
JOB NO. 92013
Figure 3-21

APPENDIX B

SOIL ANALYTICAL DATA

Naval Air Station Whiting Field, Milton, Florida
Site 13 Subsurface Soil Data

Lab Sample Number:		22927002				22927003				22927005				22927006			
Site		WHITING				WHITING				WHITING				WHITING			
Locator		13SS0201				13SS0302				13SS0503				13SS0503A			
Collect Date:		06-OCT-92				06-OCT-92				06-OCT-92				06-OCT-92			
		VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW	ug/kg																
Chloromethane		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
Bromomethane		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
Vinyl chloride		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
Chloroethane		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
Methylene chloride		13	UJ	ug/kg	13	11	UJ	ug/kg	11	56	UJ	ug/kg	56	31	UJ	ug/kg	31
Acetone		86	J	ug/kg	13	67	J	ug/kg	11	700	J	ug/kg	56	580	J	ug/kg	31
Carbon disulfide		13	U	ug/kg	13	2	J	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
1,1-Dichloroethene		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
1,1-Dichloroethane		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
1,2-Dichloroethene (total)		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
Chloroform		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
1,2-Dichloroethane		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
2-Butanone		13	U	ug/kg	13	11	U	ug/kg	11	270		ug/kg	56	270		ug/kg	31
1,1,1-Trichloroethane		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
Carbon tetrachloride		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
Bromodichloromethane		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
1,2-Dichloropropane		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
cis-1,3-Dichloropropene		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
Trichloroethene		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
Dibromochloromethane		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
1,1,2-Trichloroethane		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
Benzene		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
trans-1,3-Dichloropropene		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
Bromoform		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
4-Methyl-2-pentanone		13	U	ug/kg	13	11	U	ug/kg	11	27	J	ug/kg	56	34		ug/kg	31
2-Hexanone		13	U	ug/kg	13	3	J	ug/kg	11	56	U	ug/kg	56	19	J	ug/kg	31
Tetrachloroethene		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
Toluene		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	10	J	ug/kg	31
1,1,2,2-Tetrachloroethane		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
Chlorobenzene		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
Ethylbenzene		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
Styrene		13	U	ug/kg	13	11	U	ug/kg	11	56	U	ug/kg	56	31	U	ug/kg	31
Xylenes (total)		2	J	ug/kg	13	2	J	ug/kg	11	56	U	ug/kg	56	12	J	ug/kg	31
CLP SEMIVOLATILES 90-SOW	ug/kg																
Phenol		430	U	ug/kg	430	380	U	ug/kg	380	130	J	ug/kg	370	130	J	ug/kg	410
bis(2-Chloroethyl) ether		430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
2-Chlorophenol		430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
1,3-Dichlorobenzene		430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
1,4-Dichlorobenzene		430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
1,2-Dichlorobenzene		430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
2-Methylphenol		430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
2,2-oxybis(1-Chloropropane)		430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
4-Methylphenol		430	U	ug/kg	430	68	J	ug/kg	380	1200		ug/kg	370	990		ug/kg	410
N-Nitroso-di-n-propylamine		430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
Hexachloroethane		430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
Nitrobenzene		430	UJ	ug/kg	430	380	UJ	ug/kg	380	370	UJ	ug/kg	370	410	UJ	ug/kg	410
Isophorone		430	UJ	ug/kg	430	380	UJ	ug/kg	380	370	UJ	ug/kg	370	410	UJ	ug/kg	410
2-Nitrophenol		430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
2,4-Dimethylphenol		430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410

Naval Air Station Whiting Field, Milton, Florida
Site 13 Subsurface Soil Data

Lab Sample Number:	22927002				22927003				22927005				22927006			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	13SS0201				13SS0302				13SS0503				13SS0503A			
Collect Date:	06-OCT-92				06-OCT-92				06-OCT-92				06-OCT-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
bis(2-Chloroethoxy) methane	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
2,4-Dichlorophenol	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
1,2,4-Trichlorobenzene	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
Naphthalene	430	U	ug/kg	430	380	U	ug/kg	380	510		ug/kg	370	140	J	ug/kg	410
4-Chloroaniline	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
Hexachlorobutadiene	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
4-Chloro-3-methylphenol	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
2-Methylnaphthalene	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
Hexachlorocyclopentadiene	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
2,4,6-Trichlorophenol	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
2,4,5-Trichlorophenol	1000	U	ug/kg	1000	920	U	ug/kg	920	900	U	ug/kg	900	1000	U	ug/kg	1000
2-Chloronaphthalene	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
2-Nitroaniline	1000	U	ug/kg	1000	920	U	ug/kg	920	900	U	ug/kg	900	1000	U	ug/kg	1000
Dimethylphthalate	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
Acenaphthylene	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
2,6-Dinitrotoluene	430	UJ	ug/kg	430	380	UJ	ug/kg	380	370	UJ	ug/kg	370	410	UJ	ug/kg	410
3-Nitroaniline	1000	U	ug/kg	1000	920	U	ug/kg	920	900	U	ug/kg	900	1000	U	ug/kg	1000
Acenaphthene	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
2,4-Dinitrophenol	1000	UJ	ug/kg	1000	920	UJ	ug/kg	920	900	UJ	ug/kg	900	1000	UJ	ug/kg	1000
4-Nitrophenol	1000	U	ug/kg	1000	920	U	ug/kg	920	900	U	ug/kg	900	1000	U	ug/kg	1000
Dibenzofuran	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
2,4-Dinitrotoluene	430	UJ	ug/kg	430	380	UJ	ug/kg	380	370	UJ	ug/kg	370	410	UJ	ug/kg	410
Diethylphthalate	430	U	ug/kg	430	380	U	ug/kg	380	140	J	ug/kg	370	99	J	ug/kg	410
4-Chlorophenyl-phenylether	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
Fluorene	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
4-Nitroaniline	1000	U	ug/kg	1000	920	U	ug/kg	920	900	U	ug/kg	900	1000	U	ug/kg	1000
4,6-Dinitro-2-methylphenol	1000	U	ug/kg	1000	920	U	ug/kg	920	900	U	ug/kg	900	1000	U	ug/kg	1000
N-Nitrosodiphenylamine	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
4-Bromophenyl-phenylether	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
Hexachlorobenzene	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
Pentachlorophenol	1000	U	ug/kg	1000	920	U	ug/kg	920	900	U	ug/kg	900	1000	U	ug/kg	1000
Phenanthrene	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
Anthracene	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
Carbazole	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
Di-n-butylphthalate	430	UJ	ug/kg	430	380	U	ug/kg	380	370	UJ	ug/kg	370	410	UJ	ug/kg	410
Fluoranthene	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
Pyrene	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
Butylbenzylphthalate	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
3,3-Dichlorobenzidine	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
Benzo (a) anthracene	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
Chrysene	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
bis(2-Ethylhexyl) phthalate	430	UJ	ug/kg	430	430	UJ	ug/kg	380	410	J	ug/kg	370	410	UJ	ug/kg	410
Di-n-octylphthalate	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
Benzo (b) fluoranthene	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
Benzo (k) fluoranthene	430	UJ	ug/kg	430	380	UJ	ug/kg	380	370	UJ	ug/kg	370	410	UJ	ug/kg	410
Benzo (a) pyrene	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
Indeno (1,2,3-cd) pyrene	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
Dibenzo (a,h) anthracene	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
Benzo (g,h,i) perylene	430	U	ug/kg	430	380	U	ug/kg	380	370	U	ug/kg	370	410	U	ug/kg	410
CLP PESTICIDES/PCBS 90-SOW ug/kg																
alpha-BHC	2.2	U	ug/kg	2.2	2	U	ug/kg	2	1.9	U	ug/kg	1.9	2.1	U	ug/kg	2.1

Naval Air Station Whiting Field, Milton, Florida
Site 13 Subsurface Soil Data

Lab Sample Number:	22927002				22927003				22927005				22927006			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	13SS0201				13SS0302				13SS0503				13SS0503A			
Collect Date:	06-OCT-92				06-OCT-92				06-OCT-92				06-OCT-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
beta-BHC	2.2	U	ug/kg	2.2	2	U	ug/kg	2	1.9	U	ug/kg	1.9	2.1	U	ug/kg	2.1
delta-BHC	2.2	U	ug/kg	2.2	2	U	ug/kg	2	1.9	U	ug/kg	1.9	2.1	U	ug/kg	2.1
gamma-BHC (Lindane)	2.2	U	ug/kg	2.2	2	U	ug/kg	2	1.9	U	ug/kg	1.9	2.1	U	ug/kg	2.1
Heptachlor	2.2	U	ug/kg	2.2	2	U	ug/kg	2	1.9	U	ug/kg	1.9	2.1	U	ug/kg	2.1
Aldrin	2.2	U	ug/kg	2.2	2	U	ug/kg	2	1.9	U	ug/kg	1.9	2.1	U	ug/kg	2.1
Heptachlor epoxide	2.2	U	ug/kg	2.2	2	U	ug/kg	2	1.9	U	ug/kg	1.9	2.1	U	ug/kg	2.1
Endosulfan I	2.2	U	ug/kg	2.2	2	U	ug/kg	2	1.9	U	ug/kg	1.9	2.1	U	ug/kg	2.1
Dieldrin	4.3	U	ug/kg	4.3	3.8	U	ug/kg	3.8	3.7	U	ug/kg	3.7	4.1	U	ug/kg	4.1
4,4-DDE	4.3	U	ug/kg	4.3	3.8	U	ug/kg	3.8	3.7	U	ug/kg	3.7	4.1	U	ug/kg	4.1
Endrin	4.3	U	ug/kg	4.3	3.8	U	ug/kg	3.8	3.7	U	ug/kg	3.7	4.1	U	ug/kg	4.1
Endosulfan II	4.3	U	ug/kg	4.3	3.8	U	ug/kg	3.8	3.7	U	ug/kg	3.7	4.1	U	ug/kg	4.1
4,4-DDD	4.3	U	ug/kg	4.3	3.8	U	ug/kg	3.8	3.7	U	ug/kg	3.7	4.1	U	ug/kg	4.1
Endosulfan sulfate	4.3	U	ug/kg	4.3	3.8	U	ug/kg	3.8	3.7	U	ug/kg	3.7	4.1	U	ug/kg	4.1
4,4-DDT	4.3	U	ug/kg	4.3	3.8	U	ug/kg	3.8	3.7	U	ug/kg	3.7	4.1	U	ug/kg	4.1
Methoxychlor	22	U	ug/kg	22	20	U	ug/kg	20	19	U	ug/kg	19	21	U	ug/kg	21
Endrin ketone	4.3	U	ug/kg	4.3	3.8	U	ug/kg	3.8	3.7	U	ug/kg	3.7	4.1	U	ug/kg	4.1
Endrin aldehyde	4.3	U	ug/kg	4.3	3.8	U	ug/kg	3.8	3.7	U	ug/kg	3.7	4.1	U	ug/kg	4.1
alpha-Chlordane	2.2	U	ug/kg	2.2	2	U	ug/kg	2	1.9	U	ug/kg	1.9	2.1	U	ug/kg	2.1
gamma-Chlordane	2.2	U	ug/kg	2.2	2	U	ug/kg	2	1.9	U	ug/kg	1.9	2.1	U	ug/kg	2.1
Toxaphene	220	U	ug/kg	220	200	U	ug/kg	200	190	U	ug/kg	190	210	U	ug/kg	210
Aroclor-1016	43	U	ug/kg	43	38	U	ug/kg	38	37	U	ug/kg	37	41	U	ug/kg	41
Aroclor-1221	87	U	ug/kg	87	77	U	ug/kg	77	75	U	ug/kg	75	84	U	ug/kg	84
Aroclor-1232	43	U	ug/kg	43	38	U	ug/kg	38	37	U	ug/kg	37	41	U	ug/kg	41
Aroclor-1242	43	U	ug/kg	43	38	U	ug/kg	38	37	U	ug/kg	37	41	U	ug/kg	41
Aroclor-1248	43	U	ug/kg	43	38	U	ug/kg	38	37	U	ug/kg	37	41	U	ug/kg	41
Aroclor-1254	43	U	ug/kg	43	38	U	ug/kg	38	37	U	ug/kg	37	41	U	ug/kg	41
Aroclor-1260	43	U	ug/kg	43	38	U	ug/kg	38	37	U	ug/kg	37	41	U	ug/kg	41
CLP METALS AND CYANIDE mg/kg																
Aluminum	23900		mg/kg	40	10700		mg/kg	40	14800		mg/kg	40	11500		mg/kg	40
Antimony	2.9	U	mg/kg	12	2.8	U	mg/kg	12	3.7	J	mg/kg	12	2.9	U	mg/kg	12
Arsenic	6.5		mg/kg	2	4.7		mg/kg	2	4.1		mg/kg	2	3.4		mg/kg	2
Barium	7.5	J	mg/kg	40	6.3	J	mg/kg	40	7.1	J	mg/kg	40	7	J	mg/kg	40
Beryllium	.2	J	mg/kg	1	.16	J	mg/kg	1	.17	J	mg/kg	1	.16	J	mg/kg	1
Cadmium	.69	U	mg/kg	1	.67	U	mg/kg	1	.63	U	mg/kg	1	.64	U	mg/kg	1
Calcium	130	J	mg/kg	1000	151	J	mg/kg	1000	192	J	mg/kg	1000	194	J	mg/kg	1000
Chromium	21		mg/kg	2	15.9		mg/kg	2	17.3		mg/kg	2	16.2		mg/kg	2
Cobalt	1.4	J	mg/kg	10	.75	J	mg/kg	10	1.3	J	mg/kg	10	.63	J	mg/kg	10
Copper	5.8	J	mg/kg	5	3.9	J	mg/kg	5	5	J	mg/kg	5	5.3	J	mg/kg	5
Iron	16200		mg/kg	20	13500		mg/kg	20	15600		mg/kg	20	12200		mg/kg	20
Lead	6		mg/kg	1	5.8		mg/kg	1	4.7		mg/kg	1	5.5		mg/kg	1
Magnesium	97.7	J	mg/kg	1000	73.2	J	mg/kg	1000	74.8	J	mg/kg	1000	72.9	J	mg/kg	1000
Manganese	41.6		mg/kg	3	21.7		mg/kg	3	22.5		mg/kg	3	15.1		mg/kg	3
Mercury	.2	J	mg/kg	.1	.16	J	mg/kg	.1	4.2		mg/kg	.1	.08	J	mg/kg	.1
Nickel	2.1	J	mg/kg	8	1.2	U	mg/kg	8	2.5	U	mg/kg	8	2.5	U	mg/kg	8
Potassium	158	U	mg/kg	1000	154	U	mg/kg	1000	180	J	mg/kg	1000	140	U	mg/kg	1000
Selenium	.49	U	mg/kg	1	.48	U	mg/kg	1	.48	U	mg/kg	1	.49	U	mg/kg	1
Silver	.53	J	mg/kg	2	.5	J	mg/kg	2	.62	J	mg/kg	2	.52	J	mg/kg	2
Sodium	206	J	mg/kg	1000	211	J	mg/kg	1000	206	J	mg/kg	1000	195	J	mg/kg	1000
Thallium	.37	U	mg/kg	2	.36	U	mg/kg	2	.37	U	mg/kg	2	.37	U	mg/kg	2
Vanadium	44.6		mg/kg	10	38.2		mg/kg	10	40.1		mg/kg	10	34.9		mg/kg	10
Zinc	10.2		mg/kg	4	6		mg/kg	4	7.3		mg/kg	4	6.8		mg/kg	4

Naval Air Station Whiting Field, Milton, Florida
Site 13 Subsurface Soil Data

Lab Sample Number:	22927002				22927003				22927005				22927006			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	13SS0201				13SS0302				13SS0503				13SS0503A			
Collect Date:	06-OCT-92				06-OCT-92				06-OCT-92				06-OCT-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Cyanide	.1	U	mg/kg	1	.1	U	mg/kg	1	.1	U	mg/kg	1	.12	J	mg/kg	1
Total petroleum hydrocarbons	-		mg/kg		-		mg/kg		-		mg/kg		-		mg/kg	
Total organic carbon	-		mg/kg		-		mg/kg		-		mg/kg		-		mg/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 13 Surface Soil Data

Lab Sample Number:	22526007				33701007				22526008				33701008			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	13-SL-01				13-SL-01				13-SL-02				13-SL-02			
Collect Date:	18-AUG-92				18-AUG-92				18-AUG-92				18-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW			ug/kg				ug/kg				ug/kg				ug/kg	
Chloromethane	-		ug/kg		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11
Bromomethane	-		ug/kg		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11
Vinyl chloride	-		ug/kg		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11
Chloroethane	-		ug/kg		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11
Methylene chloride	-		ug/kg		15	UJ	ug/kg	5	-		ug/kg		13	UJ	ug/kg	6
Acetone	-		ug/kg		11	UJ	ug/kg	11	-		ug/kg		11	UJ	ug/kg	11
Carbon disulfide	-		ug/kg		5	U	ug/kg	5	-		ug/kg		6	U	ug/kg	6
1,1-Dichloroethene	-		ug/kg		5	U	ug/kg	5	-		ug/kg		6	U	ug/kg	6
1,1-Dichloroethane	-		ug/kg		5	U	ug/kg	5	-		ug/kg		6	U	ug/kg	6
1,2-Dichloroethene (total)	-		ug/kg		5	U	ug/kg	5	-		ug/kg		6	U	ug/kg	6
Chloroform	-		ug/kg		5	U	ug/kg	5	-		ug/kg		6	U	ug/kg	6
1,2-Dichloroethane	-		ug/kg		5	U	ug/kg	5	-		ug/kg		6	U	ug/kg	6
2-Butanone	-		ug/kg		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11
1,1,1-Trichloroethane	-		ug/kg		5	U	ug/kg	5	-		ug/kg		6	U	ug/kg	6
Carbon tetrachloride	-		ug/kg		5	U	ug/kg	5	-		ug/kg		6	U	ug/kg	6
Bromodichloromethane	-		ug/kg		5	U	ug/kg	5	-		ug/kg		6	U	ug/kg	6
1,2-Dichloropropane	-		ug/kg		5	U	ug/kg	5	-		ug/kg		6	U	ug/kg	6
cis-1,3-Dichloropropene	-		ug/kg		5	U	ug/kg	5	-		ug/kg		6	U	ug/kg	6
Trichloroethene	-		ug/kg		5	U	ug/kg	5	-		ug/kg		6	U	ug/kg	6
Dibromochloromethane	-		ug/kg		5	U	ug/kg	5	-		ug/kg		6	U	ug/kg	6
1,1,2-Trichloroethane	-		ug/kg		5	U	ug/kg	5	-		ug/kg		6	U	ug/kg	6
Benzene	-		ug/kg		5	U	ug/kg	5	-		ug/kg		6	U	ug/kg	6
trans-1,3-Dichloropropene	-		ug/kg		5	U	ug/kg	5	-		ug/kg		6	U	ug/kg	6
Bromoform	-		ug/kg		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11
4-Methyl-2-pentanone	-		ug/kg		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11
2-Hexanone	-		ug/kg		5	U	ug/kg	5	-		ug/kg		6	U	ug/kg	6
Tetrachloroethene	-		ug/kg		5	U	ug/kg	5	-		ug/kg		6	U	ug/kg	6
Toluene	-		ug/kg		5	U	ug/kg	5	-		ug/kg		6	U	ug/kg	6
1,1,2,2-Tetrachloroethane	-		ug/kg		5	U	ug/kg	5	-		ug/kg		6	U	ug/kg	6
Chlorobenzene	-		ug/kg		5	U	ug/kg	5	-		ug/kg		6	U	ug/kg	6
Ethylbenzene	-		ug/kg		5	U	ug/kg	5	-		ug/kg		6	U	ug/kg	6
Styrene	-		ug/kg		5	U	ug/kg	5	-		ug/kg		6	U	ug/kg	6
Xylenes (total)	-		ug/kg		5	U	ug/kg	5	-		ug/kg		6	U	ug/kg	6
CLP SEMIVOLATILES 90-SOW			ug/kg				ug/kg				ug/kg				ug/kg	
Phenol	370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
bis(2-Chloroethyl) ether	370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
2-Chlorophenol	370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
1,3-Dichlorobenzene	370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
1,4-Dichlorobenzene	370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
1,2-Dichlorobenzene	370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
2-Methylphenol	370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
2,2-oxybis(1-Chloropropane)	370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
4-Methylphenol	370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
N-Nitroso-di-n-propylamine	370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
Hexachloroethane	370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
Nitrobenzene	370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
Isophorone	370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
2-Nitrophenol	370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
2,4-Dimethylphenol	370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 13 Surface Soil Data

Lab Sample Number:		22526007				33701007				22526008				33701008		
Site		WHITING				WHITING				WHITING				WHITING		
Locator		13-SL-01				13-SL-01				13-SL-02				13-SL-02		
Collect Date:		18-AUG-92				18-AUG-92				18-AUG-92				18-AUG-92		
		VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
bis(2-Chloroethoxy) methane		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
2,4-Dichlorophenol		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
1,2,4-Trichlorobenzene		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
Naphthalene		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
4-Chloroaniline		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
Hexachlorobutadiene		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
4-Chloro-3-methylphenol		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
2-Methylnaphthalene		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
Hexachlorocyclopentadiene		370	UJ	ug/kg	370	-		ug/kg		370	UJ	ug/kg	370	-		ug/kg
2,4,6-Trichlorophenol		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
2,4,5-Trichlorophenol		1800	U	ug/kg	1800	-		ug/kg		1800	U	ug/kg	1800	-		ug/kg
2-Chloronaphthalene		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
2-Nitroaniline		1800	U	ug/kg	1800	-		ug/kg		1800	U	ug/kg	1800	-		ug/kg
Dimethylphthalate		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
Acenaphthylene		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
2,6-Dinitrotoluene		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
3-Nitroaniline		1800	U	ug/kg	1800	-		ug/kg		1800	U	ug/kg	1800	-		ug/kg
Acenaphthene		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
2,4-Dinitrophenol		1800	U	ug/kg	1800	-		ug/kg		1800	U	ug/kg	1800	-		ug/kg
4-Nitrophenol		1800	U	ug/kg	1800	-		ug/kg		1800	U	ug/kg	1800	-		ug/kg
Dibenzofuran		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
2,4-Dinitrotoluene		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
Diethylphthalate		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
4-Chlorophenyl-phenylether		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
Fluorene		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
4-Nitroaniline		1800	U	ug/kg	1800	-		ug/kg		1800	U	ug/kg	1800	-		ug/kg
4,6-Dinitro-2-methylphenol		1800	U	ug/kg	1800	-		ug/kg		1800	U	ug/kg	1800	-		ug/kg
N-Nitrosodiphenylamine		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
4-Bromophenyl-phenylether		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
Hexachlorobenzene		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
Pentachlorophenol		1800	U	ug/kg	1800	-		ug/kg		1800	U	ug/kg	1800	-		ug/kg
Phenanthrene		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
Anthracene		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
Carbazole		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg
Di-n-butylphthalate		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
Fluoranthene		51	J	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
Pyrene		61	J	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
Butylbenzylphthalate		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
3,3-Dichlorobenzidine		730	U	ug/kg	730	-		ug/kg		750	U	ug/kg	750	-		ug/kg
Benzo (a) anthracene		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
Chrysene		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
bis(2-Ethylhexyl) phthalate		95	J	ug/kg	370	-		ug/kg		100	J	ug/kg	380	-		ug/kg
Di-n-octylphthalate		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
Benzo (b) fluoranthene		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
Benzo (k) fluoranthene		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
Benzo (a) pyrene		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
Indeno (1,2,3-cd) pyrene		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
Dibenzo (a,h) anthracene		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
Benzo (g,h,i) perylene		370	U	ug/kg	370	-		ug/kg		370	U	ug/kg	370	-		ug/kg
CLP PESTICIDES/PCBS 90-SOW	ug/kg															
alpha-BHC		8.9	U	ug/kg	8.9	-		ug/kg		9.1	U	ug/kg	9.1	-		ug/kg

Naval Air Station Whiting d, Milton, Florida
Site 13 Surface l Data

Lab Sample Number:	22526007				33701007				22526008				33701008			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	13-SL-01				13-SL-01				13-SL-02				13-SL-02			
Collect Date:	18-AUG-92				18-AUG-92				18-AUG-92				18-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
beta-BHC	8.9	U	ug/kg	8.9	-		ug/kg		9.1	U	ug/kg	9.1	-		ug/kg	
delta-BHC	8.9	U	ug/kg	8.9	-		ug/kg		9.1	U	ug/kg	9.1	-		ug/kg	
gamma-BHC (Lindane)	8.9	U	ug/kg	8.9	-		ug/kg		9.1	U	ug/kg	9.1	-		ug/kg	
Heptachlor	8.9	U	ug/kg	8.9	-		ug/kg		9.1	U	ug/kg	9.1	-		ug/kg	
Aldrin	8.9	U	ug/kg	8.9	-		ug/kg		9.1	U	ug/kg	9.1	-		ug/kg	
Heptachlor epoxide	8.9	U	ug/kg	8.9	-		ug/kg		9.1	U	ug/kg	9.1	-		ug/kg	
Endosulfan I	8.9	U	ug/kg	8.9	-		ug/kg		9.1	U	ug/kg	9.1	-		ug/kg	
Dieldrin	18	U	ug/kg	18	-		ug/kg		18	U	ug/kg	18	-		ug/kg	
4,4-DDE	18	U	ug/kg	18	-		ug/kg		18	U	ug/kg	18	-		ug/kg	
Endrin	18	U	ug/kg	18	-		ug/kg		18	U	ug/kg	18	-		ug/kg	
Endosulfan II	18	U	ug/kg	18	-		ug/kg		18	U	ug/kg	18	-		ug/kg	
4,4-DDD	18	U	ug/kg	18	-		ug/kg		18	U	ug/kg	18	-		ug/kg	
Endosulfan sulfate	18	U	ug/kg	18	-		ug/kg		18	U	ug/kg	18	-		ug/kg	
4,4-DDT	18	U	ug/kg	18	-		ug/kg		18	U	ug/kg	18	-		ug/kg	
Methoxychlor	89	U	ug/kg	89	-		ug/kg		91	U	ug/kg	91	-		ug/kg	
Endrin ketone	18	U	ug/kg	18	-		ug/kg		18	U	ug/kg	18	-		ug/kg	
Endrin aldehyde	-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
alpha-Chlordane	89	U	ug/kg	89	-		ug/kg		91	U	ug/kg	91	-		ug/kg	
gamma-Chlordane	89	U	ug/kg	89	-		ug/kg		91	U	ug/kg	91	-		ug/kg	
Toxaphene	180	U	ug/kg	180	-		ug/kg		180	U	ug/kg	180	-		ug/kg	
Aroclor-1016	89	U	ug/kg	89	-		ug/kg		91	U	ug/kg	91	-		ug/kg	
Aroclor-1221	89	U	ug/kg	89	-		ug/kg		91	U	ug/kg	91	-		ug/kg	
Aroclor-1232	89	U	ug/kg	89	-		ug/kg		91	U	ug/kg	91	-		ug/kg	
Aroclor-1242	89	U	ug/kg	89	-		ug/kg		91	U	ug/kg	91	-		ug/kg	
Aroclor-1248	89	U	ug/kg	89	-		ug/kg		91	U	ug/kg	91	-		ug/kg	
Aroclor-1254	180	U	ug/kg	180	-		ug/kg		180	U	ug/kg	180	-		ug/kg	
Aroclor-1260	180	U	ug/kg	180	-		ug/kg		180	U	ug/kg	180	-		ug/kg	
CLP METALS AND CYANIDE mg/kg																
Aluminum	14100		mg/kg	40	-		mg/kg		19300		mg/kg	40	-		mg/kg	
Antimony	2.7	U	mg/kg	12	-		mg/kg		2.8	U	mg/kg	12	-		mg/kg	
Arsenic	2.9		mg/kg	2	-		mg/kg		3.9		mg/kg	2	-		mg/kg	
Barium	9.5	J	mg/kg	40	-		mg/kg		7.6	J	mg/kg	40	-		mg/kg	
Beryllium	.07	J	mg/kg	1	-		mg/kg		.08	J	mg/kg	1	-		mg/kg	
Cadmium	.6	U	mg/kg	1	-		mg/kg		.61	U	mg/kg	1	-		mg/kg	
Calcium	525	J	mg/kg	1000	-		mg/kg		143	J	mg/kg	1000	-		mg/kg	
Chromium	11.6		mg/kg	2	-		mg/kg		18.6		mg/kg	2	-		mg/kg	
Cobalt	.34	UJ	mg/kg	10	-		mg/kg		.73	J	mg/kg	10	-		mg/kg	
Copper	9.2		mg/kg	5	-		mg/kg		5.9		mg/kg	5	-		mg/kg	
Iron	8150		mg/kg	20	-		mg/kg		14900		mg/kg	20	-		mg/kg	
Lead	5.8		mg/kg	1	-		mg/kg		5.8		mg/kg	1	-		mg/kg	
Magnesium	172	J	mg/kg	1000	-		mg/kg		98.9	J	mg/kg	1000	-		mg/kg	
Manganese	32.8		mg/kg	3	-		mg/kg		25.4		mg/kg	3	-		mg/kg	
Mercury	.04	J	mg/kg	.1	-		mg/kg		.05	J	mg/kg	.1	-		mg/kg	
Nickel	2.4	U	mg/kg	8	-		mg/kg		2.8	J	mg/kg	8	-		mg/kg	
Potassium	132	U	mg/kg	1000	-		mg/kg		135	U	mg/kg	1000	-		mg/kg	
Selenium	.46	U	mg/kg	1	-		mg/kg		.47	U	mg/kg	1	-		mg/kg	
Silver	.74	J	mg/kg	2	-		mg/kg		.76	J	mg/kg	2	-		mg/kg	
Sodium	181	J	mg/kg	1000	-		mg/kg		202	J	mg/kg	1000	-		mg/kg	
Thallium	.35	U	mg/kg	2	-		mg/kg		.35	U	mg/kg	2	-		mg/kg	
Vanadium	23.1		mg/kg	10	-		mg/kg		41.3		mg/kg	10	-		mg/kg	
Zinc	13.2		mg/kg	4	-		mg/kg		8.2	J	mg/kg	4	-		mg/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 13 Surface Soil Data

Lab Sample Number:	22526007				33701007				22526008				33701008			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	13-SL-01				13-SL-01				13-SL-02				13-SL-02			
Collect Date:	18-AUG-92				18-AUG-92				18-AUG-92				18-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Cyanide	.24	U	mg/kg	1	-		mg/kg		.25	U	mg/kg	1	-		mg/kg	
Total petroleum hydrocarbons	-		mg/kg		-		mg/kg		-		mg/kg		-		mg/kg	
Total organic carbon	-		mg/kg		-		mg/kg		-		mg/kg		-		mg/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 13 Surface Soil Data

Lab Sample Number:		22526009			33701009			22526010			33701010		
Site		WHITING			WHITING			WHITING			WHITING		
Locator		13-SL-03			13-SL-03			13-SL-04			13-SL-04		
Collect Date:		18-AUG-92			18-AUG-92			18-AUG-92			18-AUG-92		
		VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL
CLP VOLATILES 90-SOW	ug/kg												
Chloromethane		-	ug/kg		11 U	ug/kg	11	-	ug/kg		11 U	ug/kg	11
Bromomethane		-	ug/kg		11 U	ug/kg	11	-	ug/kg		11 U	ug/kg	11
Vinyl chloride		-	ug/kg		11 U	ug/kg	11	-	ug/kg		11 U	ug/kg	11
Chloroethane		-	ug/kg		11 U	ug/kg	11	-	ug/kg		11 U	ug/kg	11
Methylene chloride		-	ug/kg		12 UJ	ug/kg	5	-	ug/kg		13 UJ	ug/kg	6
Acetone		-	ug/kg		11 UJ	ug/kg	11	-	ug/kg		11 UJ	ug/kg	11
Carbon disulfide		-	ug/kg		5 U	ug/kg	5	-	ug/kg		6 U	ug/kg	6
1,1-Dichloroethene		-	ug/kg		5 U	ug/kg	5	-	ug/kg		6 U	ug/kg	6
1,1-Dichloroethane		-	ug/kg		5 U	ug/kg	5	-	ug/kg		6 U	ug/kg	6
1,2-Dichloroethene (total)		-	ug/kg		5 U	ug/kg	5	-	ug/kg		6 U	ug/kg	6
Chloroform		-	ug/kg		5 U	ug/kg	5	-	ug/kg		6 U	ug/kg	6
1,2-Dichloroethane		-	ug/kg		5 U	ug/kg	5	-	ug/kg		6 U	ug/kg	6
2-Butanone		-	ug/kg		11 U	ug/kg	11	-	ug/kg		11 U	ug/kg	11
1,1,1-Trichloroethane		-	ug/kg		5 U	ug/kg	5	-	ug/kg		6 U	ug/kg	6
Carbon tetrachloride		-	ug/kg		5 U	ug/kg	5	-	ug/kg		6 U	ug/kg	6
Bromodichloromethane		-	ug/kg		5 U	ug/kg	5	-	ug/kg		6 U	ug/kg	6
1,2-Dichloropropane		-	ug/kg		5 U	ug/kg	5	-	ug/kg		6 U	ug/kg	6
cis-1,3-Dichloropropene		-	ug/kg		5 U	ug/kg	5	-	ug/kg		6 U	ug/kg	6
Trichloroethene		-	ug/kg		5 U	ug/kg	5	-	ug/kg		6 U	ug/kg	6
Dibromochloromethane		-	ug/kg		5 U	ug/kg	5	-	ug/kg		6 U	ug/kg	6
1,1,2-Trichloroethane		-	ug/kg		5 U	ug/kg	5	-	ug/kg		6 U	ug/kg	6
Benzene		-	ug/kg		5 U	ug/kg	5	-	ug/kg		6 U	ug/kg	6
trans-1,3-Dichloropropene		-	ug/kg		5 U	ug/kg	5	-	ug/kg		6 U	ug/kg	6
Bromoform		-	ug/kg		11 U	ug/kg	11	-	ug/kg		11 U	ug/kg	11
4-Methyl-2-pentanone		-	ug/kg		11 U	ug/kg	11	-	ug/kg		11 U	ug/kg	11
2-Hexanone		-	ug/kg		5 U	ug/kg	5	-	ug/kg		6 U	ug/kg	6
Tetrachloroethene		-	ug/kg		5 U	ug/kg	5	-	ug/kg		6 U	ug/kg	6
Toluene		-	ug/kg		5 U	ug/kg	5	-	ug/kg		6 U	ug/kg	6
1,1,2,2-Tetrachloroethane		-	ug/kg		5 U	ug/kg	5	-	ug/kg		6 U	ug/kg	6
Chlorobenzene		-	ug/kg		5 U	ug/kg	5	-	ug/kg		6 U	ug/kg	6
Ethylbenzene		-	ug/kg		5 U	ug/kg	5	-	ug/kg		6 U	ug/kg	6
Styrene		-	ug/kg		5 U	ug/kg	5	-	ug/kg		6 U	ug/kg	6
Xylenes (total)		-	ug/kg		5 U	ug/kg	5	-	ug/kg		6 U	ug/kg	6
CLP SEMIVOLATILES 90-SOW	ug/kg												
Phenol		370 U	ug/kg	370	-	ug/kg		380 U	ug/kg	380	-	ug/kg	
bis(2-Chloroethyl) ether		370 U	ug/kg	370	-	ug/kg		380 U	ug/kg	380	-	ug/kg	
2-Chlorophenol		370 U	ug/kg	370	-	ug/kg		380 U	ug/kg	380	-	ug/kg	
1,3-Dichlorobenzene		370 U	ug/kg	370	-	ug/kg		380 U	ug/kg	380	-	ug/kg	
1,4-Dichlorobenzene		370 U	ug/kg	370	-	ug/kg		380 U	ug/kg	380	-	ug/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 13 Surface Soil Data

Lab Sample Number:	22526009				33701009				22526010				33701010			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	13-SL-03				13-SL-03				13-SL-04				13-SL-04			
Collect Date:	18-AUG-92				18-AUG-92				18-AUG-92				18-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
1,2-Dichlorobenzene	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
2-Methylphenol	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
2,2-oxybis(1-Chloropropane)	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
4-Methylphenol	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
N-Nitroso-di-n-propylamine	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
Hexachloroethane	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
Nitrobenzene	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
Isophorone	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
2-Nitrophenol	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
2,4-Dimethylphenol	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
bis(2-Chloroethoxy) methane	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
2,4-Dichlorophenol	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
1,2,4-Trichlorobenzene	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
Naphthalene	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
4-Chloroaniline	370	U	ug/kg	370	-		ug/kg		380	UJ	ug/kg	380	-		ug/kg	
Hexachlorobutadiene	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
4-Chloro-3-methylphenol	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
2-Methylnaphthalene	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
Hexachlorocyclopentadiene	370	UJ	ug/kg	370	-		ug/kg		380	UJ	ug/kg	380	-		ug/kg	
2,4,6-Trichlorophenol	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
2,4,5-Trichlorophenol	1800	U	ug/kg	1800	-		ug/kg		1800	UJ	ug/kg	1800	-		ug/kg	
2-Chloronaphthalene	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
2-Nitroaniline	1800	U	ug/kg	1800	-		ug/kg		1800	U	ug/kg	1800	-		ug/kg	
Dimethylphthalate	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
Acenaphthylene	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
2,6-Dinitrotoluene	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
3-Nitroaniline	1800	U	ug/kg	1800	-		ug/kg		1800	UJ	ug/kg	1800	-		ug/kg	
Acenaphthene	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
2,4-Dinitrophenol	1800	U	ug/kg	1800	-		ug/kg		1800	UJ	ug/kg	1800	-		ug/kg	
4-Nitrophenol	1800	U	ug/kg	1800	-		ug/kg		1800	U	ug/kg	1800	-		ug/kg	
Dibenzofuran	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
2,4-Dinitrotoluene	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
Diethylphthalate	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
4-Chlorophenyl-phenylether	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
Fluorene	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
4-Nitroaniline	1800	U	ug/kg	1800	-		ug/kg		1800	UJ	ug/kg	1800	-		ug/kg	
4,6-Dinitro-2-methylphenol	1800	U	ug/kg	1800	-		ug/kg		1800	UJ	ug/kg	1800	-		ug/kg	
N-Nitrosodiphenylamine	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
4-Bromophenyl-phenylether	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
Hexachlorobenzene	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
Pentachlorophenol	1800	U	ug/kg	1800	-		ug/kg		1800	U	ug/kg	1800	-		ug/kg	
Phenanthrene	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
Anthracene	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
Carbazole	-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Di-n-butylphthalate	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
Fluoranthene	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
Pyrene	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
Butylbenzylphthalate	370	U	ug/kg	370	-		ug/kg		380	UJ	ug/kg	380	-		ug/kg	
3,3-Dichlorobenzidine	730	U	ug/kg	730	-		ug/kg		760	U	ug/kg	760	-		ug/kg	
Benzo (a) anthracene	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
Chrysene	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
bis(2-Ethylhexyl) phthalate	370	U	ug/kg	370	-		ug/kg		450		ug/kg	380	-		ug/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 13 Surface Soil Data

Lab Sample Number:	22526009				33701009				22526010				33701010			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	13-SL-03				13-SL-03				13-SL-04				13-SL-04			
Collect Date:	18-AUG-92				18-AUG-92				18-AUG-92				18-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Di-n-octylphthalate	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
Benzo (b) fluoranthene	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
Benzo (k) fluoranthene	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
Benzo (a) pyrene	370	U	ug/kg	370	-		ug/kg		380	U	ug/kg	380	-		ug/kg	
Indeno (1,2,3-cd) pyrene	370	U	ug/kg	370	-		ug/kg		380	UJ	ug/kg	380	-		ug/kg	
Dibenzo (a,h) anthracene	370	U	ug/kg	370	-		ug/kg		380	UJ	ug/kg	380	-		ug/kg	
Benzo (g,h,i) perylene	370	U	ug/kg	370	-		ug/kg		380	UJ	ug/kg	380	-		ug/kg	
CLP PESTICIDES/PCBS 90-SOW ug/kg																
alpha-BHC	8.9	U	ug/kg	8.9	-		ug/kg		9.2	U	ug/kg	9.2	-		ug/kg	
beta-BHC	8.9	U	ug/kg	8.9	-		ug/kg		9.2	U	ug/kg	9.2	-		ug/kg	
delta-BHC	8.9	U	ug/kg	8.9	-		ug/kg		9.2	U	ug/kg	9.2	-		ug/kg	
gamma-BHC (Lindane)	8.9	U	ug/kg	8.9	-		ug/kg		9.2	U	ug/kg	9.2	-		ug/kg	
Heptachlor	8.9	U	ug/kg	8.9	-		ug/kg		9.2	U	ug/kg	9.2	-		ug/kg	
Aldrin	8.9	U	ug/kg	8.9	-		ug/kg		9.2	U	ug/kg	9.2	-		ug/kg	
Heptachlor epoxide	8.9	U	ug/kg	8.9	-		ug/kg		9.2	U	ug/kg	9.2	-		ug/kg	
Endosulfan I	8.9	U	ug/kg	8.9	-		ug/kg		9.2	U	ug/kg	9.2	-		ug/kg	
Dieldrin	18	U	ug/kg	18	-		ug/kg		18	U	ug/kg	18	-		ug/kg	
4,4-DDE	18	U	ug/kg	18	-		ug/kg		18	U	ug/kg	18	-		ug/kg	
Endrin	18	U	ug/kg	18	-		ug/kg		18	U	ug/kg	18	-		ug/kg	
Endosulfan II	18	U	ug/kg	18	-		ug/kg		18	U	ug/kg	18	-		ug/kg	
4,4-DDD	18	U	ug/kg	18	-		ug/kg		18	U	ug/kg	18	-		ug/kg	
Endosulfan sulfate	18	U	ug/kg	18	-		ug/kg		18	U	ug/kg	18	-		ug/kg	
4,4-DDT	18	U	ug/kg	18	-		ug/kg		18	U	ug/kg	18	-		ug/kg	
Methoxychlor	89	U	ug/kg	89	-		ug/kg		92	U	ug/kg	92	-		ug/kg	
Endrin ketone	18	U	ug/kg	18	-		ug/kg		18	U	ug/kg	18	-		ug/kg	
Endrin aldehyde	-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
alpha-Chlordane	89	U	ug/kg	89	-		ug/kg		92	U	ug/kg	92	-		ug/kg	
gamma-Chlordane	89	U	ug/kg	89	-		ug/kg		92	U	ug/kg	92	-		ug/kg	
Toxaphene	180	U	ug/kg	180	-		ug/kg		180	U	ug/kg	180	-		ug/kg	
Aroclor-1016	89	U	ug/kg	89	-		ug/kg		92	U	ug/kg	92	-		ug/kg	
Aroclor-1221	89	U	ug/kg	89	-		ug/kg		92	U	ug/kg	92	-		ug/kg	
Aroclor-1232	89	U	ug/kg	89	-		ug/kg		92	U	ug/kg	92	-		ug/kg	
Aroclor-1242	89	U	ug/kg	89	-		ug/kg		92	U	ug/kg	92	-		ug/kg	
Aroclor-1248	89	U	ug/kg	89	-		ug/kg		92	U	ug/kg	92	-		ug/kg	
Aroclor-1254	180	U	ug/kg	180	-		ug/kg		180	U	ug/kg	180	-		ug/kg	
Aroclor-1260	180	U	ug/kg	180	-		ug/kg		180	U	ug/kg	180	-		ug/kg	
CLP METALS AND CYANIDE mg/kg																
Aluminum	10900		mg/kg	40	-		mg/kg		20900		mg/kg	40	-		mg/kg	
Antimony	2.7	U	mg/kg	12	-		mg/kg		2.9	U	mg/kg	12	-		mg/kg	
Arsenic	3.4		mg/kg	2	-		mg/kg		6.9		mg/kg	2	-		mg/kg	
Barium	5.9	J	mg/kg	40	-		mg/kg		9.1	J	mg/kg	40	-		mg/kg	
Beryllium	.06	J	mg/kg	1	-		mg/kg		.16	J	mg/kg	1	-		mg/kg	
Cadmium	.61	U	mg/kg	1	-		mg/kg		.64	U	mg/kg	1	-		mg/kg	
Calcium	350	J	mg/kg	1000	-		mg/kg		355	J	mg/kg	1000	-		mg/kg	
Chromium	11		mg/kg	2	-		mg/kg		17.7		mg/kg	2	-		mg/kg	
Cobalt	.51	J	mg/kg	10	-		mg/kg		1.3	J	mg/kg	10	-		mg/kg	
Copper	7.6		mg/kg	5	-		mg/kg		5.2	J	mg/kg	5	-		mg/kg	
Iron	8990		mg/kg	20	-		mg/kg		15500		mg/kg	20	-		mg/kg	
Lead	4.6		mg/kg	1	-		mg/kg		10.5		mg/kg	1	-		mg/kg	
Magnesium	107	J	mg/kg	1000	-		mg/kg		87.5	J	mg/kg	1000	-		mg/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 13 Surface Soil Data

Lab Sample Number:	22526009				33701009				22526010				33701010			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	13-SL-03				13-SL-03				13-SL-04				13-SL-04			
Collect Date:	18-AUG-92				18-AUG-92				18-AUG-92				18-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Manganese	18.7		mg/kg	3	-		mg/kg		62.1		mg/kg	3	-		mg/kg	
Mercury	.04	J	mg/kg	.1	-		mg/kg		.04	J	mg/kg	.1	-		mg/kg	
Nickel	2.4	U	mg/kg	8	-		mg/kg		2.5	U	mg/kg	8	-		mg/kg	
Potassium	133	U	mg/kg	1000	-		mg/kg		140	U	mg/kg	1000	-		mg/kg	
Selenium	.46	U	mg/kg	1	-		mg/kg		.48	U	mg/kg	1	-		mg/kg	
Silver	.39	J	mg/kg	2	-		mg/kg		1.2	J	mg/kg	2	-		mg/kg	
Sodium	173	J	mg/kg	1000	-		mg/kg		193	J	mg/kg	1000	-		mg/kg	
Thallium	.35	U	mg/kg	2	-		mg/kg		.37	U	mg/kg	2	-		mg/kg	
Vanadium	26.5		mg/kg	10	-		mg/kg		42		mg/kg	10	-		mg/kg	
Zinc	7.8	J	mg/kg	4	-		mg/kg		10.8	J	mg/kg	4	-		mg/kg	
Cyanide	.24	U	mg/kg	1	-		mg/kg		.25	U	mg/kg	1	-		mg/kg	
Total petroleum hydrocarbons	-		mg/kg		-		mg/kg		-		mg/kg		-		mg/kg	
Total organic carbon	-		mg/kg		-		mg/kg		-		mg/kg		-		mg/kg	

Naval Air Station Whiting [illegible]d, Milton, Florida
Site 13 Surface [illegible]l Data

Lab Sample Number:		22526011			33701011			22526012			33701012		
Site		WHITING			WHITING			WHITING			WHITING		
Locator		13-SL-05			13-SL-05			13-SL-05A			13-SL-05A		
Collect Date:		18-AUG-92			18-AUG-92			18-AUG-92			18-AUG-92		
		VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL
CLP VOLATILES 90-SOW	ug/kg												
Chloromethane		-	ug/kg		12 U	ug/kg	12	-	ug/kg		12 U	ug/kg	12
Bromomethane		-	ug/kg		12 U	ug/kg	12	-	ug/kg		12 U	ug/kg	12
Vinyl chloride		-	ug/kg		12 U	ug/kg	12	-	ug/kg		12 U	ug/kg	12
Chloroethane		-	ug/kg		12 U	ug/kg	12	-	ug/kg		12 U	ug/kg	12
Methylene chloride		-	ug/kg		17 UJ	ug/kg	6	-	ug/kg		13 UJ	ug/kg	6
Acetone		-	ug/kg		12 UJ	ug/kg	12	-	ug/kg		12 UJ	ug/kg	12
Carbon disulfide		-	ug/kg		6 U	ug/kg	6	-	ug/kg		6 U	ug/kg	6
1,1-Dichloroethene		-	ug/kg		6 U	ug/kg	6	-	ug/kg		6 U	ug/kg	6
1,1-Dichloroethane		-	ug/kg		6 U	ug/kg	6	-	ug/kg		6 U	ug/kg	6
1,2-Dichloroethene (total)		-	ug/kg		6 U	ug/kg	6	-	ug/kg		6 U	ug/kg	6
Chloroform		-	ug/kg		6 U	ug/kg	6	-	ug/kg		6 U	ug/kg	6
1,2-Dichloroethane		-	ug/kg		6 U	ug/kg	6	-	ug/kg		6 U	ug/kg	6
2-Butanone		-	ug/kg		12 U	ug/kg	12	-	ug/kg		12 U	ug/kg	12
1,1,1-Trichloroethane		-	ug/kg		6 U	ug/kg	6	-	ug/kg		6 U	ug/kg	6
Carbon tetrachloride		-	ug/kg		6 U	ug/kg	6	-	ug/kg		6 U	ug/kg	6
Bromodichloromethane		-	ug/kg		6 U	ug/kg	6	-	ug/kg		6 U	ug/kg	6
1,2-Dichloropropane		-	ug/kg		6 U	ug/kg	6	-	ug/kg		6 U	ug/kg	6
cis-1,3-Dichloropropene		-	ug/kg		6 U	ug/kg	6	-	ug/kg		6 U	ug/kg	6
Trichloroethene		-	ug/kg		6 U	ug/kg	6	-	ug/kg		6 U	ug/kg	6
Dibromochloromethane		-	ug/kg		6 U	ug/kg	6	-	ug/kg		6 U	ug/kg	6
1,1,2-Trichloroethane		-	ug/kg		6 U	ug/kg	6	-	ug/kg		6 U	ug/kg	6
Benzene		-	ug/kg		6 U	ug/kg	6	-	ug/kg		6 U	ug/kg	6
trans-1,3-Dichloropropene		-	ug/kg		6 U	ug/kg	6	-	ug/kg		6 U	ug/kg	6
Bromoform		-	ug/kg		6 U	ug/kg	6	-	ug/kg		6 U	ug/kg	6
4-Methyl-2-pentanone		-	ug/kg		12 U	ug/kg	12	-	ug/kg		12 U	ug/kg	12
2-Hexanone		-	ug/kg		12 U	ug/kg	12	-	ug/kg		12 U	ug/kg	12
Tetrachloroethene		-	ug/kg		6 U	ug/kg	6	-	ug/kg		6 U	ug/kg	6
Toluene		-	ug/kg		6 U	ug/kg	6	-	ug/kg		6 U	ug/kg	6
1,1,2,2-Tetrachloroethane		-	ug/kg		6 U	ug/kg	6	-	ug/kg		6 U	ug/kg	6
Chlorobenzene		-	ug/kg		6 U	ug/kg	6	-	ug/kg		6 U	ug/kg	6
Ethylbenzene		-	ug/kg		6 U	ug/kg	6	-	ug/kg		6 U	ug/kg	6
Styrene		-	ug/kg		6 U	ug/kg	6	-	ug/kg		6 U	ug/kg	6
Xylenes (total)		-	ug/kg		6 U	ug/kg	6	-	ug/kg		6 U	ug/kg	6
CLP SEMIVOLATILES 90-SOW	ug/kg												
Phenol		390 U	ug/kg	390	-	ug/kg		400 U	ug/kg	400	-	ug/kg	
bis(2-Chloroethyl) ether		390 U	ug/kg	390	-	ug/kg		400 U	ug/kg	400	-	ug/kg	
2-Chlorophenol		390 U	ug/kg	390	-	ug/kg		400 U	ug/kg	400	-	ug/kg	
1,3-Dichlorobenzene		390 U	ug/kg	390	-	ug/kg		400 U	ug/kg	400	-	ug/kg	
1,4-Dichlorobenzene		390 U	ug/kg	390	-	ug/kg		400 U	ug/kg	400	-	ug/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 13 Surface Soil Data

Lab Sample Number:	22526011				33701011				22526012				33701012			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	13-SL-05				13-SL-05				13-SL-05A				13-SL-05A			
Collect Date:	18-AUG-92				18-AUG-92				18-AUG-92				18-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
1,2-Dichlorobenzene	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
2-Methylphenol	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
2,2-oxybis(1-Chloropropane)	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
4-Methylphenol	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
N-Nitroso-di-n-propylamine	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
Hexachloroethane	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
Nitrobenzene	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
Isophorone	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
2-Nitrophenol	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
2,4-Dimethylphenol	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
bis(2-Chloroethoxy) methane	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
2,4-Dichlorophenol	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
1,2,4-Trichlorobenzene	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
Naphthalene	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
4-Chloroaniline	390	UJ	ug/kg	390	-		ug/kg		400	UJ	ug/kg	400	-		ug/kg	
Hexachlorobutadiene	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
4-Chloro-3-methylphenol	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
2-Methylnaphthalene	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
Hexachlorocyclopentadiene	390	UJ	ug/kg	390	-		ug/kg		400	UJ	ug/kg	400	-		ug/kg	
2,4,6-Trichlorophenol	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
2,4,5-Trichlorophenol	1900	UJ	ug/kg	1900	-		ug/kg		1900	UJ	ug/kg	1900	-		ug/kg	
2-Chloronaphthalene	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
2-Nitroaniline	1900	U	ug/kg	1900	-		ug/kg		1900	U	ug/kg	1900	-		ug/kg	
Dimethylphthalate	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
Acenaphthylene	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
2,6-Dinitrotoluene	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
3-Nitroaniline	1900	UJ	ug/kg	1900	-		ug/kg		1900	UJ	ug/kg	1900	-		ug/kg	
Acenaphthene	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
2,4-Dinitrophenol	1900	UJ	ug/kg	1900	-		ug/kg		1900	UJ	ug/kg	1900	-		ug/kg	
4-Nitrophenol	1900	U	ug/kg	1900	-		ug/kg		1900	U	ug/kg	1900	-		ug/kg	
Dibenzofuran	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
2,4-Dinitrotoluene	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
Diethylphthalate	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
4-Chlorophenyl-phenylether	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
Fluorene	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
4-Nitroaniline	1900	UJ	ug/kg	1900	-		ug/kg		1900	UJ	ug/kg	1900	-		ug/kg	
4,6-Dinitro-2-methylphenol	1900	UJ	ug/kg	1900	-		ug/kg		1900	UJ	ug/kg	1900	-		ug/kg	
N-Nitrosodiphenylamine	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
4-Bromophenyl-phenylether	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
Hexachlorobenzene	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
Pentachlorophenol	1900	U	ug/kg	1900	-		ug/kg		1900	U	ug/kg	1900	-		ug/kg	
Phenanthrene	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
Anthracene	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
Carbazole	-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Di-n-butylphthalate	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
Fluoranthene	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
Pyrene	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
Butylbenzylphthalate	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
3,3-Dichlorobenzidine	790	UJ	ug/kg	790	-		ug/kg		800	UJ	ug/kg	800	-		ug/kg	
Benzo (a) anthracene	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
Chrysene	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
bis(2-Ethylhexyl) phthalate	390	U	ug/kg	390	-		ug/kg		64	J	ug/kg	400	-		ug/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 13 Surface Soil Data

Lab Sample Number:	22526011				33701011				22526012				33701012			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	13-SL-05				13-SL-05				13-SL-05A				13-SL-05A			
Collect Date:	18-AUG-92				18-AUG-92				18-AUG-92				18-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Di-n-octylphthalate	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
Benzo (b) fluoranthene	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
Benzo (k) fluoranthene	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
Benzo (a) pyrene	390	U	ug/kg	390	-		ug/kg		400	U	ug/kg	400	-		ug/kg	
Indeno (1,2,3-cd) pyrene	390	UJ	ug/kg	390	-		ug/kg		400	UJ	ug/kg	400	-		ug/kg	
Dibenzo (a,h) anthracene	390	UJ	ug/kg	390	-		ug/kg		400	UJ	ug/kg	400	-		ug/kg	
Benzo (g,h,i) perylene	390	UJ	ug/kg	390	-		ug/kg		400	UJ	ug/kg	400	-		ug/kg	
CLP PESTICIDES/PCBS 90-SOW ug/kg																
alpha-BHC	9.5	U	ug/kg	9.5	-		ug/kg		9.6	U	ug/kg	9.6	-		ug/kg	
beta-BHC	9.5	U	ug/kg	9.5	-		ug/kg		9.6	U	ug/kg	9.6	-		ug/kg	
delta-BHC	9.5	U	ug/kg	9.5	-		ug/kg		9.6	U	ug/kg	9.6	-		ug/kg	
gamma-BHC (Lindane)	9.5	U	ug/kg	9.5	-		ug/kg		9.6	U	ug/kg	9.6	-		ug/kg	
Heptachlor	9.5	U	ug/kg	9.5	-		ug/kg		9.6	U	ug/kg	9.6	-		ug/kg	
Aldrin	9.5	U	ug/kg	9.5	-		ug/kg		9.6	U	ug/kg	9.6	-		ug/kg	
Heptachlor epoxide	9.5	U	ug/kg	9.5	-		ug/kg		9.6	U	ug/kg	9.6	-		ug/kg	
Endosulfan I	9.5	U	ug/kg	9.5	-		ug/kg		9.6	U	ug/kg	9.6	-		ug/kg	
Dieldrin	19	U	ug/kg	19	-		ug/kg		19	U	ug/kg	19	-		ug/kg	
4,4-DDE	19	U	ug/kg	19	-		ug/kg		19	U	ug/kg	19	-		ug/kg	
Endrin	19	U	ug/kg	19	-		ug/kg		19	U	ug/kg	19	-		ug/kg	
Endosulfan II	19	U	ug/kg	19	-		ug/kg		19	U	ug/kg	19	-		ug/kg	
4,4-DDD	19	U	ug/kg	19	-		ug/kg		19	U	ug/kg	19	-		ug/kg	
Endosulfan sulfate	19	U	ug/kg	19	-		ug/kg		19	U	ug/kg	19	-		ug/kg	
4,4-DDT	19	U	ug/kg	19	-		ug/kg		19	U	ug/kg	19	-		ug/kg	
Methoxychlor	95	U	ug/kg	95	-		ug/kg		96	U	ug/kg	96	-		ug/kg	
Endrin ketone	19	U	ug/kg	19	-		ug/kg		19	U	ug/kg	19	-		ug/kg	
Endrin aldehyde	-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
alpha-Chlordane	95	U	ug/kg	95	-		ug/kg		96	U	ug/kg	96	-		ug/kg	
gamma-Chlordane	95	U	ug/kg	95	-		ug/kg		96	U	ug/kg	96	-		ug/kg	
Toxaphene	190	U	ug/kg	190	-		ug/kg		190	U	ug/kg	190	-		ug/kg	
Aroclor-1016	95	U	ug/kg	95	-		ug/kg		96	U	ug/kg	96	-		ug/kg	
Aroclor-1221	95	U	ug/kg	95	-		ug/kg		96	U	ug/kg	96	-		ug/kg	
Aroclor-1232	95	U	ug/kg	95	-		ug/kg		96	U	ug/kg	96	-		ug/kg	
Aroclor-1242	95	U	ug/kg	95	-		ug/kg		96	U	ug/kg	96	-		ug/kg	
Aroclor-1248	95	U	ug/kg	95	-		ug/kg		96	U	ug/kg	96	-		ug/kg	
Aroclor-1254	190	U	ug/kg	190	-		ug/kg		190	U	ug/kg	190	-		ug/kg	
Aroclor-1260	190	U	ug/kg	190	-		ug/kg		190	U	ug/kg	190	-		ug/kg	
CLP METALS AND CYANIDE mg/kg																
Aluminum	10500		mg/kg	40	-		mg/kg		8070		mg/kg	40	-		mg/kg	
Antimony	2.9	U	mg/kg	12	-		mg/kg		2.9	U	mg/kg	12	-		mg/kg	
Arsenic	2.4		mg/kg	2	-		mg/kg		2	J	mg/kg	2	-		mg/kg	
Barium	7.9	J	mg/kg	40	-		mg/kg		6.6	J	mg/kg	40	-		mg/kg	
Beryllium	.06	UJ	mg/kg	1	-		mg/kg		.06	UJ	mg/kg	1	-		mg/kg	
Cadmium	.65	U	mg/kg	1	-		mg/kg		.64	U	mg/kg	1	-		mg/kg	
Calcium	78.4	J	mg/kg	1000	-		mg/kg		92.4	J	mg/kg	1000	-		mg/kg	
Chromium	8.2		mg/kg	2	-		mg/kg		7.4		mg/kg	2	-		mg/kg	
Cobalt	.74	J	mg/kg	10	-		mg/kg		1	J	mg/kg	10	-		mg/kg	
Copper	4		mg/kg	5	-		mg/kg		4.2	J	mg/kg	5	-		mg/kg	
Iron	6680		mg/kg	20	-		mg/kg		4960		mg/kg	20	-		mg/kg	
Lead	3.2		mg/kg	1	-		mg/kg		4		mg/kg	1	-		mg/kg	
Magnesium	57.5	J	mg/kg	1000	-		mg/kg		50.6	J	mg/kg	1000	-		mg/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 13 Surface Soil Data

Lab Sample Number:	22526011				33701011				22526012				33701012			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	13-SL-05				13-SL-05				13-SL-05A				13-SL-05A			
Collect Date:	18-AUG-92				18-AUG-92				18-AUG-92				18-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Manganese	79.1		mg/kg	3	-		mg/kg		77		mg/kg	3	-		mg/kg	
Mercury	.05	J	mg/kg	.1	-		mg/kg		.05	J	mg/kg	.1	-		mg/kg	
Nickel	2.5	U	mg/kg	8	-		mg/kg		2.9	J	mg/kg	8	-		mg/kg	
Potassium	143	U	mg/kg	1000	-		mg/kg		141	U	mg/kg	1000	-		mg/kg	
Selenium	.5	U	mg/kg	1	-		mg/kg		.49	U	mg/kg	1	-		mg/kg	
Silver	.48	J	mg/kg	2	-		mg/kg		.36	J	mg/kg	2	-		mg/kg	
Sodium	176	J	mg/kg	1000	-		mg/kg		262	J	mg/kg	1000	-		mg/kg	
Thallium	.38	U	mg/kg	2	-		mg/kg		.37	U	mg/kg	2	-		mg/kg	
Vanadium	17.5		mg/kg	10	-		mg/kg		13.1		mg/kg	10	-		mg/kg	
Zinc	17.5		mg/kg	4	-		mg/kg		16.1		mg/kg	4	-		mg/kg	
Cyanide	.26	U	mg/kg	1	-		mg/kg		.26	U	mg/kg	1	-		mg/kg	
Total petroleum hydrocarbons	-		mg/kg		-		mg/kg		-		mg/kg		-		mg/kg	
Total organic carbon	-		mg/kg		-		mg/kg		-		mg/kg		-		mg/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 13 Surface Soil Data

Lab Sample Number:		G8895002			G8895003			G8895004			G8895005		
Site		WHITING			WHITING			WHITING			WHITING		
Locator		13S00101			13S00201			13S00301			13S00401		
Collect Date:		08-DEC-95			08-DEC-95			08-DEC-95			08-DEC-95		
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	
CLP VOLATILES 90-SOW	ug/kg												
Chloromethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
Bromomethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
Vinyl chloride	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
Chloroethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
Methylene chloride	11	U	ug/kg	11	4	J	ug/kg	11	4	J	ug/kg	11	4 J ug/kg 12
Acetone	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	19 U ug/kg 19
Carbon disulfide	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
1,1-Dichloroethene	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
1,1-Dichloroethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
1,2-Dichloroethene (total)	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
Chloroform	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
1,2-Dichloroethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
2-Butanone	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
1,1,1-Trichloroethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
Carbon tetrachloride	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
Bromodichloromethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
1,2-Dichloropropane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
cis-1,3-Dichloropropene	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
Trichloroethene	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
Dibromochloromethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
1,1,2-Trichloroethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
Benzene	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
trans-1,3-Dichloropropene	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
Bromoform	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
4-Methyl-2-pentanone	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
2-Hexanone	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
Tetrachloroethene	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
Toluene	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
1,1,2,2-Tetrachloroethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
Chlorobenzene	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
Ethylbenzene	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
Styrene	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
Xylenes (total)	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12 U ug/kg 12
CLP SEMIVOLATILES 90-SOW	ug/kg												
Phenol	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380 U ug/kg 380
bis(2-Chloroethyl) ether	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380 U ug/kg 380
2-Chlorophenol	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380 U ug/kg 380
1,3-Dichlorobenzene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380 U ug/kg 380
1,4-Dichlorobenzene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380 U ug/kg 380

Naval Air Station Whiting Field, Milton, Florida
Site 13 Surface Soil Data

Lab Sample Number:	G8895002				G8895003				G8895004				G8895005			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	13S00101				13S00201				13S00301				13S00401			
Collect Date:	08-DEC-95				08-DEC-95				08-DEC-95				08-DEC-95			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
1,2-Dichlorobenzene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
2-Methylphenol	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
2,2-oxybis(1-Chloropropane)	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
4-Methylphenol	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
N-Nitroso-di-n-propylamine	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
Hexachloroethane	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
Nitrobenzene	370	UJ	ug/kg	370	370	U	ug/kg	370	370	UJ	ug/kg	370	380	UJ	ug/kg	380
Isophorone	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
2-Nitrophenol	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
2,4-Dimethylphenol	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
bis(2-Chloroethoxy) methane	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
2,4-Dichlorophenol	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
1,2,4-Trichlorobenzene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
Naphthalene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
4-Chloroaniline	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
Hexachlorobutadiene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
4-Chloro-3-methylphenol	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
2-Methylnaphthalene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
Hexachlorocyclopentadiene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
2,4,6-Trichlorophenol	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
2,4,5-Trichlorophenol	920	U	ug/kg	920	920	U	ug/kg	920	940	U	ug/kg	940	960	U	ug/kg	960
2-Chloronaphthalene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
2-Nitroaniline	920	U	ug/kg	920	920	U	ug/kg	920	940	U	ug/kg	940	960	U	ug/kg	960
Dimethylphthalate	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
Acenaphthylene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
2,6-Dinitrotoluene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
3-Nitroaniline	920	U	ug/kg	920	920	U	ug/kg	920	940	U	ug/kg	940	960	U	ug/kg	960
Acenaphthene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
2,4-Dinitrophenol	920	UJ	ug/kg	920	920	U	ug/kg	920	940	UJ	ug/kg	940	960	UJ	ug/kg	960
4-Nitrophenol	920	U	ug/kg	920	920	U	ug/kg	920	940	U	ug/kg	940	960	U	ug/kg	960
Dibenzofuran	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
2,4-Dinitrotoluene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
Diethylphthalate	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
4-Chlorophenyl-phenylether	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
Fluorene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
4-Nitroaniline	920	U	ug/kg	920	920	U	ug/kg	920	940	U	ug/kg	940	960	U	ug/kg	960
4,6-Dinitro-2-methylphenol	920	UJ	ug/kg	920	920	U	ug/kg	920	940	UJ	ug/kg	940	960	UJ	ug/kg	960
N-Nitrosodiphenylamine	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
4-Bromophenyl-phenylether	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
Hexachlorobenzene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
Pentachlorophenol	920	UJ	ug/kg	920	920	U	ug/kg	920	940	UJ	ug/kg	940	960	UJ	ug/kg	960
Phenanthrene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
Anthracene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
Carbazole	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
Di-n-butylphthalate	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
Fluoranthene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
Pyrene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
Butylbenzylphthalate	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
3,3-Dichlorobenzidine	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
Benzo (a) anthracene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
Chrysene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
bis(2-Ethylhexyl) phthalate	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380

Naval Air Station Whiting Field, Milton, Florida
Site 13 Surface Soil Data

Lab Sample Number:	G8895002				G8895003				G8895004				G8895005			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	13S00101				13S00201				13S00301				13S00401			
Collect Date:	08-DEC-95				08-DEC-95				08-DEC-95				08-DEC-95			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Di-n-octylphthalate	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
Benzo (b) fluoranthene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
Benzo (k) fluoranthene	370	UJ	ug/kg	370	370	U	ug/kg	370	370	UJ	ug/kg	370	380	UJ	ug/kg	380
Benzo (a) pyrene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
Indeno (1,2,3-cd) pyrene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
Dibenzo (a,h) anthracene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
Benzo (g,h,i) perylene	370	U	ug/kg	370	370	U	ug/kg	370	370	U	ug/kg	370	380	U	ug/kg	380
CLP PESTICIDES/PCBS 90-SOW ug/kg																
alpha-BHC	1.9	U	ug/kg	1.9	1.9	U	ug/kg	1.9	1.9	U	ug/kg	1.9	2	U	ug/kg	2
beta-BHC	1.9	U	ug/kg	1.9	1.9	U	ug/kg	1.9	1.9	U	ug/kg	1.9	2	U	ug/kg	2
delta-BHC	1.9	U	ug/kg	1.9	1.9	U	ug/kg	1.9	1.9	U	ug/kg	1.9	2	U	ug/kg	2
gamma-BHC (Lindane)	1.9	U	ug/kg	1.9	1.9	U	ug/kg	1.9	1.9	U	ug/kg	1.9	2	U	ug/kg	2
Heptachlor	1.9	U	ug/kg	1.9	1.9	U	ug/kg	1.9	1.9	U	ug/kg	1.9	2	U	ug/kg	2
Aldrin	1.9	U	ug/kg	1.9	1.9	U	ug/kg	1.9	1.9	U	ug/kg	1.9	2	U	ug/kg	2
Heptachlor epoxide	1.9	U	ug/kg	1.9	1.9	U	ug/kg	1.9	1.9	U	ug/kg	1.9	2	U	ug/kg	2
Endosulfan I	1.9	U	ug/kg	1.9	1.9	U	ug/kg	1.9	1.9	U	ug/kg	1.9	2	U	ug/kg	2
Dieldrin	3.7	U	ug/kg	3.7	3.6	U	ug/kg	3.6	3.7	U	ug/kg	3.7	3.8	U	ug/kg	3.8
4,4-DDE	3.7	U	ug/kg	3.7	3.6	U	ug/kg	3.6	3.7	U	ug/kg	3.7	3.8	U	ug/kg	3.8
Endrin	3.7	U	ug/kg	3.7	3.6	U	ug/kg	3.6	3.7	U	ug/kg	3.7	3.8	U	ug/kg	3.8
Endosulfan II	3.7	U	ug/kg	3.7	3.6	U	ug/kg	3.6	3.7	U	ug/kg	3.7	3.8	U	ug/kg	3.8
4,4-DDD	3.7	U	ug/kg	3.7	3.6	U	ug/kg	3.6	3.7	U	ug/kg	3.7	3.8	U	ug/kg	3.8
Endosulfan sulfate	3.7	U	ug/kg	3.7	3.6	U	ug/kg	3.6	3.7	U	ug/kg	3.7	3.8	U	ug/kg	3.8
4,4-DDT	3.7	U	ug/kg	3.7	3.6	U	ug/kg	3.6	3.7	U	ug/kg	3.7	3.8	U	ug/kg	3.8
Methoxychlor	19	U	ug/kg	19	19	U	ug/kg	19	19	U	ug/kg	19	20	U	ug/kg	20
Endrin ketone	3.7	U	ug/kg	3.7	3.6	U	ug/kg	3.6	3.7	U	ug/kg	3.7	3.8	U	ug/kg	3.8
Endrin aldehyde	3.7	U	ug/kg	3.7	3.6	U	ug/kg	3.6	3.7	U	ug/kg	3.7	3.8	U	ug/kg	3.8
alpha-Chlordane	1.9	U	ug/kg	1.9	1.9	U	ug/kg	1.9	1.9	U	ug/kg	1.9	2	U	ug/kg	2
gamma-Chlordane	1.9	U	ug/kg	1.9	1.9	U	ug/kg	1.9	1.9	U	ug/kg	1.9	2	U	ug/kg	2
Toxaphene	190	U	ug/kg	190	190	U	ug/kg	190	190	U	ug/kg	190	200	U	ug/kg	200
Aroclor-1016	37	U	ug/kg	37	36	U	ug/kg	36	37	U	ug/kg	37	38	U	ug/kg	38
Aroclor-1221	74	U	ug/kg	74	74	U	ug/kg	74	75	U	ug/kg	75	77	U	ug/kg	77
Aroclor-1232	37	U	ug/kg	37	36	U	ug/kg	36	37	U	ug/kg	37	38	U	ug/kg	38
Aroclor-1242	37	U	ug/kg	37	36	U	ug/kg	36	37	U	ug/kg	37	38	U	ug/kg	38
Aroclor-1248	37	U	ug/kg	37	36	U	ug/kg	36	37	U	ug/kg	37	38	U	ug/kg	38
Aroclor-1254	37	U	ug/kg	37	36	U	ug/kg	36	37	U	ug/kg	37	38	U	ug/kg	38
Aroclor-1260	37	U	ug/kg	37	36	U	ug/kg	36	37	U	ug/kg	37	38	U	ug/kg	38
CLP METALS AND CYANIDE mg/kg																
Aluminum	13200		mg/kg	40	14800		mg/kg	40	38300		mg/kg	40	10200		mg/kg	40
Antimony	12	UJ	mg/kg	12	12	UJ	mg/kg	12	12	UJ	mg/kg	12	12	UJ	mg/kg	12
Arsenic	2.6		mg/kg	2	4		mg/kg	2	6.4		mg/kg	2	3.6		mg/kg	2
Barium	26.6	J	mg/kg	40	7.5	J	mg/kg	40	14.6	J	mg/kg	40	9.7	J	mg/kg	40
Beryllium	1	UJ	mg/kg	1	1	UJ	mg/kg	1	1	UJ	mg/kg	1	1	UJ	mg/kg	1
Cadmium	1	U	mg/kg	1	1	U	mg/kg	1	1	U	mg/kg	1	1	U	mg/kg	1
Calcium	47.5	J	mg/kg	1000	34.2	J	mg/kg	1000	127	J	mg/kg	1000	121	J	mg/kg	1000
Chromium	8.8		mg/kg	2	14.4		mg/kg	2	27.9		mg/kg	2	14.3		mg/kg	2
Cobalt	1.9	J	mg/kg	10	.51	J	mg/kg	10	1.1	J	mg/kg	10	.48	J	mg/kg	10
Copper	5	UJ	mg/kg	5	5	UJ	mg/kg	5	8		mg/kg	5	5	UJ	mg/kg	5
Iron	8090		mg/kg	20	11800		mg/kg	20	23500		mg/kg	20	11900		mg/kg	20
Lead	7	J	mg/kg	.6	5.1	J	mg/kg	.6	8.3	J	mg/kg	.6	6.6	J	mg/kg	.6
Magnesium	144	J	mg/kg	1000	88.9	J	mg/kg	1000	203	J	mg/kg	1000	92	J	mg/kg	1000

Naval Air Station Whiting Field, Milton, Florida
Site 13 Surface Soil Data

Lab Sample Number:	G8895002				G8895003				G8895004				G8895005			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	13S00101				13S00201				13S00301				13S00401			
Collect Date:	08-DEC-95				08-DEC-95				08-DEC-95				08-DEC-95			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Manganese	407	J	mg/kg	3	45.1	J	mg/kg	3	69	J	mg/kg	3	57.3	J	mg/kg	3
Mercury	.03	J	mg/kg	.1	.01	J	mg/kg	.1	.02	J	mg/kg	.1	.02	J	mg/kg	.1
Nickel	4.3	J	mg/kg	8	3.9	J	mg/kg	8	6.7	J	mg/kg	8	2.9	J	mg/kg	8
Potassium	1000	U	mg/kg	1000	1000	U	mg/kg	1000	150	J	mg/kg	1000	1000	U	mg/kg	1000
Selenium	1	UJ	mg/kg	1	1	UJ	mg/kg	1	.27	J	mg/kg	1	1	UJ	mg/kg	1
Silver	2	U	mg/kg	2	2	U	mg/kg	2	2	U	mg/kg	2	2	U	mg/kg	2
Sodium	1000	UJ	mg/kg	1000	1000	UJ	mg/kg	1000	1000	UJ	mg/kg	1000	1000	UJ	mg/kg	1000
Thallium	2	U	mg/kg	2	2	U	mg/kg	2	2	U	mg/kg	2	2	UJ	mg/kg	2
Vanadium	19.8		mg/kg	10	32.4		mg/kg	10	62.4		mg/kg	10	31.8		mg/kg	10
Zinc	4	U	mg/kg	4	4	UJ	mg/kg	4	4	U	mg/kg	4	4	U	mg/kg	4
Cyanide	.5	U	mg/kg	.5	.5	U	mg/kg	.5	.5	U	mg/kg	.5	.5	U	mg/kg	.5
Total petroleum hydrocarbons	-		mg/kg		-		mg/kg		-		mg/kg		-		mg/kg	
Total organic carbon	-		mg/kg		-		mg/kg		-		mg/kg		-		mg/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 13 Surface Soil Data

Lab Sample Number:		G8895006		
Site		WHITING		
Locator		13S00501		
Collect Date:		08-DEC-95		
	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW	ug/kg			
Chloromethane	11	U	ug/kg	11
Bromomethane	11	U	ug/kg	11
Vinyl chloride	11	U	ug/kg	11
Chloroethane	11	U	ug/kg	11
Methylene chloride	8	J	ug/kg	11
Acetone	11	U	ug/kg	11
Carbon disulfide	11	U	ug/kg	11
1,1-Dichloroethene	11	U	ug/kg	11
1,1-Dichloroethane	11	U	ug/kg	11
1,2-Dichloroethene (total)	11	U	ug/kg	11
Chloroform	11	U	ug/kg	11
1,2-Dichloroethane	11	U	ug/kg	11
2-Butanone	11	U	ug/kg	11
1,1,1-Trichloroethane	11	U	ug/kg	11
Carbon tetrachloride	11	U	ug/kg	11
Bromodichloromethane	11	U	ug/kg	11
1,2-Dichloropropane	11	U	ug/kg	11
cis-1,3-Dichloropropene	11	U	ug/kg	11
Trichloroethene	11	U	ug/kg	11
Dibromochloromethane	11	U	ug/kg	11
1,1,2-Trichloroethane	11	U	ug/kg	11
Benzene	11	U	ug/kg	11
trans-1,3-Dichloropropene	11	U	ug/kg	11
Bromoform	11	U	ug/kg	11
4-Methyl-2-pentanone	11	U	ug/kg	11
2-Hexanone	11	U	ug/kg	11
Tetrachloroethene	11	U	ug/kg	11
Toluene	11	U	ug/kg	11
1,1,2,2-Tetrachloroethane	11	U	ug/kg	11
Chlorobenzene	11	U	ug/kg	11
Ethylbenzene	11	U	ug/kg	11
Styrene	11	U	ug/kg	11
Xylenes (total)	11	U	ug/kg	11
CLP SEMIVOLATILES 90-SOW	ug/kg			
Phenol	370	U	ug/kg	370
bis(2-Chloroethyl) ether	370	U	ug/kg	370
2-Chlorophenol	370	U	ug/kg	370
1,3-Dichlorobenzene	370	U	ug/kg	370
1,4-Dichlorobenzene	370	U	ug/kg	370

Naval Air Station Whiting Field, Milton, Florida
Site 13 Surface Soil Data

Lab Sample Number:	G8895006			
Site	WHITING			
Locator	13S00501			
Collect Date:	08-DEC-95			
	VALUE	QUAL	UNITS	DL
1,2-Dichlorobenzene	370	U	ug/kg	370
2-Methylphenol	370	U	ug/kg	370
2,2-oxybis(1-Chloropropane)	370	U	ug/kg	370
4-Methylphenol	370	U	ug/kg	370
N-Nitroso-di-n-propylamine	370	U	ug/kg	370
Hexachloroethane	370	U	ug/kg	370
Nitrobenzene	370	UJ	ug/kg	370
Isophorone	370	U	ug/kg	370
2-Nitrophenol	370	U	ug/kg	370
2,4-Dimethylphenol	370	U	ug/kg	370
bis(2-Chloroethoxy) methane	370	U	ug/kg	370
2,4-Dichlorophenol	370	U	ug/kg	370
1,2,4-Trichlorobenzene	370	U	ug/kg	370
Naphthalene	370	U	ug/kg	370
4-Chloroaniline	370	U	ug/kg	370
Hexachlorobutadiene	370	U	ug/kg	370
4-Chloro-3-methylphenol	370	U	ug/kg	370
2-Methylnaphthalene	370	U	ug/kg	370
Hexachlorocyclopentadiene	370	U	ug/kg	370
2,4,6-Trichlorophenol	370	U	ug/kg	370
2,4,5-Trichlorophenol	920	U	ug/kg	920
2-Chloronaphthalene	370	U	ug/kg	370
2-Nitroaniline	920	U	ug/kg	920
Dimethylphthalate	370	U	ug/kg	370
Acenaphthylene	370	U	ug/kg	370
2,6-Dinitrotoluene	370	U	ug/kg	370
3-Nitroaniline	920	U	ug/kg	920
Acenaphthene	370	U	ug/kg	370
2,4-Dinitrophenol	920	UJ	ug/kg	920
4-Nitrophenol	920	U	ug/kg	920
Dibenzofuran	370	U	ug/kg	370
2,4-Dinitrotoluene	370	U	ug/kg	370
Diethylphthalate	370	U	ug/kg	370
4-Chlorophenyl-phenylether	370	U	ug/kg	370
Fluorene	370	U	ug/kg	370
4-Nitroaniline	920	U	ug/kg	920
4,6-Dinitro-2-methylphenol	920	UJ	ug/kg	920
N-Nitrosodiphenylamine	370	U	ug/kg	370
4-Bromophenyl-phenylether	370	U	ug/kg	370
Hexachlorobenzene	370	U	ug/kg	370
Pentachlorophenol	920	UJ	ug/kg	920
Phenanthrene	370	U	ug/kg	370
Anthracene	370	U	ug/kg	370
Carbazole	370	U	ug/kg	370
Di-n-butylphthalate	370	U	ug/kg	370
Fluoranthene	370	U	ug/kg	370
Pyrene	370	U	ug/kg	370
Butylbenzylphthalate	370	U	ug/kg	370
3,3-Dichlorobenzidine	370	U	ug/kg	370
Benzo (a) anthracene	370	U	ug/kg	370
Chrysene	370	U	ug/kg	370
bis(2-Ethylhexyl) phthalate	370	U	ug/kg	370

Naval Air Station Whiting . .d, Milton, Florida
Site 13 Surface Soil Data

Lab Sample Number:		G8895006		
Site		WHITING		
Locator		13S00501		
Collect Date:		08-DEC-95		
	VALUE	QUAL	UNITS	DL
Di-n-octylphthalate	370	U	ug/kg	370
Benzo (b) fluoranthene	370	U	ug/kg	370
Benzo (k) fluoranthene	370	UJ	ug/kg	370
Benzo (a) pyrene	370	U	ug/kg	370
Indeno (1,2,3-cd) pyrene	370	U	ug/kg	370
Dibenzo (a,h) anthracene	370	U	ug/kg	370
Benzo (g,h,i) perylene	370	U	ug/kg	370
CLP PESTICIDES/PCBS 90-SOW ug/kg				
alpha-BHC	1.9	U	ug/kg	1.9
beta-BHC	1.9	U	ug/kg	1.9
delta-BHC	1.9	U	ug/kg	1.9
gamma-BHC (Lindane)	1.9	U	ug/kg	1.9
Heptachlor	1.9	U	ug/kg	1.9
Aldrin	1.9	U	ug/kg	1.9
Heptachlor epoxide	1.9	U	ug/kg	1.9
Endosulfan I	1.9	U	ug/kg	1.9
Dieldrin	3.6	U	ug/kg	3.6
4,4-DDE	3.6	U	ug/kg	3.6
Endrin	3.6	U	ug/kg	3.6
Endosulfan II	3.6	U	ug/kg	3.6
4,4-DDD	3.6	U	ug/kg	3.6
Endosulfan sulfate	3.6	U	ug/kg	3.6
4,4-DDT	3.6	U	ug/kg	3.6
Methoxychlor	19	U	ug/kg	19
Endrin ketone	3.6	U	ug/kg	3.6
Endrin aldehyde	3.6	U	ug/kg	3.6
alpha-Chlordane	1.9	U	ug/kg	1.9
gamma-Chlordane	1.9	U	ug/kg	1.9
Toxaphene	190	U	ug/kg	190
Aroclor-1016	36	U	ug/kg	36
Aroclor-1221	74	U	ug/kg	74
Aroclor-1232	36	U	ug/kg	36
Aroclor-1242	36	U	ug/kg	36
Aroclor-1248	36	U	ug/kg	36
Aroclor-1254	36	U	ug/kg	36
Aroclor-1260	36	U	ug/kg	36
CLP METALS AND CYANIDE mg/kg				
Aluminum	9430		mg/kg	40
Antimony	12	UJ	mg/kg	12
Arsenic	1.6	J	mg/kg	2
Barium	11.9	J	mg/kg	40
Beryllium	1	UJ	mg/kg	1
Cadmium	1	U	mg/kg	1
Calcium	44.7	J	mg/kg	1000
Chromium	6.9		mg/kg	2
Cobalt	.96	J	mg/kg	10
Copper	5	UJ	mg/kg	5
Iron	5620		mg/kg	20
Lead	4.7	J	mg/kg	.6
Magnesium	115	J	mg/kg	1000

Naval Air Station Whiting Field, Milton, Florida
Site 13 Surface Soil Data

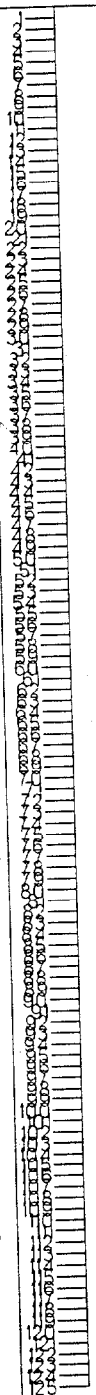
Lab Sample Number:	G8895006			
Site	WHITING			
Locator	13S00501			
Collect Date:	08-DEC-95			
	VALUE	QUAL	UNITS	DL
Manganese	159	J	mg/kg	3
Mercury	.02	J	mg/kg	.1
Nickel	3.3	J	mg/kg	8
Potassium	1000	U	mg/kg	1000
Selenium	1	UJ	mg/kg	1
Silver	2	U	mg/kg	2
Sodium	1000	UJ	mg/kg	1000
Thallium	2	U	mg/kg	2
Vanadium	14.5		mg/kg	10
Zinc	4	U	mg/kg	4
Cyanide	.5	U	mg/kg	.5
Total petroleum hydrocarbons	-		mg/kg	
Total organic carbon	-		mg/kg	

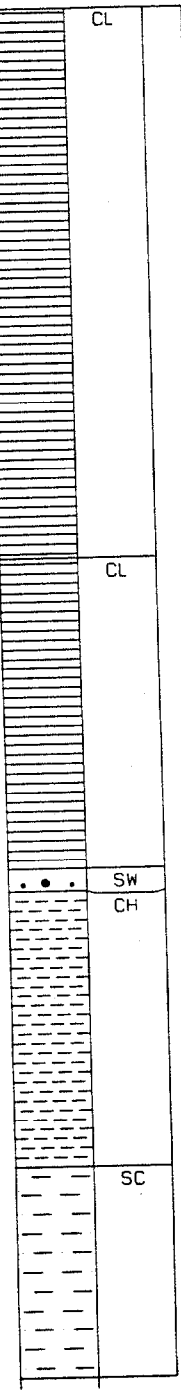
APPENDIX C

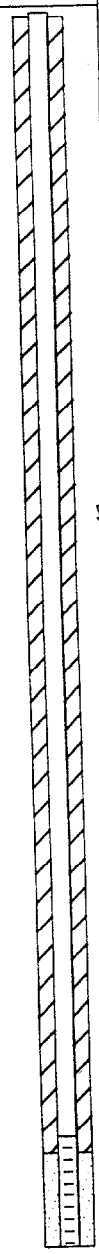
BORING LOGS

TITLE: NAS WHITING FIELD RI	LOG of WELL: WHF-13-1	BORING NO.
CLIENT: SDIV NAVY		PROJECT NO: 6500-01
CONTRACTOR: GERAGHTY & MILLER	DATE STARTED: NA	COMPLTD: NA
METHOD: MUD-ROTARY	CASE SIZE: 4-INCH / SCREEN INT.: 10-INCH	PROTECTION LEVEL: D
TOC ELEV.: 103.57 FT.	MONITOR INST.: NA / TOT DPTH: 112.5FT.	DPTH TO ▽ 46.69 FT.
LOGGED BY: NA	WELL DEVELOPMENT DATE: NA	SITE: WHITING FIELD

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					CLAY-red/gray clay w/ some fine to medium sand		CL		
					CLAY-light gray clay w/ some buff fine sand		CL		
					SAND-buff fine to coarse sand		SW		
					CLAY-light gray clay		CH		
					SAND-buff fine to coarse sand w/ some gravel and light gray clay		SC		







HARDING LAWSON ASSOCIATES

TITLE: Naval Air Station Whiting Field	LOG of WELL: WHF-13-1S	BORING NO.
		PROJECT NO: RI PHASE IIA
CLIENT: SOUTHNAVFACENGCOM		
CONTRACTOR: Groundwater Protection Inc.	DATE STARTED: 7/19/93	COMPLTD: 7/20/93
METHOD: MUD ROTARY	CASE SIZE: 2"	SCREEN INT.: 43-58 FT	PROTECTION LEVEL: D
TOC ELEV.: 109.47 FT.	MONITOR INST.: OVA	TOT DPTH: 60FT.	DPTH TO ∇ 55.8 FT.
LOGGED BY: N. Roka	WELL DEVELOPMENT DATE:		SITE: 13

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5–6			24/24	0.2	SILT - red, very fine, medium dense, very soft, wet.		ML	8,9,12,14	
10–11			20/24	0.9	CLAYEY SILT - red, slightly moist, firm, some sand.		ML	8,9,10,13	
15–16			24/24	1.4	Same as above, yellow and red mottled, no clay.		ML	7,9,11,14	
20–21			19/24	0.2	Same as above, some clay.		ML	5,5,7,9	
25–26			12/24	0.6	Same as of above. SAND - light tan to orange, fine to medium, poorly graded, dense, moist, subrounded.		ML/SP	12,16,18,19	
30–31			14/24	1.6	SAND - white to tan to orange, very fine, silt, medium dense, dry.		SP	11,12,15,17	
35–36			12/24	4.5	Same as above, light tan to yellow.		SP	11,14,17,22	
40				1.4			SP	12,14,18,24	

HARDING LAWSON ASSOCIATES

TITLE: Naval Air Station Whiting Field		LOG of WELL: WHF-13-1S	BORING NO.
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: RI PHASE IIA
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 7/19/93	COMPLTD: 7/20/93
METHOD: MUD ROTARY	CASE SIZE: 2"	SCREEN INT.: 43-58 FT	PROTECTION LEVEL: D
TOC ELEV.: 109.47 FT.	MONITOR INST.: OVA	TOT DPTH: 60FT.	DPTH TO ∇ 55.8 FT.
LOGGED BY: N. Roka	WELL DEVELOPMENT DATE:		SITE: 13

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Continued from PAGE 1				
41			13/24		SAND - rust to light tan to white to yellow to white to yellow to red, fine, poorly graded, moist to saturated.		SP		
42									
43									
44									
45				0.8	SAND - rust to mustard yellow, fine to medium, poorly graded, dense, saturated, subrounded to subangular.		SP	12,14,16,15	
46			12/24						
47									
48									
49									
50				BKG	CLAY - gray to red and yellow mottling, fat, firm, stiff, grade to sandy clay.		SP	14,18,23,28	
51			24/24		SAND - red, fine to medium, poorly graded, dense, saturated, subangular.				
52									
53									
54									
55				10	SAND - purple, fine to medium, poorly graded, medium dense, saturated, subangular.		SP	6,12,9,11	∇
56			13/24						
57									
58									
59									
60									
61									
62									
63									
64									
65									
66									
67									
68									
69									
70									
71									
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74									
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76									
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HARDING LAWSON ASSOCIATES

TITLE: Naval Air Station Whiting Field		LOG of WELL: WHF-13-2	BORING NO.
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: RI PHASE IIA
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 3/10/93	COMPLTD: 3/18/93
METHOD: MUD ROTARY	CASE SIZE: 2"	SCREEN INT.: 54-69	PROTECTION LEVEL: D
TOC ELEV.: 102.92 FT.	MONITOR INST.: OVA	TOT DPTH: 71FT.	DPTH TO ▽ 52.26 FT.
LOGGED BY: G. Kanchibhatla	WELL DEVELOPMENT DATE:		SITE: 13

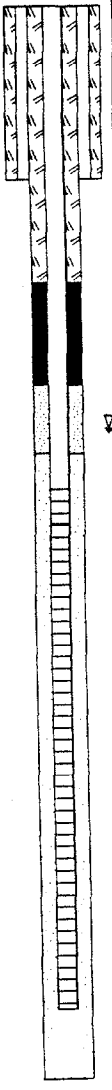
DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
4–5			08/24	0	SILTY SAND - reddish brown, fine poorly graded, dry.		SM	2,3,5,9	
9–10			08/24	0	Same as above, moderately dense, dry.		SM	5,5,7,8	
14–15			18/24	0	SAND - reddish brown, fine, poorly graded, moderately dense, dry.		SP	7,9,11,8	
19–20			10/24	0	SAND - yellowish orange to tan, fine, trace coarse, poorly graded, medium dense, dry.		SP	11,11,13,14	
24–25			10/24	0	Same as above, some medium, dry.		SP	9,15,19,12	
29–30			10/24	0	CLAY - yellowish orange, gray mottling, soft, dry, low plasticity.		CL	11,8,6,9	
31–32			20/24	0	SILTY CLAY - Same as above.			2,2,3,4	
33–34			20/24	0	Same as above, bottom 2" red and gray mottling.			3,2,1,2	
35–36			14/24	0	CLAY - red, gray mottling, soft, slightly moist, low plasticity.			2,2,3,2	
39–40			20/24	0	CLAY - some silt, soft, slightly moist, low plasticity, bottom 3" red and gray mottling.		CL	1,1,1,1	

HARDING LAWSON ASSOCIATES

TITLE: Naval Air Station Whiting Field		LOG of WELL: WHF-13-2	BORING NO.
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: RI PHASE IIA
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 3/10/93	COMPLTD: 3/18/93
METHOD: MUD ROTARY	CASE SIZE: 2"	SCREEN INT.: 54-69	PROTECTION LEVEL: D
TOC ELEV.: 102.92 FT.	MONITOR INST.: OVA	TOT DPTH: 71FT.	DPTH TO ∇ 52.26 FT.
LOGGED BY: G. Kanchibhatla	WELL DEVELOPMENT DATE:		SITE: 13

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN
					Continued from PAGE 1			
41			20/24				CL	
42								
43				0	CLAY - red and gray mottling, medium stiff, dry, plastic.		CL	2,3,2,4
44			22/24					
45				0	CLAY - medium gray to purple.		CL	NA
46			24/24					
47								
48				0	SAND - top 6" brown, fine, grade to CLAY, 10", gray to orange, hard, bottom 2", SAND.		SP	NA
49			18/24					
50								
51								
52								
53				0	CLAYEY SAND - reddish brown to gray to purple to brownish yellow, fine.		CL	NA
54			15/24				SP/CL	
55				0	Same as above.			NA
56			15/24					
57								
58				0	Same as above.		SP	NA
59			15/24					
60								
61								
62								
63				1	SAND - light gray with some orange and red bands, fine.		SP	NA
64			15/24					
65								
66								
67								
68								
69								
70								
71								
72								
73								
74								
75								
76								
77								
78								
79								
80								

WELL DATA



HARDING LAWSON ASSOCIATES

TITLE: Naval Air Station Whiting Field	LOG of WELL:	BORING NO. TEST PIT 13-01
		PROJECT NO: RI PHASE IIA
CLIENT: SOUTHNAVFACENGCOM		
CONTRACTOR: UXB Inc.	DATE STARTED: 10/6/92	COMPLTD: 10/6/92
METHOD: BACK HOE	CASE SIZE: / SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: FID,LEL,RM / TOT DPTH: 4FT.	DPTH TO ▽ FT.
LOGGED BY: G. Kanchibhatla	WELL DEVELOPMENT DATE: N/A	SITE:

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					CLAYEY SAND - reddish orange		SC		
1		◆	0		CLAY - dark olive green, wood.		CL/FILL		
2		◆	0		CLAY - SAA, metal cans, paper, plastic.				
3		◆	0		CLAY - brick red, hard metal form.				
4		◆	0-5	2					
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									

HARDING LAWSON ASSOCIATES

TITLE: Naval Air Station Whiting Field		LOG of WELL:	BORING NO. TEST PIT 13-02
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: RI PHASE IIA
CONTRACTOR: UXB Inc.		DATE STARTED: 10/6/92	COMPLTD: 10/6/92
METHOD: BACK HOE	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: FID,LEL,RM	TOT DPTH: 12.5FT.	DPTH TO ▽ FT.
LOGGED BY: G. Kanchibhatla	WELL DEVELOPMENT DATE: N/A		SITE:

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					CLAYEY SAND - bright red.		SC		
1		◆	0						
2									
3					CLAYEY SAND - SAA.				
4		◆	0						
5					CLAYEY SAND - SAA.				
6									
7		◆	0						
8									
9									
10		◆	0		SAND - yellowish orange, very fine to fine.		SP		
11					SAND - tan to white.				
12		◆	0						
13									
14									
15									

HARDING LAWSON ASSOCIATES

TITLE: Naval Air Station Whiting Field	LOG of WELL:	BORING NO. TEST PIT 13-03
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: RI PHASE IIA
CONTRACTOR: UXB Inc.	DATE STARTED: 10/6/92	COMPLTD: 10/6/92
METHOD: BACK HOE	CASE SIZE: / SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: FID,LEL,RM / TOT DPTH: 10FT.	DPTH TO ▽ FT.
LOGGED BY: G. Kanchibhatla	WELL DEVELOPMENT DATE: N/A	SITE:

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
		◆	0		CLAYEY SAND - brick red, very fine to fine.		SC		
1					CLAYEY SAND - tan to white.				
		◆	0						
2					FILL - paper, broken glass, plastic.		FILL		
		◆	0		CLAYEY SAND - olive green, very fine to fine, newspaper Nov. 6, '82.		SC/FILL		
		◆			CLAYEY SAND - brick red, metal & aluminum cans, plastic, newspaper.				
3		◆	0						
4					CLAYEY SAND - olive green, very fine to fine, clean layer.				
		◆	0						
5				5	CLAYEY SAND - brick red, rubber innertube.				
		◆	5						
6					SECOND LAYER OF GARBAGE.				
		◆	0						
7					CLAYEY SAND - olive green.				
		◆	0						
8					CLAYEY SAND - brick red.				
9		◆	0						
10									
11									
12									
13									
14									
15									

HARDING LAWSON ASSOCIATES

TITLE: Naval Air Station Whiting Field	LOG of WELL:	BORING NO. TEST PIT 13-04
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: RI PHASE IIA
CONTRACTOR: UXB Inc.	DATE STARTED: 10/6/92	COMPLTD: 10/6/92
METHOD: BACK HOE	CASE SIZE: / SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: FID,LEL,RM / TOT DPTH: 10FT.	DPTH TO ∇ FT.
LOGGED BY: G. Kanchibhatla	WELL DEVELOPMENT DATE: N/A	SITE:

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					CLAYEY SAND - brick red.		SC		
1		◆	0						
2					CLAY - olive green, construction rubble, asphalt, boulders.		CL/FILL		
3		◆	0						
4					CLAYEY SAND - brick red.		SC		
		◆	0						
5					CLAYEY SAND - SAA.				
		◆	0						
6					CLAYEY SAND - SAA.				
		◆	1						
7					CLAYEY SAND - SAA.				
		◆	0						
8					CLAYEY SAND - SAA.				
9		◆	0						
10									
11									
12									
13									
14									
15									

HARDING LAWSON ASSOCIATES

TITLE: Naval Air Station Whiting Field	LOG of WELL:		BORING NO. TEST PIT 13-05
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: RI PHASE IIA
CONTRACTOR: UXB Inc.		DATE STARTED: 10/6/92	COMPLTD: 10/6/92
METHOD: BACK HOE	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: FID,LEL,RM	TOT DPTH: 10FT.	DPTH TO ▽ FT.
LOGGED BY: G. Kanchibhatla	WELL DEVELOPMENT DATE: N/A		SITE:

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
		◆	0		SAND - tan, very fine to fine.		SP		
1				100	CLAYEY SAND - brick red.		SC		
		◆	100						
2									
		◆	0						
3					FILL - paper plastic, styrofoam, spoons, bottles.		FILL		
4									
5		◆	0						
6									
7									
8					SANDY CLAY - tan, clean layer.		SC		
			0						
9		◆	N/A						
10					SANDY CLAY - tan.				
		◆	0						
11									
12									
13									
14									
15									

HARDING LAWSON ASSOCIATES

APPENDIX D

GROUNDWATER ANALYTICAL DATA

Naval Air Station Whiting Field, Milton, Florida
Site 13 Groundwater Data

Lab Sample Number:	90198002			RC092002			RC092003			90198001		
Site	WHITING			WHITING			WHITING			WHITING		
Locator	WHF13-1			13G00101			13G00102			WHF13-1B		
Collect Date:	02-NOV-93			09-SEP-96			09-SEP-96			02-NOV-93		
	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL
CLP VOLATILES 90-SOW ug/l												
Chloromethane	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
Bromomethane	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
Vinyl chloride	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
Chloroethane	10 U	ug/l	10	10 UJ	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
Methylene chloride	10 U	ug/l	10	10 UJ	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
Acetone	10 UJ	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 UJ	ug/l	10
Carbon disulfide	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
1,1-Dichloroethene	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
1,1-Dichloroethane	10 U	ug/l	10	9 J	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
1,2-Dichloroethene (total)	10 U	ug/l	10	5 J	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
Chloroform	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
1,2-Dichloroethane	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
2-Butanone	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
1,1,1-Trichloroethane	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
Carbon tetrachloride	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
Bromodichloromethane	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
1,2-Dichloropropane	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
cis-1,3-Dichloropropene	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
Trichloroethene	10 U	ug/l	10	7 J	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
Dibromochloromethane	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
1,1,2-Trichloroethane	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
Benzene	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
trans-1,3-Dichloropropene	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
Bromoform	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
4-Methyl-2-pentanone	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
2-Hexanone	10 U	ug/l	10	10 U	ug/l	10	10 UJ	ug/l	10	10 U	ug/l	10
Tetrachloroethene	10 U	ug/l	10	1 J	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
Toluene	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
1,1,2,2-Tetrachloroethane	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
Chlorobenzene	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
Ethylbenzene	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
Styrene	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
Xylenes (total)	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
CLP SEMIVOLATILES 90-SOW ug/l												
Phenol	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 UJ	ug/l	10
bis(2-Chloroethyl) ether	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
2-Chlorophenol	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
1,3-Dichlorobenzene	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
1,4-Dichlorobenzene	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
1,2-Dichlorobenzene	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
2-Methylphenol	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
2,2-oxybis(1-Chloropropane)	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
4-Methylphenol	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
N-Nitroso-di-n-propylamine	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
Hexachloroethane	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
Nitrobenzene	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
Isophorone	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
2-Nitrophenol	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10
2,4-Dimethylphenol	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10	10 U	ug/l	10

Naval Air Station Whiting Field, Milton, Florida
Site 13 Groundwater Data

Lab Sample Number:	90198002				RC092002				RC092003				90198001			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	WHF13-1				13G00101				13G00102				WHF13-1B			
Collect Date:	02-NOV-93				09-SEP-96				09-SEP-96				02-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
bis(2-Chloroethoxy) methane	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,4-Dichlorophenol	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
1,2,4-Trichlorobenzene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Naphthalene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
4-Chloroaniline	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Hexachlorobutadiene	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	UJ	ug/l	10
4-Chloro-3-methylphenol	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2-Methylnaphthalene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Hexachlorocyclopentadiene	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	UJ	ug/l	10
2,4,6-Trichlorophenol	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,4,5-Trichlorophenol	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
2-Chloronaphthalene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2-Nitroaniline	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
Dimethylphthalate	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Acenaphthylene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,6-Dinitrotoluene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
3-Nitroaniline	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
Acenaphthene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,4-Dinitrophenol	25	UJ	ug/l	25	25	U	ug/l	25	25	U	ug/l	25	25	UJ	ug/l	25
4-Nitrophenol	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
Dibenzofuran	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,4-Dinitrotoluene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Diethylphthalate	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
4-Chlorophenyl-phenylether	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Fluorene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
4-Nitroaniline	25	UJ	ug/l	25	25	U	ug/l	25	25	U	ug/l	25	25	UJ	ug/l	25
4,6-Dinitro-2-methylphenol	25	UJ	ug/l	25	25	U	ug/l	25	25	U	ug/l	25	25	UJ	ug/l	25
N-Nitrosodiphenylamine	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
4-Bromophenyl-phenylether	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Hexachlorobenzene	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	UJ	ug/l	10
Pentachlorophenol	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
Phenanthrene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Anthracene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Carbazole	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Di-n-butylphthalate	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Fluoranthene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Pyrene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Butylbenzylphthalate	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
3,3-Dichlorobenzidine	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Benzo (a) anthracene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Chrysene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
bis(2-Ethylhexyl) phthalate	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Di-n-octylphthalate	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Benzo (b) fluoranthene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Benzo (k) fluoranthene	10	U	ug/l	10	10	UJ	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10
Benzo (a) pyrene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Indeno (1,2,3-cd) pyrene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Dibenzo (a,h) anthracene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Benzo (g,h,i) perylene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
CLP PESTICIDES/PCBS 90-SOW ug/l																
alpha-BHC	.05	UJ	ug/l	.05	.05	UJ	ug/l	.05	.05	U	ug/l	.05	.05	UJ	ug/l	.05

Naval Air Station Whiting [illegible]d, Milton, Florida
Site 13 Ground[illegible]er Data

Lab Sample Number:		90198002				RC092002				RC092003				90198001			
Site		WHITING				WHITING				WHITING				WHITING			
Locator		WHF13-1				13G00101				13G00102				WHF13-1B			
Collect Date:		02-NOV-93				09-SEP-96				09-SEP-96				02-NOV-93			
		VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
beta-BHC		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05	.05	U	ug/l	.05	.05	UJ	ug/l	.05
delta-BHC		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05	.05	U	ug/l	.05	.05	UJ	ug/l	.05
gamma-BHC (Lindane)		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05	.05	U	ug/l	.05	.05	UJ	ug/l	.05
Heptachlor		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05	.05	U	ug/l	.05	.05	UJ	ug/l	.05
Aldrin		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05	.05	U	ug/l	.05	.05	UJ	ug/l	.05
Heptachlor epoxide		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05	.05	U	ug/l	.05	.05	UJ	ug/l	.05
Endosulfan I		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05	.05	U	ug/l	.05	.05	UJ	ug/l	.05
Dieldrin		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1	.1	U	ug/l	.1	.1	UJ	ug/l	.1
4,4-DDE		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1	.1	U	ug/l	.1	.1	UJ	ug/l	.1
Endrin		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1	.1	U	ug/l	.1	.1	UJ	ug/l	.1
Endosulfan II		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1	.1	U	ug/l	.1	.1	UJ	ug/l	.1
4,4-DDD		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1	.1	U	ug/l	.1	.1	UJ	ug/l	.1
Endosulfan sulfate		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1	.1	U	ug/l	.1	.1	UJ	ug/l	.1
4,4-DDT		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1	.1	U	ug/l	.1	.1	UJ	ug/l	.1
Methoxychlor		.5	UJ	ug/l	.5	.5	UJ	ug/l	.5	.5	U	ug/l	.5	.5	UJ	ug/l	.5
Endrin ketone		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1	.1	U	ug/l	.1	.1	UJ	ug/l	.1
Endrin aldehyde		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1	.1	U	ug/l	.1	.1	UJ	ug/l	.1
alpha-Chlordane		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05	.05	U	ug/l	.05	.05	UJ	ug/l	.05
gamma-Chlordane		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05	.05	U	ug/l	.05	.05	UJ	ug/l	.05
Toxaphene		5	UJ	ug/l	5	5	UJ	ug/l	5	5	U	ug/l	5	5	UJ	ug/l	5
Aroclor-1016		1	UJ	ug/l	1	1	UJ	ug/l	1	1	U	ug/l	1	1	UJ	ug/l	1
Aroclor-1221		2	UJ	ug/l	2	2	UJ	ug/l	2	2	U	ug/l	2	2	UJ	ug/l	2
Aroclor-1232		1	UJ	ug/l	1	1	UJ	ug/l	1	1	U	ug/l	1	1	UJ	ug/l	1
Aroclor-1242		1	UJ	ug/l	1	1	UJ	ug/l	1	1	U	ug/l	1	1	UJ	ug/l	1
Aroclor-1248		1	UJ	ug/l	1	1	UJ	ug/l	1	1	U	ug/l	1	1	UJ	ug/l	1
Aroclor-1254		1	UJ	ug/l	1	1	UJ	ug/l	1	1	U	ug/l	1	1	UJ	ug/l	1
Aroclor-1260		1	UJ	ug/l	1	1	UJ	ug/l	1	1	U	ug/l	1	1	UJ	ug/l	1
CLP METALS AND CYANIDE	ug/l																
Aluminum		100	J	ug/l	200	81.6	J	ug/l		206		ug/l		8740		ug/l	200
Antimony		20.7	U	ug/l	60	8.6	U	ug/l		8.6	U	ug/l		20.7	U	ug/l	60
Arsenic		1.6	U	ug/l	10	1.1	J	ug/l		.5	U	ug/l		2.3	J	ug/l	10
Barium		84.3	J	ug/l	200	114	J	ug/l		64.9	J	ug/l		82	J	ug/l	200
Beryllium		.2	UJ	ug/l	5	.3	U	ug/l		.3	U	ug/l		.2	UJ	ug/l	5
Cadmium		3.2	U	ug/l	5	1.2	U	ug/l		1.2	U	ug/l		3.2	U	ug/l	5
Calcium		24500		ug/l	5000	8440		ug/l		44900		ug/l		28000		ug/l	5000
Chromium		3.3	U	ug/l	10	2	U	ug/l		2	U	ug/l		19.1		ug/l	10
Cobalt		4.1	U	ug/l	50	3.2	U	ug/l		2.3	U	ug/l		4.1	U	ug/l	50
Copper		2.1	U	ug/l	25	1.1	U	ug/l		1.2	J	ug/l		11	J	ug/l	25
Iron		9910		ug/l	100	39600		ug/l		296		ug/l		16000		ug/l	100
Lead		1.9	J	ug/l	3	.6	J	ug/l		2.2	J	ug/l		3.6		ug/l	3
Magnesium		2810	J	ug/l	5000	5180		ug/l		5890		ug/l		3410	J	ug/l	5000
Manganese		111		ug/l	15	78.1		ug/l		753		ug/l		142		ug/l	15
Mercury		.22		ug/l	.2	.1	U	ug/l		.1	U	ug/l		.15	U	ug/l	.2
Nickel		9	U	ug/l	40	7.3	U	ug/l		7.3	U	ug/l		9	U	ug/l	40
Potassium		1580	J	ug/l	5000	1520	J	ug/l		717	J	ug/l		1660	J	ug/l	5000
Selenium		2	U	ug/l	5	.6	U	ug/l		.6	U	ug/l		2	U	ug/l	5
Silver		2.7	U	ug/l	10	2.5	U	ug/l		2.5	U	ug/l		2.7	U	ug/l	10
Sodium		2420	J	ug/l	5000	6620		ug/l		8170		ug/l		8280		ug/l	5000
Thallium		.88	U	ug/l	10	.6	U	ug/l		.6	U	ug/l		.88	U	ug/l	10
Vanadium		2.5	U	ug/l	50	1.2	U	ug/l		2.3	U	ug/l		43.4	J	ug/l	50
Zinc		239		ug/l	20	9	J	ug/l		735		ug/l		21.6		ug/l	20

Naval Air Station Whiting Field, Milton, Florida
Site 13 Groundwater Data

Lab Sample Number:	90198002				RC092002				RC092003				90198001			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	WHF13-1				13G00101				13G00102				WHF13-1B			
Collect Date:	02-NOV-93				09-SEP-96				09-SEP-96				02-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Cyanide	1.7	U	ug/l	10	1.8	U	ug/l		1.8	U	ug/l		1.7	U	ug/l	10

Naval Air Station Whiting Field, Milton, Florida
Site 13 Groundwater Data

Lab Sample Number:		RC092005			RC092010			90198003			RC092004		
Site		WHITING			WHITING			WHITING			WHITING		
Locator		13G00103			13G00103F			WHF13-2			13G00201		
Collect Date:		10-SEP-96			10-SEP-96			02-NOV-93			10-SEP-96		
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	
CLP VOLATILES 90-SOW	ug/l												
Chloromethane		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
Bromomethane		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
Vinyl chloride		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
Chloroethane		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
Methylene chloride		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
Acetone		22 U	ug/l	22	-		ug/l	10	70 J	ug/l	10	3 J	ug/l
Carbon disulfide		1 J	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
1,1-Dichloroethene		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
1,1-Dichloroethane		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
1,2-Dichloroethene (total)		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
Chloroform		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
1,2-Dichloroethane		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
2-Butanone		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
1,1,1-Trichloroethane		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
Carbon tetrachloride		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
Bromodichloromethane		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
1,2-Dichloropropane		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
cis-1,3-Dichloropropene		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
Trichloroethene		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
Dibromochloromethane		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
1,1,2-Trichloroethane		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
Benzene		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 UJ	ug/l
trans-1,3-Dichloropropene		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
Bromoform		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
4-Methyl-2-pentanone		10 UJ	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
2-Hexanone		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
Tetrachloroethene		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
Toluene		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
1,1,2,2-Tetrachloroethane		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
Chlorobenzene		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
Ethylbenzene		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
Styrene		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
Xylenes (total)													
CLP SEMIVOLATILES 90-SOW	ug/l												
Phenol		10 U	ug/l	10	-		ug/l	10	10 UJ	ug/l	10	10 U	ug/l
bis(2-Chloroethyl) ether		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
2-Chlorophenol		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
1,3-Dichlorobenzene		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l
1,4-Dichlorobenzene		10 U	ug/l	10	-		ug/l	10	10 U	ug/l	10	10 U	ug/l

Naval Air Station Whiting Field, Milton, Florida
Site 13 Groundwater Data

Lab Sample Number:	RC092005				RC092010				90198003				RC092004			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	13G00103				13G00103F				WHF13-2				13G00201			
Collect Date:	10-SEP-96				10-SEP-96				02-NOV-93				10-SEP-96			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
1,2-Dichlorobenzene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
2-Methylphenol	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
2,2-oxybis(1-Chloropropane)	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
4-Methylphenol	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
N-Nitroso-di-n-propylamine	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Hexachloroethane	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Nitrobenzene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Isophorone	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
2-Nitrophenol	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
2,4-Dimethylphenol	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
bis(2-Chloroethoxy) methane	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
2,4-Dichlorophenol	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
1,2,4-Trichlorobenzene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Naphthalene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
4-Chloroaniline	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Hexachlorobutadiene	10	U	ug/l	10	-		ug/l		10	UJ	ug/l	10	10	U	ug/l	10
4-Chloro-3-methylphenol	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
2-Methylnaphthalene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Hexachlorocyclopentadiene	10	U	ug/l	10	-		ug/l		10	UJ	ug/l	10	10	U	ug/l	10
2,4,6-Trichlorophenol	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
2,4,5-Trichlorophenol	25	U	ug/l	25	-		ug/l		25	U	ug/l	25	25	U	ug/l	25
2-Chloronaphthalene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
2-Nitroaniline	25	U	ug/l	25	-		ug/l		25	U	ug/l	25	25	U	ug/l	25
Dimethylphthalate	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Acenaphthylene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
2,6-Dinitrotoluene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
3-Nitroaniline	25	U	ug/l	25	-		ug/l		25	U	ug/l	25	25	U	ug/l	25
Acenaphthene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
2,4-Dinitrophenol	25	U	ug/l	25	-		ug/l		25	UJ	ug/l	25	25	U	ug/l	25
4-Nitrophenol	25	U	ug/l	25	-		ug/l		25	U	ug/l	25	25	U	ug/l	25
Dibenzofuran	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
2,4-Dinitrotoluene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Diethylphthalate	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
4-Chlorophenyl-phenylether	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Fluorene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
4-Nitroaniline	25	U	ug/l	25	-		ug/l		25	UJ	ug/l	25	25	U	ug/l	25
4,6-Dinitro-2-methylphenol	25	U	ug/l	25	-		ug/l		25	UJ	ug/l	25	25	U	ug/l	25
N-Nitrosodiphenylamine	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
4-Bromophenyl-phenylether	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Hexachlorobenzene	10	U	ug/l	10	-		ug/l		10	UJ	ug/l	10	10	U	ug/l	10
Pentachlorophenol	25	U	ug/l	25	-		ug/l		25	U	ug/l	25	25	U	ug/l	25
Phenanthrene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Anthracene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Carbazole	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Di-n-butylphthalate	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Fluoranthene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Pyrene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Butylbenzylphthalate	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
3,3-Dichlorobenzidine	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Benzo (a) anthracene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Chrysene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
bis(2-Ethylhexyl) phthalate	10	U	ug/l	10	-		ug/l		10		ug/l	10	10	U	ug/l	10

Naval Air Station Whiting Field, Milton, Florida
Site 13 Groundwater Data

Lab Sample Number:		RC092005				RC092010				90198003				RC092004			
Site		WHITING				WHITING				WHITING				WHITING			
Locator		13G00103				13G00103F				WHF13-2				13G00201			
Collect Date:		10-SEP-96				10-SEP-96				02-NOV-93				10-SEP-96			
		VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Di-n-octylphthalate		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Benzo (b) fluoranthene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Benzo (k) fluoranthene		10	UJ	ug/l	10	-		ug/l		10	U	ug/l	10	10	UJ	ug/l	10
Benzo (a) pyrene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Indeno (1,2,3-cd) pyrene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Dibenzo (a,h) anthracene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Benzo (g,h,i) perylene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
CLP PESTICIDES/PCBS 90-SOW	ug/l																
alpha-BHC		.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	U	ug/l	.05
beta-BHC		.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	U	ug/l	.05
delta-BHC		.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	U	ug/l	.05
gamma-BHC (Lindane)		.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	U	ug/l	.05
Heptachlor		.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	U	ug/l	.05
Aldrin		.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	U	ug/l	.05
Heptachlor epoxide		.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	U	ug/l	.05
Endosulfan I		.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	U	ug/l	.05
Dieldrin		.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	U	ug/l	.1
4,4-DDE		.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	U	ug/l	.1
Endrin		.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	U	ug/l	.1
Endosulfan II		.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	U	ug/l	.1
4,4-DDD		.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	U	ug/l	.1
Endosulfan sulfate		.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	U	ug/l	.1
4,4-DDT		.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	U	ug/l	.1
Methoxychlor		.5	U	ug/l	.5	-		ug/l		.5	UJ	ug/l	.5	.5	U	ug/l	.5
Endrin ketone		.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	U	ug/l	.1
Endrin aldehyde		.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	U	ug/l	.1
alpha-Chlordane		.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	U	ug/l	.05
gamma-Chlordane		.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	U	ug/l	.05
Toxaphene		5	U	ug/l	5	-		ug/l		5	UJ	ug/l	5	5	U	ug/l	5
Aroclor-1016		1	U	ug/l	1	-		ug/l		1	UJ	ug/l	1	1	U	ug/l	1
Aroclor-1221		2	U	ug/l	2	-		ug/l		2	UJ	ug/l	2	2	U	ug/l	2
Aroclor-1232		1	U	ug/l	1	-		ug/l		1	UJ	ug/l	1	1	U	ug/l	1
Aroclor-1242		1	U	ug/l	1	-		ug/l		1	UJ	ug/l	1	1	U	ug/l	1
Aroclor-1248		1	U	ug/l	1	-		ug/l		1	UJ	ug/l	1	1	U	ug/l	1
Aroclor-1254		1	U	ug/l	1	-		ug/l		1	UJ	ug/l	1	1	U	ug/l	1
Aroclor-1260		1	U	ug/l	1	-		ug/l		1	UJ	ug/l	1	1	U	ug/l	1
CLP METALS AND CYANIDE	ug/l																
Aluminum		82.4	J	ug/l		13.7	U	ug/l		111	J	ug/l	200	11.1	U	ug/l	
Antimony		8.6	U	ug/l		8.6	U	ug/l		20.7	U	ug/l	60	8.6	U	ug/l	
Arsenic		.5	U	ug/l		.5	U	ug/l		1.6	U	ug/l	10	.5	U	ug/l	
Barium		69.2	J	ug/l		66.6	J	ug/l		46	J	ug/l	200	33	J	ug/l	
Beryllium		.3	U	ug/l		.3	U	ug/l		.2	UJ	ug/l	5	.3	U	ug/l	
Cadmium		1.2	U	ug/l		1.2	U	ug/l		12.6		ug/l	5	1.2	U	ug/l	
Calcium		26400		ug/l		26500		ug/l		2860	J	ug/l	5000	1810	J	ug/l	
Chromium		2	U	ug/l		2	U	ug/l		3.3	U	ug/l	10	2	U	ug/l	
Cobalt		2.3	U	ug/l		2.8	U	ug/l		4.1	U	ug/l	50	2.3	U	ug/l	
Copper		1.1	U	ug/l		1.1	U	ug/l		3.9	J	ug/l	25	1.1	U	ug/l	
Iron		2780		ug/l		377		ug/l		141		ug/l	100	16.8	U	ug/l	
Lead		2.3	J	ug/l		.7	J	ug/l		1	U	ug/l	3	.6	J	ug/l	
Magnesium		2790	J	ug/l		2800	J	ug/l		1500	J	ug/l	5000	866	J	ug/l	

Naval Air Station Whiting Field, Milton, Florida
Site 13 Groundwater Data

Lab Sample Number:	RC092005				RC092010				90198003				RC092004			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	13G00103				13G00103F				WHF13-2				13G00201			
Collect Date:	10-SEP-96				10-SEP-96				02-NOV-93				10-SEP-96			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Manganese	17.5		ug/l		16.7		ug/l		28.6		ug/l	15	3.1	J	ug/l	
Mercury	.1	U	ug/l		.1	U	ug/l		.15	U	ug/l	.2	.1	U	ug/l	
Nickel	7.3	U	ug/l		7.3	U	ug/l		9	U	ug/l	40	7.3	U	ug/l	
Potassium	1310	J	ug/l		1220	J	ug/l		614	U	ug/l	5000	316	U	ug/l	
Selenium	.6	U	ug/l		.6	U	ug/l		2	U	ug/l	5	.61	J	ug/l	
Silver	2.5	U	ug/l		2.5	U	ug/l		2.7	U	ug/l	10	2.5	U	ug/l	
Sodium	2460	J	ug/l		2500	J	ug/l		1880	J	ug/l	5000	2100	J	ug/l	
Thallium	.6	U	ug/l		.6	U	ug/l		.88	U	ug/l	10	.6	U	ug/l	
Vanadium	1.7	U	ug/l		1.8	U	ug/l		2.5	U	ug/l	50	1.2	U	ug/l	
Zinc	223		ug/l		233		ug/l		16.9	J	ug/l	20	2.4	U	ug/l	
Cyanide	2.8	J	ug/l		-		ug/l		1.7	U	ug/l	10	1.8	U	ug/l	

Naval Air Station Whiting Field, Milton, Florida
Site 13 Ground Water Data

Lab Sample Number:		MD985002			MD985002			MD985003			MD985002		
Site		WHITING			WHITING			WHITING			WHITING		
Locator		13G00301			13G00301			13G00301F			13G00401		
Collect Date:		16-JUN-97			16-JUN-97			16-JUN-97			16-JUN-97		
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	
CLP VOLATILES 90-SOW	ug/l												
Chloromethane		10	U	ug/l	10	-	ug/l		-		ug/l		
Bromomethane		10	U	ug/l	10	-	ug/l		-		ug/l		
Vinyl chloride		10	U	ug/l	10	-	ug/l		-		ug/l		
Chloroethane		10	U	ug/l	10	-	ug/l		-		ug/l		
Methylene chloride		10	U	ug/l	10	-	ug/l		-		ug/l		
Acetone		10	U	ug/l	10	-	ug/l		-		ug/l		
Carbon disulfide		10	U	ug/l	10	-	ug/l		-		ug/l		
1,1-Dichloroethene		10	U	ug/l	10	-	ug/l		-		ug/l		
1,1-Dichloroethane		10	U	ug/l	10	-	ug/l		-		ug/l		
1,2-Dichloroethene (total)		10	U	ug/l	10	-	ug/l		-		ug/l		
Chloroform		10	U	ug/l	10	-	ug/l		-		ug/l		
1,2-Dichloroethane		10	U	ug/l	10	-	ug/l		-		ug/l		
2-Butanone		10	U	ug/l	10	-	ug/l		-		ug/l		
1,1,1-Trichloroethane		10	U	ug/l	10	-	ug/l		-		ug/l		
Carbon tetrachloride		10	U	ug/l	10	-	ug/l		-		ug/l		
Bromodichloromethane		10	U	ug/l	10	-	ug/l		-		ug/l		
1,2-Dichloropropane		10	U	ug/l	10	-	ug/l		-		ug/l		
cis-1,3-Dichloropropene		10	U	ug/l	10	-	ug/l		-		ug/l		
Trichloroethene		10	U	ug/l	10	-	ug/l		-		ug/l		
Dibromochloromethane		10	U	ug/l	10	-	ug/l		-		ug/l		
1,1,2-Trichloroethane		10	U	ug/l	10	-	ug/l		-		ug/l		
Benzene		10	U	ug/l	10	-	ug/l		-		ug/l		
trans-1,3-Dichloropropene		10	U	ug/l	10	-	ug/l		-		ug/l		
Bromoform		10	U	ug/l	10	-	ug/l		-		ug/l		
4-Methyl-2-pentanone		10	U	ug/l	10	-	ug/l		-		ug/l		
2-Hexanone		10	U	ug/l	10	-	ug/l		-		ug/l		
Tetrachloroethene		10	U	ug/l	10	-	ug/l		-		ug/l		
Toluene		10	U	ug/l	10	-	ug/l		-		ug/l		
1,1,2,2-Tetrachloroethane		10	U	ug/l	10	-	ug/l		-		ug/l		
Chlorobenzene		10	U	ug/l	10	-	ug/l		-		ug/l		
Ethylbenzene		10	U	ug/l	10	-	ug/l		-		ug/l		
Styrene		10	U	ug/l	10	-	ug/l		-		ug/l		
Xylenes (total)									-		ug/l		
CLP SEMIVOLATILES 90-SOW	ug/l												
Phenol		10	U	ug/l	10	-	ug/l		-		ug/l	10	U
bis(2-Chloroethyl) ether		10	U	ug/l	10	-	ug/l		-		ug/l	10	U
2-Chlorophenol		10	U	ug/l	10	-	ug/l		-		ug/l	10	U
1,3-Dichlorobenzene		10	U	ug/l	10	-	ug/l		-		ug/l	10	U
1,4-Dichlorobenzene		10	U	ug/l	10	-	ug/l		-		ug/l	10	U

Naval Air Station Whiting Field, Milton, Florida
Site 13 Groundwater Data

Lab Sample Number:	MD985002				MD985002				MD985003				MD985002			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	13G00301				13G00301				13G00301F				13G00401			
Collect Date:	16-JUN-97				16-JUN-97				16-JUN-97				16-JUN-97			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
1,2-Dichlorobenzene	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
2-Methylphenol	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
2,2-oxybis(1-Chloropropane)	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
4-Methylphenol	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
N-Nitroso-di-n-propylamine	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
Hexachloroethane	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
Nitrobenzene	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
Isophorone	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
2-Nitrophenol	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
2,4-Dimethylphenol	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
bis(2-Chloroethoxy) methane	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
2,4-Dichlorophenol	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
1,2,4-Trichlorobenzene	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
Naphthalene	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
4-Chloroaniline	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
Hexachlorobutadiene	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
4-Chloro-3-methylphenol	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
2-Methylnaphthalene	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
Hexachlorocyclopentadiene	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
2,4,6-Trichlorophenol	10	U	ug/l	10	-		ug/l		-		ug/l		25	U	ug/l	25
2,4,5-Trichlorophenol	25	U	ug/l	25	-		ug/l		-		ug/l		10	U	ug/l	10
2-Chloronaphthalene	10	U	ug/l	10	-		ug/l		-		ug/l		25	U	ug/l	25
2-Nitroaniline	25	U	ug/l	25	-		ug/l		-		ug/l		10	U	ug/l	10
Dimethylphthalate	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
Acenaphthylene	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
2,6-Dinitrotoluene	10	U	ug/l	10	-		ug/l		-		ug/l		25	U	ug/l	25
3-Nitroaniline	25	U	ug/l	25	-		ug/l		-		ug/l		10	U	ug/l	10
Acenaphthene	10	U	ug/l	10	-		ug/l		-		ug/l		25	U	ug/l	25
2,4-Dinitrophenol	25	U	ug/l	25	-		ug/l		-		ug/l		25	U	ug/l	25
4-Nitrophenol	25	U	ug/l	25	-		ug/l		-		ug/l		10	U	ug/l	10
Dibenzofuran	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
2,4-Dinitrotoluene	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
Diethylphthalate	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
4-Chlorophenyl-phenylether	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
Fluorene	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
4-Nitroaniline	25	U	ug/l	25	-		ug/l		-		ug/l		25	U	ug/l	25
4,6-Dinitro-2-methylphenol	25	U	ug/l	25	-		ug/l		-		ug/l		25	U	ug/l	25
N-Nitrosodiphenylamine	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
4-Bromophenyl-phenylether	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
Hexachlorobenzene	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
Pentachlorophenol	25	U	ug/l	25	-		ug/l		-		ug/l		25	U	ug/l	25
Phenanthrene	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
Anthracene	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
Carbazole	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
Di-n-butylphthalate	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
Fluoranthene	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
Pyrene	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
Butylbenzylphthalate	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
3,3-Dichlorobenzidine	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
Benzo (a) anthracene	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
Chrysene	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10
bis(2-Ethylhexyl) phthalate	10	U	ug/l	10	-		ug/l		-		ug/l		10	U	ug/l	10

Naval Air Station Whiting Field, Milton, Florida
Site 13 Groundwater Data

Lab Sample Number:		MD985002			MD985002			MD985003			MD985002		
Site		WHITING			WHITING			WHITING			WHITING		
Locator		13G00301			13G00301			13G00301F			13G00401		
Collect Date:		16-JUN-97			16-JUN-97			16-JUN-97			16-JUN-97		
		VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL
Di-n-octylphthalate		10 U	ug/l	10	-	ug/l		-	ug/l		10 U	ug/l	10
Benzo (b) fluoranthene		10 U	ug/l	10	-	ug/l		-	ug/l		10 U	ug/l	10
Benzo (k) fluoranthene		10 U	ug/l	10	-	ug/l		-	ug/l		10 U	ug/l	10
Benzo (a) pyrene		10 U	ug/l	10	-	ug/l		-	ug/l		10 U	ug/l	10
Indeno (1,2,3-cd) pyrene		10 U	ug/l	10	-	ug/l		-	ug/l		10 U	ug/l	10
Dibenzo (a,h) anthracene		10 U	ug/l	10	-	ug/l		-	ug/l		10 U	ug/l	10
Benzo (g,h,i) perylene		10 U	ug/l	10	-	ug/l		-	ug/l		10 U	ug/l	10
CLP PESTICIDES/PCBS 90-SOW	ug/l												
alpha-BHC		-	ug/l		.05 U	ug/l	.05	-	ug/l		-	ug/l	
beta-BHC		-	ug/l		.05 U	ug/l	.05	-	ug/l		-	ug/l	
delta-BHC		-	ug/l		.05 UJ	ug/l	.05	-	ug/l		-	ug/l	
gamma-BHC (Lindane)		-	ug/l		.05 U	ug/l	.05	-	ug/l		-	ug/l	
Heptachlor		-	ug/l		.05 U	ug/l	.05	-	ug/l		-	ug/l	
Aldrin		-	ug/l		.05 U	ug/l	.05	-	ug/l		-	ug/l	
Heptachlor epoxide		-	ug/l		.05 U	ug/l	.05	-	ug/l		-	ug/l	
Endosulfan I		-	ug/l		.05 U	ug/l	.05	-	ug/l		-	ug/l	
Dieldrin		-	ug/l		.1 U	ug/l	.1	-	ug/l		-	ug/l	
4,4-DDE		-	ug/l		.1 U	ug/l	.1	-	ug/l		-	ug/l	
Endrin		-	ug/l		.1 U	ug/l	.1	-	ug/l		-	ug/l	
Endosulfan II		-	ug/l		.1 U	ug/l	.1	-	ug/l		-	ug/l	
4,4-DDD		-	ug/l		.1 U	ug/l	.1	-	ug/l		-	ug/l	
Endosulfan sulfate		-	ug/l		.1 U	ug/l	.1	-	ug/l		-	ug/l	
4,4-DDT		-	ug/l		.1 U	ug/l	.1	-	ug/l		-	ug/l	
Methoxychlor		-	ug/l		.5 UJ	ug/l	.5	-	ug/l		-	ug/l	
Endrin ketone		-	ug/l		.1 U	ug/l	.1	-	ug/l		-	ug/l	
Endrin aldehyde		-	ug/l		.1 U	ug/l	.1	-	ug/l		-	ug/l	
alpha-Chlordane		-	ug/l		.05 U	ug/l	.05	-	ug/l		-	ug/l	
gamma-Chlordane		-	ug/l		.05 U	ug/l	.05	-	ug/l		-	ug/l	
Toxaphene		-	ug/l		5 U	ug/l	5	-	ug/l		-	ug/l	
Aroclor-1016		-	ug/l		1 U	ug/l	1	-	ug/l		-	ug/l	
Aroclor-1221		-	ug/l		2 U	ug/l	2	-	ug/l		-	ug/l	
Aroclor-1232		-	ug/l		1 U	ug/l	1	-	ug/l		-	ug/l	
Aroclor-1242		-	ug/l		1 U	ug/l	1	-	ug/l		-	ug/l	
Aroclor-1248		-	ug/l		1 U	ug/l	1	-	ug/l		-	ug/l	
Aroclor-1254		-	ug/l		1 U	ug/l	1	-	ug/l		-	ug/l	
Aroclor-1260		-	ug/l		1 U	ug/l	1	-	ug/l		-	ug/l	
CLP METALS AND CYANIDE	ug/l												
Aluminum		409 J	ug/l	200	-	ug/l		382 J	ug/l	200	-	ug/l	
Antimony		60 U	ug/l	60	-	ug/l		60 U	ug/l	60	-	ug/l	
Arsenic		10 U	ug/l	10	-	ug/l		10 U	ug/l	10	-	ug/l	
Barium		163	ug/l	200	-	ug/l		162	ug/l	200	-	ug/l	
Beryllium		5 U	ug/l	5	-	ug/l		5 U	ug/l	5	-	ug/l	
Cadmium		5 U	ug/l	5	-	ug/l		5 U	ug/l	5	-	ug/l	
Calcium		2410	ug/l	5000	-	ug/l		2460	ug/l	5000	-	ug/l	
Chromium		10 U	ug/l	10	-	ug/l		10 U	ug/l	10	-	ug/l	
Cobalt		50 U	ug/l	50	-	ug/l		50 U	ug/l	50	-	ug/l	
Copper		25 U	ug/l	25	-	ug/l		25 U	ug/l	25	-	ug/l	
Iron		424 J	ug/l	100	-	ug/l		407 J	ug/l	100	-	ug/l	
Lead		3 U	ug/l	3	-	ug/l		3 U	ug/l	3	-	ug/l	
Magnesium		3570	ug/l	5000	-	ug/l		3550	ug/l	5000	-	ug/l	

Naval Air Station Whiting Field, Milton, Florida
Site 13 Groundwater Data

Lab Sample Number:	MD985002				MD985002				MD985003				MD985002			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	13G00301				13G00301				13G00301F				13G00401			
Collect Date:	16-JUN-97				16-JUN-97				16-JUN-97				16-JUN-97			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Manganese	11.1	J	ug/l	15	-		ug/l		11.1	J	ug/l	15	-		ug/l	
Mercury	.2	U	ug/l	.2	-		ug/l		.2	U	ug/l	.2	-		ug/l	
Nickel	40	U	ug/l	40	-		ug/l		40	U	ug/l	40	-		ug/l	
Potassium	5000	U	ug/l	5000	-		ug/l		5000	U	ug/l	5000	-		ug/l	
Selenium	5	U	ug/l	5	-		ug/l		5	UJ	ug/l	5	-		ug/l	
Silver	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Sodium	1780	J	ug/l	5000	-		ug/l		1800	J	ug/l	5000	-		ug/l	
Thallium	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Vanadium	50	U	ug/l	50	-		ug/l		50	U	ug/l	50	-		ug/l	
Zinc	20	U	ug/l	20	-		ug/l		20	U	ug/l	20	-		ug/l	
Cyanide	10	U	ug/l	10	-		ug/l		10		ug/l	10	-		ug/l	

Naval Air Station Whiting Field, Milton, Florida
Site 13 Groundwater Data

Lab Sample Number:		MD985004			MD985004			MF004006		
Site		WHITING			WHITING			WHITING		
Locator		13G00401			13G00401			13G00401		
Collect Date:		16-JUN-97			16-JUN-97			28-OCT-97		
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW	ug/l										
Chloromethane		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
Bromomethane		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
Vinyl chloride		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
Chloroethane		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
Methylene chloride		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
Acetone		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
Carbon disulfide		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
1,1-Dichloroethene		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
1,1-Dichloroethane		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
1,2-Dichloroethene (total)		3	J	ug/l	10	-	ug/l	2	J	ug/l	10
Chloroform		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
1,2-Dichloroethane		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
2-Butanone		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
1,1,1-Trichloroethane		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
Carbon tetrachloride		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
Bromodichloromethane		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
1,2-Dichloropropane		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
cis-1,3-Dichloropropene		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
Trichloroethene		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
Dibromochloromethane		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
1,1,2-Trichloroethane		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
Benzene		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
trans-1,3-Dichloropropene		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
Bromoform		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
4-Methyl-2-pentanone		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
2-Hexanone		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
Tetrachloroethene		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
Toluene		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
1,1,2,2-Tetrachloroethane		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
Chlorobenzene		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
Ethylbenzene		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
Styrene		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
Xylenes (total)		10	U	ug/l	10	-	ug/l	10	U	ug/l	10
CLP SEMIVOLATILES 90-SOW	ug/l										
Phenol		-		ug/l		-	ug/l	-		ug/l	
bis(2-Chloroethyl) ether		-		ug/l		-	ug/l	-		ug/l	
2-Chlorophenol		-		ug/l		-	ug/l	-		ug/l	
1,3-Dichlorobenzene		-		ug/l		-	ug/l	-		ug/l	
1,4-Dichlorobenzene		-		ug/l		-	ug/l	-		ug/l	

Naval Air Station Whiting Field, Milton, Florida
Site 13 Groundwater Data

Lab Sample Number:	MD985004			MD985004			MF004006		
Site	WHITING			WHITING			WHITING		
Locator	13G00401			13G00401			13G00401		
Collect Date:	16-JUN-97			16-JUN-97			28-OCT-97		
	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL
1,2-Dichlorobenzene	-	ug/l		-	ug/l		-	ug/l	
2-Methylphenol	-	ug/l		-	ug/l		-	ug/l	
2,2-oxybis(1-Chloropropane)	-	ug/l		-	ug/l		-	ug/l	
4-Methylphenol	-	ug/l		-	ug/l		-	ug/l	
N-Nitroso-di-n-propylamine	-	ug/l		-	ug/l		-	ug/l	
Hexachloroethane	-	ug/l		-	ug/l		-	ug/l	
Nitrobenzene	-	ug/l		-	ug/l		-	ug/l	
Isophorone	-	ug/l		-	ug/l		-	ug/l	
2-Nitrophenol	-	ug/l		-	ug/l		-	ug/l	
2,4-Dimethylphenol	-	ug/l		-	ug/l		-	ug/l	
bis(2-Chloroethoxy) methane	-	ug/l		-	ug/l		-	ug/l	
2,4-Dichlorophenol	-	ug/l		-	ug/l		-	ug/l	
1,2,4-Trichlorobenzene	-	ug/l		-	ug/l		-	ug/l	
Naphthalene	-	ug/l		-	ug/l		-	ug/l	
4-Chloroaniline	-	ug/l		-	ug/l		-	ug/l	
Hexachlorobutadiene	-	ug/l		-	ug/l		-	ug/l	
4-Chloro-3-methylphenol	-	ug/l		-	ug/l		-	ug/l	
2-Methylnaphthalene	-	ug/l		-	ug/l		-	ug/l	
Hexachlorocyclopentadiene	-	ug/l		-	ug/l		-	ug/l	
2,4,6-Trichlorophenol	-	ug/l		-	ug/l		-	ug/l	
2,4,5-Trichlorophenol	-	ug/l		-	ug/l		-	ug/l	
2-Chloronaphthalene	-	ug/l		-	ug/l		-	ug/l	
2-Nitroaniline	-	ug/l		-	ug/l		-	ug/l	
Dimethylphthalate	-	ug/l		-	ug/l		-	ug/l	
Acenaphthylene	-	ug/l		-	ug/l		-	ug/l	
2,6-Dinitrotoluene	-	ug/l		-	ug/l		-	ug/l	
3-Nitroaniline	-	ug/l		-	ug/l		-	ug/l	
Acenaphthene	-	ug/l		-	ug/l		-	ug/l	
2,4-Dinitrophenol	-	ug/l		-	ug/l		-	ug/l	
4-Nitrophenol	-	ug/l		-	ug/l		-	ug/l	
Dibenzofuran	-	ug/l		-	ug/l		-	ug/l	
2,4-Dinitrotoluene	-	ug/l		-	ug/l		-	ug/l	
Diethylphthalate	-	ug/l		-	ug/l		-	ug/l	
4-Chlorophenyl-phenylether	-	ug/l		-	ug/l		-	ug/l	
Fluorene	-	ug/l		-	ug/l		-	ug/l	
4-Nitroaniline	-	ug/l		-	ug/l		-	ug/l	
4,6-Dinitro-2-methylphenol	-	ug/l		-	ug/l		-	ug/l	
N-Nitrosodiphenylamine	-	ug/l		-	ug/l		-	ug/l	
4-Bromophenyl-phenylether	-	ug/l		-	ug/l		-	ug/l	
Hexachlorobenzene	-	ug/l		-	ug/l		-	ug/l	
Pentachlorophenol	-	ug/l		-	ug/l		-	ug/l	
Phenanthrene	-	ug/l		-	ug/l		-	ug/l	
Anthracene	-	ug/l		-	ug/l		-	ug/l	
Carbazole	-	ug/l		-	ug/l		-	ug/l	
Di-n-butylphthalate	-	ug/l		-	ug/l		-	ug/l	
Fluoranthene	-	ug/l		-	ug/l		-	ug/l	
Pyrene	-	ug/l		-	ug/l		-	ug/l	
Butylbenzylphthalate	-	ug/l		-	ug/l		-	ug/l	
3,3-Dichlorobenzidine	-	ug/l		-	ug/l		-	ug/l	
Benzo (a) anthracene	-	ug/l		-	ug/l		-	ug/l	
Chrysene	-	ug/l		-	ug/l		-	ug/l	
bis(2-Ethylhexyl) phthalate	-	ug/l		-	ug/l		-	ug/l	

Naval Air Station Whiting Field, Milton, Florida
Site 13 Groundwater Data

Lab Sample Number:		MD985004			MD985004			MF004006		
Site		WHITING			WHITING			WHITING		
Locator		13G00401			13G00401			13G00401		
Collect Date:		16-JUN-97			16-JUN-97			28-OCT-97		
		VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL
Di-n-octylphthalate		-	ug/l		-	ug/l		-	ug/l	
Benzo (b) fluoranthene		-	ug/l		-	ug/l		-	ug/l	
Benzo (k) fluoranthene		-	ug/l		-	ug/l		-	ug/l	
Benzo (a) pyrene		-	ug/l		-	ug/l		-	ug/l	
Indeno (1,2,3-cd) pyrene		-	ug/l		-	ug/l		-	ug/l	
Dibenzo (a,h) anthracene		-	ug/l		-	ug/l		-	ug/l	
Benzo (g,h,i) perylene		-	ug/l		-	ug/l		-	ug/l	
CLP PESTICIDES/PCBS 90-SOW	ug/l									
alpha-BHC		-	ug/l		.05 U	ug/l	.05	-	ug/l	
beta-BHC		-	ug/l		.05 U	ug/l	.05	-	ug/l	
delta-BHC		-	ug/l		.05 UJ	ug/l	.05	-	ug/l	
gamma-BHC (Lindane)		-	ug/l		.05 U	ug/l	.05	-	ug/l	
Heptachlor		-	ug/l		.05 U	ug/l	.05	-	ug/l	
Aldrin		-	ug/l		.05 U	ug/l	.05	-	ug/l	
Heptachlor epoxide		-	ug/l		.05 U	ug/l	.05	-	ug/l	
Endosulfan I		-	ug/l		.05 U	ug/l	.05	-	ug/l	
Dieldrin		-	ug/l		.1 U	ug/l	.1	-	ug/l	
4,4-DDE		-	ug/l		.1 U	ug/l	.1	-	ug/l	
Endrin		-	ug/l		.1 U	ug/l	.1	-	ug/l	
Endosulfan II		-	ug/l		.1 U	ug/l	.1	-	ug/l	
4,4-DDD		-	ug/l		.1 U	ug/l	.1	-	ug/l	
Endosulfan sulfate		-	ug/l		.1 U	ug/l	.1	-	ug/l	
4,4-DDT		-	ug/l		.1 U	ug/l	.1	-	ug/l	
Methoxychlor		-	ug/l		.5 UJ	ug/l	.5	-	ug/l	
Endrin ketone		-	ug/l		.1 U	ug/l	.1	-	ug/l	
Endrin aldehyde		-	ug/l		.1 U	ug/l	.1	-	ug/l	
alpha-Chlordane		-	ug/l		.05 U	ug/l	.05	-	ug/l	
gamma-Chlordane		-	ug/l		.05 U	ug/l	.05	-	ug/l	
Toxaphene		-	ug/l		5 U	ug/l	5	-	ug/l	
Aroclor-1016		-	ug/l		1 U	ug/l	1	-	ug/l	
Aroclor-1221		-	ug/l		2 U	ug/l	2	-	ug/l	
Aroclor-1232		-	ug/l		1 U	ug/l	1	-	ug/l	
Aroclor-1242		-	ug/l		1 U	ug/l	1	-	ug/l	
Aroclor-1248		-	ug/l		1 U	ug/l	1	-	ug/l	
Aroclor-1254		-	ug/l		1 U	ug/l	1	-	ug/l	
Aroclor-1260		-	ug/l		1 U	ug/l	1	-	ug/l	
CLP METALS AND CYANIDE	ug/l									
Aluminum		37.9 J	ug/l	200	-	ug/l		-	ug/l	
Antimony		60 U	ug/l	60	-	ug/l		-	ug/l	
Arsenic		10 U	ug/l	10	-	ug/l		-	ug/l	
Barium		69.6	ug/l	200	-	ug/l		-	ug/l	
Beryllium		5 U	ug/l	5	-	ug/l		-	ug/l	
Cadmium		5 U	ug/l	5	-	ug/l		-	ug/l	
Calcium		2550	ug/l	5000	-	ug/l		-	ug/l	
Chromium		10 U	ug/l	10	-	ug/l		-	ug/l	
Cobalt		50 U	ug/l	50	-	ug/l		-	ug/l	
Copper		25 U	ug/l	25	-	ug/l		-	ug/l	
Iron		146 J	ug/l	100	-	ug/l		-	ug/l	
Lead		3 U	ug/l	3	-	ug/l		-	ug/l	
Magnesium		2020	ug/l	5000	-	ug/l		-	ug/l	

Naval Air Station Whiting Field, Milton, Florida
Site 13 Groundwater Data

Lab Sample Number:	MD985004				MD985004				MF004006		
Site	WHITING				WHITING				WHITING		
Locator	13G00401				13G00401				13G00401		
Collect Date:	16-JUN-97				16-JUN-97				28-OCT-97		
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Manganese	16.4	J	ug/l	15	-		ug/l		-		ug/l	
Mercury	.2	U	ug/l	.2	-		ug/l		-		ug/l	
Nickel	40	U	ug/l	40	-		ug/l		-		ug/l	
Potassium	5000	U	ug/l	5000	-		ug/l		-		ug/l	
Selenium	5	U	ug/l	5	-		ug/l		-		ug/l	
Silver	10	U	ug/l	10	-		ug/l		-		ug/l	
Sodium	2030	J	ug/l	5000	-		ug/l		-		ug/l	
Thallium	10	U	ug/l	10	-		ug/l		-		ug/l	
Vanadium	50	U	ug/l	50	-		ug/l		-		ug/l	
Zinc	20	U	ug/l	20	-		ug/l		-		ug/l	
Cyanide	10	U	ug/l	10	-		ug/l		-		ug/l	

Naval Air Station Whiting Field, Milton, Florida
Site 13 Groundwater Data

Lab Sample Number:		RC093001				RC093002				RC093004				RC093003		
Site		WHITING				WHITING				WHITING				WHITING		
Locator		13G00101				13G00102				13G00103				13G00201		
Collect Date:		09-SEP-96				09-SEP-96				10-SEP-96				10-SEP-96		
		VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Groundwater Quality	mg/l																
Alkalinity as CaCO3		64		mg/l	10	93		mg/l	10	41		mg/l	10	10	U	mg/l	10
Ammonia-N		.3	U	mg/l	.3	.3	U	mg/l	.3	.3	U	mg/l	.3	.3	U	mg/l	.3
Chloride		11		mg/l	10	10	U	mg/l	10	10	U	mg/l	10	10	U	mg/l	10
Hardness as CaCO3		46		mg/l	10	156		mg/l	10	92		mg/l	10	10	U	mg/l	10
Nitrate-Nitrite		.1	U	mg/l	.1	.1	U	mg/l	.1	.18		mg/l	.1	.1	U	mg/l	.1
Phosphorous-P, Total		.1	U	mg/l	.1	.1	U	mg/l	.1	.1	U	mg/l	.1	.1	U	mg/l	.1
Sulfate		9.83		mg/l	.1	69.2		mg/l	1	40.7		mg/l	1	4.96		mg/l	.1
Sulfide		2	U	mg/l	2	2	U	mg/l	2	2	U	mg/l	2	2	U	mg/l	2
Total Dissolved Solids		102		mg/l	10	208		mg/l	10	112		mg/l	10	24		mg/l	10
Total Kjeldahl Nitrogen		.3	U	mg/l	.3	.3	U	mg/l	.3	.3	U	mg/l	.3	.3	U	mg/l	.3
Total organic carbon		2.7		mg/l	1	1.3		mg/l	1	1.7		mg/l	1	1	U	mg/l	1
Total petroleum hydrocarbons		-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Dissolved Methane		-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Dissolved Organic Carbon		-		mg/l		-		mg/l		-		mg/l		-		mg/l	

Naval Air Station Whiting Field, Milton, Florida
Site 13 Groundwater Data

Lab Sample Number:		MD984001				MD984002		
Site		WHITING				WHITING		
Locator		13G00301				13G00401		
Collect Date:		16-JUN-97				16-JUN-97		
		VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Groundwater Quality	mg/l								
Alkalinity as CaCO3		3	U	mg/l	3	3	U	mg/l	3
Ammonia-N		-		mg/l		-		mg/l	
Chloride		7.6		mg/l	1	5.1		mg/l	1
Hardness as CaCO3		-		mg/l		-		mg/l	
Nitrate-Nitrite		3.75		mg/l	.1	2.39		mg/l	.1
Phosphorous-P, Total		-		mg/l		-		mg/l	
Sulfate		2	U	mg/l	2	2	U	mg/l	2
Sulfide		.1	U	mg/l	.1	.1	U	mg/l	.1
Total Dissolved Solids		58		mg/l	10	50		mg/l	10
Total Kjeldahl Nitrogen		.1	U	mg/l	.1	.1	U	mg/l	.1
Total organic carbon		2.3		mg/l	1	1	U	mg/l	1
Total petroleum hydrocarbons		-		mg/l		-		mg/l	
Dissolved Methane		-		mg/l		-		mg/l	
Dissolved Organic Carbon		-		mg/l		-		mg/l	

APPENDIX E

QUALITY ASSURANCE AND QUALITY CONTROL DATA

LABORATORY DATA CONSULTANTS, INC.
7750 El Camino Real, Suite 2C, Carlsbad, CA 92009 Phone: 619 634-0437 Fax: 619 634-0439

APPENDIX A

Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida
PARCC Summary Tables

Draft Version

08/30/96

APPENDIX A

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Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton, Florida

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Tab

SDG#: WF016 | **VALIDATION SAMPLE TABLE** | **L[illegible]#:** 1876A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide
BKB00101	RB583001		soil	5-20-96	X	X	X	X	X
BKB00102	RB583002		soil	5-20-96	X	X	X	X	X
BKB00401	RB583003	FD	soil	5-20-96	X	X	X	X	X
BKB00401D	RB583004	FD	soil	5-20-96	X	X	X	X	X
BKB00402	RB583005		soil	5-20-96	X	X	X	X	X
BKB00201	RB583006		soil	5-20-96	X	X	X	X	X
BKB00202	RB583007		soil	5-20-96	X	X	X	X	X
BKR00201	RB583008	R	water	5-20-96	X	X	X	X	X
BKF00101	RB583009	SB	water	5-20-96	X	X	X	X	X
BKT00201	RB583010	TB	water	5-20-96	X				
BKB00301	RB583011		soil	5-21-96	X	X	X	X	X
BKB00302	RB583012		soil	5-21-96	X	X	X	X	X
BKB00501	RB583013		soil	5-21-96	X	X	X	X	X
BKB00502	RB583014		soil	5-21-96	X	X	X	X	X
BKB00601	RB583015		soil	5-21-96	X	X	X	X	X
BKB00602	RB583016	FD	soil	5-21-96	X	X	X	X	X
BKB00602D	RB583017	FD	soil	5-21-96	X	X	X	X	X
BKB00701	RB583018		soil	5-21-96	X	X	X	X	X
BKB00702	RB583019		soil	5-21-96	X	X	X	X	X
BKB00401MS	RB583003MS	MS	soil	5-20-96	X	X	X	X	X
BKB00401MSD	RB583003MSD	MSD	soil	5-20-96	X	X	X	X	X
BKR00201MS	RB583008MS	MS	water	5-20-96				X	
BKR00201MSD	RB583008MSD	MSD	water	5-20-96				X	

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF016 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1876A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide
BKF00101MS	RB583009MS	MS	water	5-20-96					X
BKF00101MSD	RB583009MSD	MSD	water	5-20-96					X

T rip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Tab

SDG#: WF017 **VALIDATION SAMPLE TABLE** **L[illegible]#:** 1876B

Project Name: NAS Whiting Field Parameters/Analytical Method **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide
31B00601	RB592001	FD	soil	5-21-96	X	X	X	X	X
31B00602	RB592002		soil	5-21-96	X	X	X	X	X
31B00603	RB592003		soil	5-21-96	X	X	X	X	X
31B00604	RB592004		soil	5-21-96	X	X	X	X	X
31B00605	RB592005		soil	5-21-96	X	X	X	X	X
31B00601D	RB592006	FD	soil	5-21-96	X	X	X	X	X
12B00101	RB592007	FD	soil	5-21-96	X	X	X	X	X
12B00101D	RB592008	FD	soil	5-21-96	X	X	X	X	X
12B00102	RB592009		soil	5-21-96	X	X	X	X	X
31B00701	RB592010		soil	5-22-96	X	X	X	X	X
31B00702	RB592011		soil	5-22-96	X	X	X	X	X
31B00703	RB592012		soil	5-22-96	X	X	X	X	X
31B00704	RB592013		soil	5-22-96	X	X	X	X	X
31B00705	RB592014		soil	5-22-96	X	X	X	X	X
31B00801	RB592015		soil	5-22-96	X	X	X	X	X
31B00801DL	RB592015DL		soil	5-22-96	X				
31B00802	RB592016		soil	5-22-96	X	X	X	X	X
31B00803	RB592017		soil	5-22-96	X	X	X	X	X
31B00803DL	RB592017DL		soil	5-22-96	X				
31B00804	RB592018		soil	5-22-96	X	X	X	X	X
31B00804DL	RB592018DL		soil	5-22-96	X				
31B00805	RB592019		soil	5-22-96	X	X	X	X	X
31R00101	RB592020	R	water	5-22-96	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF017 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1876B

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide
31T00301	RB592021	TB	water	5-22-96	X				
12R00101	RB592022	R	water	5-21-96	X	X	X	X	X
BKT00301	RB592023	TB	water	5-21-96	X				
31B00601MS	RB592001MS	MS	soil	5-21-96	X	X	X	X	X
31B00601MSD	RB592001MSD	MSD	soil	5-21-96	X	X	X	X	X

TP = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Tat

SDG#: WF018 **VALIDATION SAMPLE TABLE** **LL #:** 1876C

Project Name: NAS Whiting Field Parameters/Analytical Method **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Lead only
30B00201	RB602001		soil	5-23-96	X	X	X
30B00202	RB602002	FD	soil	5-23-96	X	X	X
30B00203	RB602003		soil	5-23-96	X	X	X
30B00202D	RB602005	FD	soil	5-23-96	X	X	X
30B00101	RB602006		soil	5-23-96	X	X	X
30B00102	RB602007		soil	5-23-96	X	X	X
30B00103	RB602008		soil	5-23-96	X	X	X
30R00101	RB602010	R	water	5-23-96	X	X	X
30T00101	RB602011	TB	water	5-23-96	X		
30B00202MS	RB602002MS	MS	soil	5-23-96	X	X	X
30B00202MSD	RB602002MSD	MSD	soil	5-23-96	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF019 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1876D

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Lead only
30B00501	MB047001		soil	6-4-96	X	X	X
30B00502	MB047002	FD	soil	6-4-96	X	X	X
30B00503	MB047003		soil	6-4-96	X	X	X
30B00502D	MB047005	FD	soil	6-4-96	X	X	X
30B00401	MB047006		soil	6-4-96	X	X	X
30B00402	MB047007		soil	6-4-96	X	X	X
30B00403	MB047008		soil	6-4-96	X	X	X
30R00201	MB047010	R	water	6-4-96	X	X	X
30T00201	MB047011	TB	water	6-4-96	X		
30R00301	MB068001	R	water	6-5-96	X	X	X
30T00301	MB068002	TB	water	6-5-96	X		
30F00101	MB068003	SB	water	6-5-96	X	X	X
30B00601	MB068004		water	6-5-96	X	X	X
30B00602	MB068005	FD	soil	6-5-96	X	X	X
30B00603	MB068006		soil	6-5-96	X	X	X
30B00602D	MB068009	FD	soil	6-5-96	X	X	X
30B00301	MB068010		soil	6-5-96	X	X	X
30B00302	MB068011		soil	6-5-96	X	X	X
30B00303	MB068012		soil	6-5-96	X	X	X
30B00303DL	MB068012DL		soil	6-5-96		X	
30B00305	MB068015		soil	6-5-96	X	X	X
30B00502MS	MB047002MS	MS	soil	6-4-96	X	X	X
30B00502MSD	MB047002MSD	MSD	soil	6-4-96	X	X	X

Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Tal

SDG#: WF019 **VALIDATION SAMPLE TABLE** **L #:** 1876D

Project Name: NAS Whiting Field Parameters/Analytical Method **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Lead only
30F00101MS	MB068003MS	MS	soil	6-4-96			X
30F00101MSD	MB068003MSD	MSD	soil	6-4-96			X
30B00601MS	MB068004MS	MS	water	6-5-96			X
30B00601MSD	MB068004MSD	MSD	water	6-5-96			X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF020 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1883A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Lead only
33B00301	MB080001		soil	6-6-96	X	X	X
33B00302	MB080002	FD	soil	6-6-96	X	X	X
33B00303	MB080003		soil	6-6-96	X	X	X
33B00304	MB080004		soil	6-6-96	X	X	X
33B00305	MB080005		soil	6-6-96	X	X	X
33B00305RE	MB080005RE		soil	6-6-96		X	
33B00306	MB080006		soil	6-6-96			X
33B00302D	MB080007	FD	soil	6-6-96	X	X	X
33B00201	MB080008		soil	6-6-96	X	X	X
33B00202	MB080009		soil	6-6-96	X	X	X
33B00203	MB080010		soil	6-6-96	X	X	X
33B00205	MB080011		soil	6-6-96			X
33B00101	MB080012		soil	6-6-96	X	X	X
33B00102	MB080013	FD	soil	6-6-96	X	X	X
33B00103	MB080014		soil	6-6-96	X	X	X
33B00102D	MB080015	FD	soil	6-6-96	X	X	X
33R00101	MB080016	R	water	6-6-96	X	X	X
33T00101	MB080017	TB	water	6-6-96	X		
33B00302MS	MB080002MS	MS	soil	6-6-96	X	X	
33B00302MSD	MB080002MSD	MSD	soil	6-6-96	X	X	
33B00302MSRE	MB080002MSRE	MS	soil	6-6-96		X	
33B00302MSDRE	MB080002MSDRE	MSD	soil	6-6-96		X	
33B00302S	MB080002S	MS	soil	6-6-96			X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Tab

SDG#: WF020 | **VALIDATION SAMPLE TABLE** | **L**: 1883A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Lead only
33B00302D	MB080002D	DUP	soil	6-6-96			X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WHF021 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1883B

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	TCLP Metals
30U00101	MB107001		soil	6-11-96	X
30U00201	MB107002		soil	6-11-96	X
30U00301	MB107003		soil	6-11-96	X
30U00401	MB107004		soil	6-11-96	X
33U00101	MB107005		soil	6-11-96	X
33U00201	MB107006		soil	6-11-96	X
33U00301	MB107007		soil	6-11-96	X

T = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table II
Summary of Rejected Data (Organics)
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Fraction	Sample	Compound	Reason
WF016	Volatiles Semivolatiles Pesticides & PCBS	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF017	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF018	Volatiles Semivolatiles	All samples All samples	No rejected results No rejected results	- -
WF019	Volatiles Semivolatiles	All samples All samples	No rejected results No rejected results	- -
WF020	Volatiles Semivolatiles	All samples All samples	No rejected results No rejected results	- -

Table III
Summary of Rejected Data (Inorganics)
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes				
SDG	**Fraction**	**Sample**	**Analyte**	**Reason**
WF016	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF017	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF018	Lead	All samples	No rejected results	-
WF019	Lead	All samples	No rejected results	-

Table IV
Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike/Matrix Spike Duplicates
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Criteria		% Recovery		RPD	Qualifier
			% Recovery	RPD	MS	MSD		
WF016	BKB00401	Volatiles	-	-	-	-	-	None
		Semivolatiles	-	-	-	-	-	None
		Pesticides/PCBs	-	-	-	-	-	None
WF017	31B00601	Volatiles	-	-	-	-	-	None
		N-Nitroso-di-n-propylamine	41-126	≤38	33	-	45	None
		1,2,4-Trichlorobenzene	38-107	≤23	33	-	43	None
		Phenol	-	≤35	-	-	40	None
		1,4-Dichlorobenzene	-	≤27	-	-	44	None
		4-Chloro-3-methylphenol	-	≤33	-	-	38	None
		Acenaphthene	-	≤19	-	-	30	None
		Pesticides/PCBs	-	-	-	-	-	None
WF018	30B00203	Volatiles	-	-	-	-	-	None
		N-Nitroso-di-n-propylamine	41-126	-	33	34	-	UJ
		1,2,4-Trichlorobenzene	38-107	-	35	35	-	UJ
		Pyrene	35-142	-	33	-	-	UJ
WF019	30B00502	Volatiles	-	-	-	-	-	None
		1,4-Dichlorobenzene	-	≤27	-	-	40	UJ
		1,2,4-Trichlorobenzene	-	≤23	-	-	34	UJ
		Acenaphthene	-	≤19	-	-	25	UJ
WF020	33B00302	Volatiles	-	-	-	-	-	None
		Semivolatiles	-	-	-	-	-	None

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF016	**Client ID**	**BKB00401**	**BKB00401D**	
	Laboratory ID	**RB583003**	**RB583004**	
	Collection Date	**5/20/96**	**5/20/96**	
	Acetone	6 ug/Kg	17 ug/Kg	96
	Di-n-butylphthalate	1000 ug/Kg	970 ug/Kg	3
	Pesticides/PBs	ND	ND	-
WF016	**Client ID**	**BKB00602**	**BKB00602D**	
	Laboratory ID	**RB583016**	**RB583017**	
	Collection Date	**5/21/96**	**5/21/96**	
	Acetone	47 ug/Kg	6 ug/Kg	155
	Di-n-butylphthalate	580 ug/Kg	310 ug/Kg	61
	Pesticides/PCBs	ND	ND	-
WF017	**Client ID**	**31B00601**	**31B00601D**	
	Laboratory ID	**RB592001**	**RB592006**	
	Collection Date	**5/21/96**	**5/21/96**	
	Acetone	3 ug/Kg	11 ug/Kg	114
	Di-n-butylphthalate	39 ug/Kg	350U ug/Kg	Not calculable
	Bis(2-ethylhexyl)phthalate	110 ug/Kg	79 ug/Kg	33
	Gamma-chlordane	1.5 ug/Kg	1.1 ug/Kg	31
WF017	**Client ID**	**12B00101**	**12B00101D**	
	Laboratory ID	**RB592007**	**RB592008**	
	Collection Date	**5/21/96**	**5/21/96**	
	Acetone	8 ug/Kg	3 ug/Kg	91
	Diethylphthalate	830 ug/Kg	370U ug/Kg	Not calculable
	Pesticides/PCBs	ND	ND	-
WF018	**Client ID**	**30B00202**	**30B00202D**	
	Laboratory ID	**RB602002**	**RB602005**	
	Collection Date	**5/23/96**	**5/23/96**	
	Acetone	7 ug/Kg	9 ug/Kg	25
	Methylene chloride	1 ug/Kg	2 ug/Kg	67
	Di-n-butylphthalate	380U ug/Kg	360 ug/Kg	Not calculable
WF019	**Client ID**	**30B00502**	**30B00502D**	
	Laboratory ID	**MB047002**	**MB047005**	
	Collection Date	**6/4/96**	**6/4/96**	
	Acetone	16 ug/Kg	14 ug/Kg	13
	Methylene chloride	2 ug/Kg	2 ug/Kg	0
	Trichloroethene	ND	1 ug/Kg	Not calculable
	Bis(2-ethylhexyl)phthalate	1000 ug/Kg	970 ug/Kg	3
	2-Methylnaphthalene	1900U ug/Kg	210 ug/Kg	Not calculable

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF019	**Client ID**	**30B00602**	**30B00602D**	
	Laboratory ID	**MB068005**	**MB068009**	
	Collection Date	**6/5/96**	**6/5/96**	
	Acetone	23 ug/Kg	31 ug/Kg	30
	Methylene chloride	5 ug/Kg	4 ug/Kg	22
	Trichloroethene	ND	1	Not calculable
	Di-n-butylphthalate	51 ug/Kg	43 ug/Kg	17
	Bis(2-ethylhexyl)phthalate	99 ug/Kg	42 ug/Kg	81
WF020	**Client ID**	**33B00302**	**33B00302D**	
	Laboratory ID	**MB080002**	**MB08007**	
	Collection Date	**6/6/96**	**6/6/96**	
	Acetone	7 ug/Kg	8 ug/Kg	13
	Methylene chloride	ND	2 ug/Kg	Not calculable
	1,2-Dichloroethene (total)	ND	4 ug/Kg	Not calculable
	Trichloroethene	ND	13 ug/Kg	Not calculable
	Bis(2-ethylhexyl)phthalate	48 ug/Kg	380U ug/Kg	Not calculable
WF020	**Client ID**	**33B00102**	**33B00102D**	
	Laboratory ID	**MB080013**	**MB080015**	
	Collection Date	**6/6/96**	**6/6/96**	
	Acetone	5 ug/Kg	5 ug/Kg	0
	Methylene chloride	ND	1 ug/Kg	Not calculable
	Di-n-butylphthalate	66 ug/Kg	45 ug/Kg	21
	Bis(2-ethylhexyl)phthalate	760 ug/Kg	370U ug/Kg	Not calculable

Table VI
Summary of Surrogate Recoveries
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF016	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
	All samples	Pesticides/PCBs	All within QC limits	-	-	None
WF017	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			6	
	12R00101	Decachlorobiphenyl	57	60-150		UJ (all detects)
		Decachlorobiphenyl	56	60-150		UJ (all detects)
	31R00101	Decachlorobiphenyl	27	60-150		UJ (all detects)
		Decachlorobiphenyl	27	60-150		UJ (all detects)
	12B00101D	Tetrachloro-m-xylene	58	60-150		UJ (all detects)
	12B00102	Tetrachloro-m-xylene	55	60-150		UJ (all detects)
		Tetrachloro-m-xylene	56	60-150		UJ (all detects)
	31B00603	Tetrachloro-m-xylene	46	60-150		UJ (all detects)
		Decachlorobiphenyl	54	60-150		UJ (all detects)
		Tetrachloro-m-xylene	49	60-150		UJ (all detects)
		Decachlorobiphenyl	53	60-150		UJ (all detects)
	31B00604	Tetrachloro-m-xylene	52	60-150		UJ (all detects)
		Decachlorobiphenyl	58	60-150		UJ (all detects)
		Tetrachloro-m-xylene	54	60-150		UJ (all detects)
WF018	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
WF019	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
WF020	All samples	Volatiles	All within QC limits	-	-	None
	33B00305	Semivolatiles			1	
		2-Fluorophenol	0	25-121		R (all compounds)
		Phenol-d5	0	24-113		R (all compounds)
		2-Chlorophenol-d4	0	20-130		R (all compounds)
		1,2-Dichlorobenzene-d4	0	20-130		R (all compounds)
		Nitrobenzene-d5	0	23-120		R (all compounds)
		2-Fluorobiphenyl	0	30-115		R (all compounds)
		2,4,6-Tribromophenol	0	19-122		R (all compounds)
		Terphenyl-d14	0	18-137		R (all compounds)

Notes: J = estimated value
UJ = undetected, but number that is reported as the quantification limit is an estimated value.

Table VII
Summary of Compounds Exceeding Instrument Calibration
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Criteria		Qualifier
			Initial Calibration %RSD	Continuing Calibration %D	
WF016	5/31/96	Chloromethane	48.8	26.5	UJ
	6/1/96	Chloromethane	42.0	-	UJ
	6/2/96	Chloromethane	-	37.6	UJ
	6/3/96	Chloromethane	-	33.4	UJ
	6/6/96	4-Nitroaniline	-	29.2	UJ
		Di-n-octylphthalate	-	25.2	UJ
	6/12/96	Endrin aldehyde	21.4	-	J
WF017	5/31/96	Chloromethane	48.8	26.5	UJ
	6/1/96	Chloromethane	42.0	-	UJ
	6/2/96	Chloromethane	-	37.6	UJ
	6/3/96	Chloromethane	-	33.4	UJ
	6/4/96	Chloromethane	-	64.3	UJ
		Chloroethane	-	37.9	UJ
	6/4/96	Chloromethane	-	62.2	UJ
	6/6/96	4-Nitroaniline	-	29.2	UJ
		Di-n-octylphthalate	-	25.2	UJ
	6/7/96	Butylbenzylphthalate	-	26.8	UJ
		3,3'-Dichlorobenzidine	-	32.9	UJ
		Bis(2-ethylhexyl)phthalate	-	27.4	UJ
	6/12/96	Endrin aldehyde	21.4	-	J
WF018	5/31/96	Chloromethane	48.8	26.5	UJ
	6/1/96	Chloromethane	42.0	-	UJ
	6/4/96	Chloromethane	-	64.3	UJ
		Chloroethane	-	37.9	UJ
	6/6/96	4-Nitroaniline	-	29.2	UJ
		Di-n-octylphthalate	-	25.2	UJ
WF019	All	Volatiles	-	-	None
	6/11/96	Hexachlorobenzene	-	30.8	UJ

Table VII
Summary of Compounds Exceeding Instrument Calibration
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Criteria		Qualifier
			Initial Calibration %RSD	Continuing Calibration %D	
WF020	All	Volatiles	-	-	None
	6/26/96	Bis(2-ethylhexyl)phthalate	-	28.6	UJ
		Di-n-octylphthalate	-	33.8	UJ

Notes: %RSD = percent Relative Standard Deviation for initial calibrations

%D = percent Difference for continuing calibrations

J = the compound was positively identified; the associated numerical value is the approximate concentration of the compound in the sample, either because its concentration was lower than the QL (laboratory "J" flag), or because QC criteria were not met (validation "J").

UJ = the compound was not detected above the reported sample QL. However, the reported sample QL is approximate; the compound concentration may not reliably be presumed to be less than the QL value.

R = the sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the compound cannot be verified.

Table VIII
Summary of Method Blank Contamination
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Compound	Concentration	Associated Samples
WF016	Acetone	2 ug/Kg	BKB00101 BKB00401 BKB00401D BKB00402 BKB00201 BKB00202 BKB00301 BKB00302 BKB00501 BKB00502 BKB00601 BKB00602
	Acetone	1 ug/Kg	BKB00602D
	Bis(2-ethylhexyl)phthalate	12 ug/L	BKR00201 BKF00101
	Pestcides/PCBs	ND	-
WF017	Acetone	1 ug/Kg	31B00601 31B00605 12B00101 12B00101D 12B00102 31B00702 31B00703 31B00704 31B00705 31B00801 31B00802 31B00803
	Acetone	2 ug/Kg	31B00701 31B00804 31B00805
	Acetone	2 ug/Kg	31B00803DL 31B00804DL
	Bis(2-ethylhexylphthalate	2 ug/L	31R00101
	Bis(2-ethylhexylphthalate	2 ug/L	12R00101
	Pesticides/PCBs	ND	-

Table VIII
Summary of Method Blank Contamination
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Compound	Concentration	Associated Samples
WF018	Acetone	2 ug/Kg	30B00201 30B00203
	Acetone	2 ug/Kg	30B00202 30B00202D 30B00101 30B00102 30B00103
	Bis(2-ethylhexyl)phthalate	43 ug/Kg	30B00201 30B00202 30B00203 30B00202D 30B00101 30B00102 30B00103
WF019	Methylene chloride Acetone	5 ug/Kg 5 ug/Kg	30B00501 30B00502 30B00503 30B00502D 30B00401 30B00402 30B00403
	Acetone	5 ug/Kg	30B00601 30B00602 30B00603 30B00602D 30B00301 30B00302 30B00303 30B00305
	Bis(2-ethylhexyl)phthalate	1 ug/L	30R00201
	Bis(2-ethylhexyl)phthalate	59 ug/Kg	30B00601 30B00602 30B00603 30B00602D 30B00301 30B00302 30B00303 30B00303DL 30B00305

Table VIII
Summary of Method Blank Contamination
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Compound	Concentration	Associated Samples
WF020	Acetone	5 ug/Kg	33B00301 33B00302 33B00303 33B00304 33B00305 33B00302D 33B00201 33B00202 33B00203 33B00101 33B00102 33B00103 33B00102D
	Bis(2-ethylhexyl)phthalate	6 ug/L	33R00101
	Bis(2-ethylhexyl)phthalate	43 ug/Kg	33B00301 33B00302 33B00303 33B00304 33B00302D 33B00201 33B00202 33B00203 33B00101 33B00102 33B00103 33B00102D
	Bis(2-ethylhexylphthalate	300 ug/Kg	33B00305RE

Table IX
Summary of Field Blank Contamination
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF016	**Client ID:** BKR00201 **Laboratory ID:** RB583008 **Collection Date:** 5/20/96 **Type:** Equipment Rinsate		
	Acetone	2 ug/L	None
	Di-n-butylphthalate	8 ug/L	None
	Bis(2-ethylhexyl)phthalate	3 ug/L	10U ug/L[1]
	Pesticides/PCBs	ND	None
WF016	**Client ID:** BKT00201 **Laboratory ID:** RB583010 **Collection Date:** 5/20/96 **Type:** Trip Blank		
	Methylene chloride	1 ug/L	None
	Acetone	13 ug/L	None
WF016	**Client ID:** BKF00101 **Laboratory ID:** RB583009 **Collection Date:** 5/20/96 **Type:** Source Blank		
	Acetone	23 ug/L	None
	Di-n-butylphthalate	9 ug/L	None
	Bis(2-ethylhexyl)phthalate	3 ug/L	10U ug/L[1]
	Pesticides/PCBs	ND	None
WF017	**Client ID:** 12R00101 **Laboratory ID:** RB592022 **Collection Date:** 5/21/96 **Type:** Rinsate		
	Acetone	8 ug/L	None
	Di-n-butylphthalate	9 ug/L	None
	Bis(2-ethylhexyl)phthalate	15 ug/L	15U ug/L[1]
	Butylbenzylphthalate	2 ug/L	None
	Pesticides/PCBs	ND	None
WF017	**Client ID:** 31R00101 **Laboratory ID:** RB592020 **Collection Date:** 5/22/96 **Type:**		
	Acetone	17 ug/L	None
	Di-n-butylphthalate	6 ug/L	None
	Bis(2-ethylhexyl)phthalate	6 ug/L	10U ug/L[1]
	Pesticides/PCBs	ND	None

Table IX
Summary of Field Blank Contamination
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF017	**Client ID:** 31T00301 **Laboratory ID:** RB592021 **Collection Date:** 5/22/96 **Type:** Trip Blank		
	Acetone	4 ug/L	None
WF017	**Client ID:** BKT00301 **Laboratory ID:** RB592023 **Collection Date:** 5/21/96 **Type:** Trip Blank		
	Acetone	3 ug/L	None
WF018	**Client ID:** 30T00101 **Laboratory ID:** RB602011 **Collection Date:** 5/23/96 **Type:** Trip Blank		
	Methylene chloride	3 ug/L	None
	Acetone	10 ug/L	None
WF018	**Client ID:** 30R00101 **Laboratory ID:** RB602010 **Collection Date:** 5/23/96 **Type:** Rinsate		
	Acetone	6 ug/L	None
	Di-n-butylphthalate	9 ug/L	None
WF019	**Client ID:** 30T00201 **Laboratory ID:** MB047011 **Collection Date:** 6/4/96 **Type:** Trip Blank		
	Volatiles	ND	None
WF019	**Client ID:** 30T00301 **Laboratory ID:** MB068002 **Collection Date:** 6/5/96 **Type:** Trip Blank		
	Volatiles	ND	None
WF019	**Client ID:** 30R00201 **Laboratory ID:** MB047010 **Collection Date:** 6/4/96 **Type:** Rinsate		
	Volatiles	ND	None
	Di-n-butylphthalate	3 ug/L	None
	Bis(2-ethylhexyl)phthalate	4 ug/L	10U ug/L[1]

Table IX
Summary of Field Blank Contamination
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF019	**Client ID:** 30R00301 **Laboratory ID:** MB068001 **Collection Date:** 6/5/96 **Type:** Rinsate		
	Methylene chloride	3 ug/L	None
	Di-n-butylphthalate	7 ug/L	None
	Bis(2-ethylhexyl)phthalate	4 ug./L	None
WF019	**Client ID:** 30F00101 **Laboratory ID:** MB068003 **Collection Date:** 6/5/96 **Type:** Source Blank		
	Acetone	29 ug/L	None
	Di-n-butylphthalate	13 ug/L	None
WF020	**Client ID:** 33T00101 **Laboratory ID:** MB080017 **Collection Date:** 6/6/96 **Type:** Trip Blank		
	Volatiles	ND	None
WF020	**Client ID:** 33R00101 **Laboratory ID:** MB080016 **Collection Date:** 6/6/96 **Type:** Rinsate		
	Acetone	15 ug/L	None
	Di-n-butylphthalate	13 ug/L	None
	Bis(2-ethylhexyl)phthalate	3 ug/L	10U ug/L[1]

[1] = sample result was modified based on an associated method blank concentration.

Note: see detailed data validation report for the discrete qualifiers.

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Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike and Laboratory Duplicate Samples
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Client ID	Analyte	Criteria		% Recovery		RPD	Qualifier
			% Recovery	RPD	MS	MSD		
WF016	BKB00401	All metals Cyanide	- -	- -	- -	- -	- -	None None
WF016	BKR00201	Metals	-	-	-	-	-	None
WF016	BKF00101	Cyanide	-	-	-	-	-	None
WF017	31B00601	Lead Cyanide	75-125 -	≤35 -	179.2 -	- -	49.3 -	J None
WF018	30B00202	Lead	-	-	-	-	-	None
WF019	30B00502	Lead	-	-	-	-	-	None
WF019	30F00101	Lead	-	-	-	-	-	None
WF019	30B00601	Lead	75-125	-	66.4	-	-	J
WF020	33B00302	Lead	-	-	-	-	-	None

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF016	**Client ID**	**BKB00401**	**BKB00401D**	
	Laboratory ID	**RB583003**	**RB583004**	
	Collection Date	**5/20/96**	**5/20/96**	
	Aluminum	3600 mg/Kg	2290 mg/Kg	44
	Arsenic	0.54 mg/Kg	0.79 mg/Kg	38
	Barium	7.2 mg/Kg	6.4 mg/Kg	12
	Beryllium	ND	0.07 mg/Kg	Not calculable
	Calcium	194 mg/Kg	203 mg/Kg	5
	Chromium	3.2 mg/Kg	2.4 mg/Kg	29
	Cobalt	0.77 mg/Kg	0.58 mg/Kg	28
	Copper	1.8 mg/Kg	1.7 mg/Kg	6
	Iron	2220 mg/Kg	1660 mg/Kg	29
	Lead	1.4 mg/Kg	2.4 mg/Kg	53
	Magnesium	114 mg/Kg	93.0 mg/Kg	20
	Manganese	19.5 mg/Kg	14.5 mg/Kg	29
	Nickel	1.5 mg/Kg	ND	Not calculable
	Potassium	84.5 mg/Kg	ND	Not calculable
	Sodium	27.6 mg/Kg	22.5 mg/Kg	20
	Vavadium	4.9 mg/Kg	3.4 mg/Kg	36
	Zinc	3.9 mg/Kg	2.7 mg/Kg	36
	Cyanide	0.10 mg/Kg	0.13 mg/Kg	26
WF016	**Client ID**	**BKB00602**	**BKB00602D**	
	Laboratory ID	**RB583016**	**RB583017**	
	Collection Date	**5/21/96**	**5/21/96**	
	Aluminum	5040 mg/Kg	6050 mg/Kg	18
	Arsenic	1.4 mg/Kg	0.95 mg/Kg	38
	Barium	5.2 mg/Kg	5.9 mg/Kg	13
	Calcium	210 mg/Kg	195 mg/Kg	7
	Chromium	4.5 mg/Kg	4.7 mg/Kg	4
	Copper	2.0 mg/Kg	2.3 mg/Kg	14
	Iron	3430 mg/Kg	3820 mg/Kg	11
	Lead	1.8 mg/Kg	1.7 mg/Kg	6
	Magnesium	97.6 mg/Kg	111 mg/Kg	13
	Manganese	9.5 mg/Kg	11.1 mg/Kg	16
	Nickel	1.6 mg/Kg	ND	Not calculable
	Sodium	28.6 mg/Kg	26.2 mg/Kg	9
	Vanadium	10.3 mg/Kg	11.3 mg/Kg	9
	Zinc	3.2 mg/Kg	3.1 mg/Kg	3
	Cyanide	0.13 mg/Kg	0.16 mg/Kg	21

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF017	**Client ID**	**31B00601**	**31B00601D**	
	Laboratory ID	**RB295001**	**RB592006**	
	Collection Date	**5/21/96**	**5/21/96**	
	Aluminum	1580 mg/Kg	1760 mg/Kg	11
	Arsenic	0.44 mg/Kg	0.29 mg/Kg	41
	Barium	7.4 mg/Kg	9.6 mg/Kg	26
	Beryllium	0.07 mg/Kg	0.07 mg/Kg	0
	Cadmium	0.52 mg/Kg	0.68 mg/Kg	27
	Calcium	237 mg/Kg	297 mg/Kg	22
	Chromium	3.9 mg/Kg	5.4 mg/Kg	32
	Copper	11.4 mg/Kg	13.6 mg/Kg	18
	Iron	1120 mg/Kg	1310 mg/Kg	16
	Lead	6.3 mg/Kg	7.0 mg/Kg	11
	Magnesium	83.5 mg/Kg	98.7 mg/Kg	17
	Manganese	9.2 mg/Kg	11.3 mg/Kg	20
	Mercury	0.07 mg/Kg	0.08 mg/Kg	13
	Selenium	0.14 mg/Kg	ND mg/Kg	Not calculable
	Silver	1.1 mg/Kg	1.7 mg/Kg	43
	Sodium	23.5 mg/Kg	26.3 mg/Kg	11
	Vanadium	2.2 mg/Kg	2.4 mg/Kg	9
	Zinc	11.0 mg/Kg	15.9 mg/Kg	36
	Cyanide	0.10 mg/Kg	ND	Not calculable
WF017	**Client ID**	**12B00101**	**12B00101D**	
	Laboratory ID	**RB592007**	**RB592008**	
	Collection Date	**5/21/96**	**5/21/96**	
	Aluminum	25400 mg/Kg	8890 mg/Kg	96
	Arsenic	5.3 mg/Kg	1.2 mg/Kg	126
	Barium	18.0 mg/Kg	14.5 mg/Kg	22
	Beryllium	0.20 mg/Kg	ND	Not calculable
	Cadmium	0.57 mg/Kg	ND	Not calculable
	Calcium	495 mg/Kg	552 mg/Kg	11
	Chromium	19.9 mg/Kg	9.1 mg/Kg	74
	Copper	6.3 mg/Kg	2.9 mg/Kg	74
	Iron	16100 mg/Kg	8620 mg/Kg	61
	Lead	4.7 mg/Kg	3.4 mg/Kg	32
	Magnesium	170 mg/Kg	96.7 mg/Kg	55
	Manganese	7.7 mg/Kg	4.9 mg/Kg	44
	Mercury	0.04 mg/Kg	0.04 mg/Kg	0
	Nickel	2.5 mg/Kg	ND	Not calculable
	Potassium	81.2 mg/Kg	ND	Not calculable
	Sodium	49.8 mg/Kg	33.4 mg/Kg	39
	Vanadium	41.7 mg/Kg	26.5 mg/Kg	45
	Zinc	3.6 mg/Kg	3.7 mg/Kg	3
	Cyanide	ND	ND	None
WF018	**Client ID**	**30B00202**	**30B00202D**	
	Laboratory ID	**RB602002**	**RB602005**	
	Collection Date	**5/23/96**	**5/23/96**	
	Lead	1.8 mg/Kg	1.9 mg/Kg	5
WF019	**Client ID**	**30B00502**	**30B00502D**	
	Laboratory ID	**MB047002**	**MB047005**	
	Collection Date	**6/4/96**	**6/4/96**	
	Lead	4.3 mg/Kg	3.9 mg/Kg	10
WF019	**Client ID**	**30B00602**	**30B00602D**	
	Laboratory ID	**MB068005**	**MB068009**	
	Collection Date	**6/5/96**	**6/5/96**	
	Lead	4.5 mg/Kg	5.0 mg/Kg	11

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF020	**Client ID** **Laboratory ID** **Collection Date** Lead	**33B00302** **MB080002** **6/6/96** 7.8 mg/Kg	**33B00302D** **MB080007** **6/6/96** 7.1 mg/Kg	9
WF020	**Client ID** **Laboratory ID** **Collection Date** Lead	**33B00102** **MB080013** **6/6/96** 7.2 mg/Kg	**33B00102D** **MB080015** **6/6/96** 8.0 mg/Kg	11

Table XII
Summary of Analytes Exceeding Instrument Calibration
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Date	Analyte	Criteria		Qualifier
			Initial Calibration r	Continuing Calibration %R	
WF016	All	All metals Cyanide	- -	- -	None None
WF017	All	All metals Cyanide	- -	- -	None None
WF018	All	Lead	-	-	None
WF019	All	Lead	-	-	None
WF020	All	Lead	-	-	None

Notes: r = correlation coefficient for initial calibrations

%R = percent recovery for continuing calibrations

J = the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample because QC criteria were not met (validation "J").

UJ = the analyte was not detected above the reported sample IDL. However, the reported sample is approximate; the analyte concentration may not reliably be presumed to be less than the IDL value.

R = the sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Table XIII
Summary of Method Blank Contamination
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF016	Barium	1.760 ug/L	All water samples in SDG WF016
	Iron	31.120 ug/L	
	Sodium	88.880 ug/L	
	Zinc	16.920 ug/L	
	Aluminum	3.309 mg/Kg	All soil samples in SDG WF016
	Calcium	11.435 mg/Kg	
	Copper	0.249 mg/Kg	
	Iron	1.650 mg/Kg	
	Sodium	5.214 mg/Kg	
	Thallium	0.001 mg/Kg	
	Zinc	1.342 mg/Kg	
	Cyanide	ND	All samples in SDG WF016
WF017	Barium	1.760 ug/L	All water samples in SDG WF017
	Iron	31.120 ug/L	
	Sodium	88.880 ug/L	
	Zinc	16.920 ug/L	
	Aluminum	3.309 mg/Kg	All soil samples in SDG WF017
	Calcium	11.435 mg/Kg	
	Cobalt	0.249 mg/Kg	
	Copper	1.650 mg/Kg	
	Sodium	5.214 mg/Kg	
	Zinc	1.342 mg/Kg	
	Cyanide	ND	All samples in SDG WF017
WF018	Lead	ND	All samples in SDG WF018
WF019	Lead	2.260 ug/L	All water samples in SDG WF019
WF020	Lead	ND	All samples in SDG WF020

Table XIV
Summary of Field Blank Contamination
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Parameter	Concentration	Qualifier
WF016	**Client ID:** BKR00201		
	Laboratory ID: RB583008		
	Collection Date: 5/20/96		
	Type: Rinsate		
	Barium	1.8 ug/L	1.7U ug/L[1]
	Iron	5.6 ug/L	5.6U ug/L[1]
	Lead	2.3 ug/L	None
	Sodium	57.5 ug/L	57.5U ug/L[1]
	Zinc	3.0 ug/L	3.0U ug/L[1]
	Cyanide	1.8 ug/L	None
WF016	**Client ID:** BKF00101		
	Laboratory ID: RB583009		
	Collection Date: 5/20/96		
	Type: Source Blank		
	Iron	6.4 ug/L	6.4U ug/L[1]
	Sodium	52.9 ug/L	52.9U ug/L[1]
	Zinc	3.8 ug/L	3.8U ug/L[1]
	Cyanide	ND	None
WF017	**Client ID:** 31R00101		
	Laboratory ID: RB592020		
	Collection Date: 5/22/96		
	Type: Rinsate		
	Aluminum	86.5 ug/L	None
	Barium	2.3 ug/L	2.3U ug/L[1]
	Calcium	503 ug/L	None
	Chromium	11.3 ug/L	None
	Copper	1.4 ug/L	None
	Iron	132 ug/L	132U ug/L[1]
	Lead	0.60 ug/L	None
	Magnesium	66.2 ug/L	None
	Manganese	3.8 ug/L	None
	Sodium	264 ug/L	None
	Zinc	7.8 ug/L	7.8U ug/L[1]
	Cyanide	ND	None
WF017	**Client ID:** 12R00101		
	Laboratory ID: RB592022		
	Collection Date: 5/21/96		
	Type: Rinsate		
	Aluminum	19.1 ug/L	None
	Barium	1.8 ug/L	1.8U ug/L[1]
	Calcium	86.5 ug/L	None
	Iron	15.6 ug/L	15.6U ug/L[1]
	Lead	0.60 ug/L	None
	Magnesium	30.5 ug/L	None
	Sodium	59.8 ug/L	None
	Zinc	3.8 ug/L	3.8U ug/L[1]
	Cyanide	ND	None

Table XIV
Summary of Field Blank Contamination
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Parameter	Concentration	Qualifier
WF018	**Client ID:** 30R00101 **Laboratory ID:** RB602010 **Collection Date:** 5/23/96 **Type:** Rinsate		
	Lead	ND	None
WF019	**Client ID:** 30R00201 **Laboratory ID:** MB047010 **Collection Date:** 6/4/96 **Type:** Rinsate		
	Lead	ND	None
WF019	**Client ID:** 30R00301 **Laboratory ID:** MB068001 **Collection Date:** 6/5/96 **Type:** Rinsate		
	Lead	ND	None
WF019	**Client ID:** 30F00101 **Laboratory ID:** MB068003 **Collection Date:** 6/5/96 **Type:** Source Blank		
	Lead	2.1 ug/L	2.1U ug/L[1]
WF020	**Client ID:** 33R00101 **Laboratory ID:** MB080016 **Collection Date:** 6/6/96 **Type:** Rinsate		
	Lead	1.6 ug/L	None

[1] = sample result was modified based on an associated method blank concentration.

Note: see detailed data validation report for the discrete qualifiers.

Table XV
Sample Event PARCC Summary
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton, Florida

SDG	Fraction	Precision[1]	Accuracy[2]	Representativeness	Completeness (%)	Comparability
WF016	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF017	Volatiles	Acceptable	Acceptable	Acceptable	100[3]	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF018	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Lead	Acceptable	Acceptable	Acceptable	100	Acceptable
WF019	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100[3]	Acceptable
	Lead	Acceptable	Acceptable	Acceptable	100	Acceptable
WF020	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Lead	Acceptable	Acceptable	Acceptable	100	Acceptable

[1]Cumulative of sampling and analytical components.
[2]Analytical component.
[3]Samples results rejected for database purposes were not used in the completeness calculation.

Notes: All completeness is expressed as the ratio of number of sample results considered usable (i.e., not qualified as rejected) to the total number of sample results.

% = *percent*

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APPENDIX A

Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida
PARCC Summary Tables

Final Version

5/1/96

APPENDIX A

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Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton, Florida

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Tab

SDG#: WF006 **Sample Delivery Group Versus Sample Identification** **L** **:** 1779A

Project Name: NAS Whiting Field Parameters/Analytical Method **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide	TRPH
01T00101	G8864001	TB	water	12-5-95	X					
01S00101	G8864002		soil	12-5-95	X	X	X	X	X	
01S00201	G8864003		soil	12-5-95	X	X	X	X	X	
01S00301	G8864004		soil	12-5-95	X	X	X	X	X	
01S00401	G8864005		soil	12-5-95	X	X	X	X	X	
01S00501	G8864006		soil	12-5-95	X	X	X	X	X	
02S00401	G8864007	FD	soil	12-5-95	X	X	X	X	X	
02S00401D	G8864008	FD	soil	12-5-95	X	X	X	X	X	
02S00401DDL	G8864008DL		soil	12-5-95		X				
02T00101	G8876001	TB	water	12-6-95	X					
02S00101	G8876002		soil	12-6-95	X	X	X	X	X	
02S00201	G8876003		soil	12-6-95	X	X	X	X	X	
02S00301	G8876004		soil	12-6-95	X	X	X	X	X	
02S00501	G8876005		soil	12-6-95	X	X	X	X	X	
09S00101	G8876006		soil	12-6-95	X	X	X	X	X	X
09S00201	G8876007		soil	12-6-95	X	X	X	X	X	X
09S00401	G8876008		soil	12-6-95	X	X	X	X	X	X
09S00501	G8876009		soil	12-6-95	X	X	X	X	X	X
09S00301	G8876010	FD	soil	12-6-95	X	X	X	X	X	X
09S00301D	G8876011	FD	soil	12-6-95	X	X	X	X	X	X
01R00101	G8876012	R	water	12-6-95	X	X	X	X	X	X
01F00101	G8876013	SB	water	12-6-95	X	X	X	X	X	X
02S00401MS	G8864007MS	MS	soil	12-5-95	X	X	X	X	X	

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

Table I

SDG#: WF006 — **Sample Delivery Group Versus Sample Identification** — **LDC#:** 1779A

Project Name: NAS Whiting Field — Parameters/Analytical Method — **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide	TRPH
02S00401MSD	G8864007MSD	MSD	soil	12-5-95	X	X	X	X	X	
09S00101MS	G8876006MS	MS	soil	12-6-95						X
09S00101DUP	G8876006MSD	DUP	soil	12-6-95						X

T[illegible] Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

Ta'

SDG#: WF007 **Sample Delivery Group Versus Sample Identification** **L. #:** 1779B

Project Name: NAS Whiting Field Parameters/Analytical Method **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide	TRPH
10T00101	G8889001	TB	water	12-7-95	X					
10S00101	G8889002	FD	soil	12-7-95	X	X	X	X	X	X
10S00101R	G8889002R		soil	12-7-95		X				
10S00101D	G8889003	FD	soil	12-7-95	X	X	X	X	X	X
10S00401	G8889004		soil	12-7-95	X	X	X	X	X	X
10S00601	G8889005		soil	12-7-95	X	X	X	X	X	X
12S00301	G8889006		soil	12-7-95	X	X	X	X	X	X
12S00101	G8889007		soil	12-7-95	X	X	X	X	X	X
12S00601	G8889008		soil	12-7-95	X	X	X	X	X	X
10R00101	G8889009	R	water	12-7-95	X	X	X	X	X	X
13T00101	G8895001	TB	water	12-8-95	X					
13S00101	G8895002		soil	12-8-95	X	X	X	X	X	
13S00201	G8895003		soil	12-8-95	X	X	X	X	X	
13S00301	G8895004		soil	12-8-95	X	X	X	X	X	
13S00401	G8895005		soil	12-8-95	X	X	X	X	X	
13S00501	G8895006		soil	12-8-95	X	X	X	X	X	
14S00101	G8895007	FD	soil	12-8-95	X	X	X	X	X	
14S00101D	G8895008	FD	soil	12-8-95	X	X	X	X	X	
14S00201	G8895009		soil	12-8-95	X	X	X	X	X	
14S00301	G8895010		soil	12-8-95	X	X	X	X	X	
10S00101MS	G8889002MS	MS	soil	12-7-95	X		X	X	X	X
10S00101MSD	G8889002MSD	MSD	soil	12-7-95	X		X	X	X	X
10S00101RMS	G8889002RMS	MS	soil	12-7-95		X				

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

Table I

SDG#: WF007 **Sample Delivery Group Versus Sample Identification** **LDC#:** 1779B

Project Name: NAS Whiting Field Parameters/Analytical Method **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide	TRPH
10S00101RMSD	G8889002RMSD	MSD	soil	12-7-95		X				

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

Tab

SDG#: WF008 **Sample Delivery Group Versus Sample Identification** L : 1779C

Project Name: NAS Whiting Field Parameters/Analytical Method **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide
15T00101	G8913001	TB	water	12-9-95	X				
15S02001	G8913002	FD	soil	12-9-95	X	X	X	X	X
15S02001D	G8913003	FD	soil	12-9-95	X	X	X	X	X
15S02101	G8913004		soil	12-9-95	X	X	X	X	X
15S02201	G8913005		soil	12-9-95	X	X	X	X	X
15S02301	G8913006		soil	12-9-95	X	X	X	X	X
15S02401	G8913007		soil	12-9-95	X	X	X	X	X
15S02501	G8913008		soil	12-9-95	X	X	X	X	X
15S01501	G8913009		soil	12-9-95	X	X	X	X	X
15S01401	G8913010		soil	12-9-95	X	X	X	X	X
15S01301	G8913011		soil	12-9-95	X	X	X	X	X
15S01601	G8913012		soil	12-10-95	X	X	X	X	X
15S01701	G8913013	FD	soil	12-10-95	X	X	X	X	X
15S01701D	G8913014	FD	soil	12-10-95	X	X	X	X	X
15S01801	G8913015		soil	12-10-95	X	X	X	X	X
15S01901	G8913016		soil	12-10-95	X	X	X	X	X
15S00901	G8913017		soil	12-11-95	X	X	X	X	X
15S00901RE	G8913017RE		soil	12-11-95		X			
15R00101	G8913020	R	water	12-11-95	X	X	X	X	X
15S02001MS	G8913002MS	MS	soil	12-9-95	X	X	X	X	X
15S02001MSD	G8913002MSD	MSD	soil	12-9-95	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

Table I

SDG#: WF009 | **Sample Delivery Group Versus Sample Identification** | **LDC#:** 1779D

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide
15T00201	G8914001	TB	water	12-11-95	X				
15S00101	G8914002	FD	soil	12-11-95	X	X	X	X	X
15S00101R	G8914002R		soil	12-11-95		X			
15S00101D	G8914003	FD	soil	12-11-95	X	X	X	X	X
15S00201	G8914004		soil	12-11-95	X	X	X	X	X
15S00301	G8914005		soil	12-11-95	X	X	X	X	X
15S00501	G8914006		soil	12-11-95	X	X	X	X	X
15S00401	G8914007		soil	12-11-95	X	X	X	X	X
15S00601	G8914008		soil	12-11-95	X	X	X	X	X
15S00701	G8914009		soil	12-11-95	X	X	X	X	X
15S00801	G8914010		soil	12-11-95	X	X	X	X	X
15S01201	G8914011		soil	12-11-95	X	X	X	X	X
15R00201	G8914012	R	water	12-11-95	X	X	X	X	X
15S01101	G8914013		soil	12-10-95	X	X	X	X	X
15S01001	G8914014		soil	12-10-95	X	X	X	X	X
15S00101MS	G8914002MS	MS	soil	12-11-95	X	X	X	X	X
15S00101MSD	G8914002MSD	MSD	soil	12-11-95	X	X	X	X	X
15S00101RMS	G8914002RMS	MS	soil	12-11-95		X			
15S00101RMSD	G8914002RMSD	MSD	soil	12-11-95		X			

TP = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

Ta

SDG#: WF010 **Sample Delivery Group Versus Sample Identification** **L #:** 1779E

Project Name: NAS Whiting Field Parameters/Analytical Method **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide
31S00101	G8924001		soil	12-12-95	X	X	X	X	X
31S00201	G8924002		soil	12-12-95	X	X	X	X	X
31S00301	G8924003		soil	12-12-95	X	X	X	X	X
31S00401	G8924004		soil	12-12-95	X	X	X	X	X
31T00101	G8924005	TB	water	12-12-95	X				
31R00101	G8924006	R	water	12-12-95	X	X	X	X	X
31T00201	G8938001	TB	water	12-13-95	X				
31S01501	G8938002	FD	soil	12-13-95	X	X	X	X	X
31S01501D	G8938003	FD	soil	12-13-95	X	X	X	X	X
31S01601	G8938004		soil	12-13-95	X	X	X	X	X
31S01701	G8938005		soil	12-13-95	X	X	X	X	X
31S01801	G8938006		soil	12-13-95	X	X	X	X	X
31S01901	G8938007		soil	12-13-95	X	X	X	X	X
31S01501MS	G8938002MS	MS	soil	12-13-95	X	X	X	X	X
31S01501MSD	G8938002MSD	MSD	soil	12-13-95	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

Table I

SDG#: WF11A | **Sample Delivery Group Versus Sample Identification** | **LDC#:** 1777A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide	TRPH
09W00101	RA903001	FD	water	1-5-96	X	X	X	X	X	X
09W00101D	RA903002	FD	water	1-5-96	X	X	X	X	X	X
16W00101	RA903003		water	1-5-96	X	X	X	X	X	
09W00101MS	RA903001MS	MS	water	1-5-96	X	X	X	X	X	X
09W00101MSD	RA903001MSD	MSD	water	1-5-96	X	X	X	X	X	X

= Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

Ta

SDG#: WF11B | **Sample Delivery Group Versus Sample Identification** | **LDC#:** 1777B

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide	TRPH
12T00101	RA847001	TB	water	1-5-96	X					
10S00201	RA847002	FD	soil	1-5-96	X	X	X	X	X	X
10S00201DL	RA847002DL		soil	1-5-96		X				
10S00201D	RA847003	FD	soil	1-5-96	X	X	X	X	X	X
10S00301	RA847004		soil	1-5-96	X	X	X	X	X	X
10S00301R	RA847004R		soil	1-5-96		X				
10S00501	RA847005		soil	1-5-96	X	X	X	X	X	X
12S00201	RA847006		soil	1-5-96	X	X	X	X	X	X
12S00401	RA847007		soil	1-5-96	X	X	X	X	X	X
12S00501	RA847008		soil	1-5-96	X	X	X	X	X	X
12R00101	RA847012	R	water	1-5-96	X	X	X	X	X	X
11T00101	RA847013	TB	water	1-6-96	X					
11S00101	RA847014		soil	1-6-96	X	X	X	X	X	X
11S00201	RA847015		soil	1-6-96	X	X	X	X	X	X
11S00201DL	RA847015DL		soil	1-6-96			X			
11S00201R	RA847015R		soil	1-6-96	X					
11S00501	RA847016		soil	1-6-96	X	X	X	X	X	X
11S00401	RA847017		soil	1-7-96	X	X	X	X	X	X
11S00301	RA847018		soil	1-7-96	X	X	X	X	X	X
10S00201MS	RA847002MS	MS	soil	1-5-96	X	X	X	X	X	X
10S00201MSD	RA847002MSD	MSD	soil	1-5-96	X	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

Table I

SDG#: WF012 **Sample Delivery Group Versus Sample Identification** **LDC#:** 1777C

Project Name: NAS Whiting Field Parameters/Analytical Method **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/ PCBs	Metals	Cyanide	Lead	TCLP Metals
11S00601	RA855001	FD	soil	1-7-96						X	
11S00601D	RA855002	FD	soil	1-7-96						X	
11S00701	RA855003		soil	1-7-96						X	
11S00801	RA855004		soil	1-7-96						X	
11S00901	RA855005		soil	1-7-96						X	
11S01001	RA855006		soil	1-7-96						X	
11S01101	RA855007		soil	1-7-96						X	
11S01201	RA855008		soil	1-7-96						X	
11S01301	RA855009		soil	1-7-96						X	
31S00401	RA855010		soil	1-7-96	X	X	X	X	X		
31S00501	RA855011	FD	soil	1-7-96	X	X	X	X	X		
31S00501D	RA855012	FD	soil	1-7-96	X	X	X	X	X		
31S00601	RA855013		soil	1-7-96	X	X	X	X	X		
31S00701	RA855014		soil	1-7-96	X	X	X	X	X		
31S01001	RA855015		soil	1-7-96	X	X	X	X	X		
31S01101	RA855016		soil	1-7-96	X	X	X	X	X		
31S00901	RA855017		soil	1-7-96	X	X	X	X	X		
31S00801	RA855018		soil	1-7-96	X	X	X	X	X		
31S01201	RA855019		soil	1-8-96	X	X	X	X	X		
31S01201R	RA855019R		soil	1-8-96	X						
31S01301	RA855020		soil	1-8-96	X	X	X	X	X		
31R00201	RA855021	R	water	1-8-96	X	X	X	X	X		
31S00401	RA857001		soil	1-7-96							X

Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

Tab

SDG#: WF012 **Sample Delivery Group Versus Sample Identification** L #: 1777C

Project Name: NAS Whiting Field Parameters/Analytical Method **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/ PCBs	Metals	Cyanide	Lead	TCLP Metals
31S00501	RA857002	FD	soil	1-7-96							X
31S00501D	RA857003	FD	soil	1-7-96							X
31S00601	RA857004		soil	1-7-96							X
31S00701	RA847005		soil	1-7-96							X
31S01001	RA857006		soil	1-7-96							X
31S01101	RA857007		soil	1-7-96							X
31S00901	RA857008		soil	1-7-96							X
31S00801	RA857009		soil	1-7-96							X
31S01201	RA857010		soil	1-8-96							X
31S01301	RA857011		soil	1-8-96							X
31S00501MS	RA855011MS	MS	soil	1-7-96	X	X	X	X	X		
31S00501MSD	RA855011MSD	MSD	soil	1-7-96	X	X	X	X	X		
31S00501MS	RA857002MS	MS	soil	1-7-96							X
31S00501MSD	RA857002MSD	MSD	soil	1-7-96							X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

Table I

SDG#: WF013 | **Sample Delivery Group Versus Sample Identification** | **LDC#:** 1777D

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/ PCBs	Metals	Cyanide
16S00101	RA856001	FD	soil	1-8-96	X	X	X	X	X
16S00501	RA856002		soil	1-8-96	X	X	X	X	X
16S00401	RA856003		soil	1-8-96	X	X	X	X	X
16S00901	RA856004		soil	1-8-96	X	X	X	X	X
16S00901R	RA856004R		soil	1-8-96		X			
16S01501	RA856005		soil	1-8-96	X	X	X	X	X
16S00201	RA856006		soil	1-9-96	X	X	X	X	X
16S00301	RA856007		soil	1-9-96	X	X	X	X	X
16S00801	RA856008		soil	1-9-96	X	X	X	X	X
16S00801RE	RA856008RE		soil	1-9-96		X			
16S00601	RA856009		soil	1-9-96	X	X	X	X	X
16S00601DL	RA856009DL		soil	1-9-96		X			
16S01201	RA856010		soil	1-9-96	X	X	X	X	X
16S01301	RA856011		soil	1-9-96	X	X	X	X	X
BKS00301	RA856012		soil	1-9-96	X	X	X	X	X
BKS00101	RA856013		soil	1-9-96	X	X	X	X	X
16S01001	RA856014	FD	soil	1-9-96	X	X	X	X	X
16S01001D	RA856015	FD	soil	1-9-96	X	X	X	X	X
16T00101	RA856016	TB	water	1-9-96	X				
16R00101	RA856017	R	water	1-9-96	X	X	X	X	X
16S00101D	RA856018	FD	soil	1-9-96	X	X	X	X	X
24T00101	RA871001	TB	water	1-10-96	X				
24S00101	RA871002		soil	1-10-96	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

Table 1

SDG#: WF013 | **Sample Delivery Group Versus Sample Identification** | **L[illegible]#:** 1777D

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/ PCBs	Metals	Cyanide
16S01001MS	RA856014MS	MS	soil	1-9-96	X	X	X	X	X
16S01001MSD	RA856014MSD	MSD	soil	1-9-96	X	X	X	X	X
24S00101MS	RA871002MS	MS	soil	1-10-96					X
24S00101MSD	RA871002MSD	MSD	soil	1-10-96					X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

Table I

SDG#: WF014 | **Sample Delivery Group Versus Sample Identification** | **LDC#:** 1777E

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide
BKR00101	RA870001	R	water	1-10-96	X	X	X	X	X
BKT00101	RA870002	TB	water	1-10-96	X				
16S01401	RA870003		soil	1-10-96	X	X	X	X	X
16S00701	RA870004		soil	1-10-96	X	X	X	X	X
16S01101	RA870005		soil	1-10-96	X	X	X	X	X
16S01701	RA870006		soil	1-10-96	X	X	X	X	X
16S01601	RA870007		soil	1-10-96	X	X	X	X	X
BKS00201	RA870008	FD	soil	1-10-96	X	X	X	X	X
BKS00201D	RA870009	FD	soil	1-10-96	X	X	X	X	X
BKS00501	RA870010		soil	1-10-96	X	X	X	X	X
BKS00401	RA870011		soil	1-10-96	X	X	X	X	X
31B00401	RA870012		soil	1-11-96	X	X	X	X	X
31B00301	RA870013		soil	1-11-96	X	X	X	X	X
31B00201	RA870014	FD	soil	1-11-96	X	X	X	X	X
31B00201D	RA870015	FD	soil	1-11-96	X	X	X	X	X
31B00101	RA870016		soil	1-11-96	X	X	X	X	X
31B00501	RA870017		soil	1-11-96	X	X	X	X	X
31T00201	RA870018	TB	water	1-11-96	X				
BKS00201MS	RA870008MS	MS	soil	1-10-96	X	X	X	X	X
BKS00201MSD	RA870008MSD	MSD	soil	1-10-96	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

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SDG#: WF015 **Sample Delivery Group Versus Sample Identification** **L. #:** 1777F

Project Name: NAS Whiting Field Parameters/Analytical Method **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide
COR00101	RA908001	R	water	1-18-96	X	X	X	X	X
COF00101	RA908002	SB	water	1-18-96	X	X	X	X	X
COT00101	RA908003	TB	water	1-18-96	X				
COS00101	RA908004	FD	soil	1-18-96	X	X	X	X	X
COS00101D	RA908005	FD	soil	1-18-96	X	X	X	X	X
EOS00101	RA908006		soil	1-18-96	X	X	X	X	X
POS00101	RA908007		soil	1-18-96	X	X	X	X	X
YOS00101	RA908008		soil	1-18-96	X	X	X	X	X
SOS00101	RA908009		soil	1-18-96	X	X	X	X	X
WOS00101	RA908010		soil	1-18-96	X	X	X	X	X
AOS00101	RA908011		soil	1-18-96	X	X	X	X	X
COS00101MS	RA908004MS	MS	soil	1-18-96	X	X	X	X	X
COS00101MSD	RA908004MSD	MSD	soil	1-18-96	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

Table II
Summary of Rejected Data (Organics)
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Fraction	Sample	Compound	Reason
WF006	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBS	All samples	No rejected results	-
WF007	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF008	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF009	Volatiles	All samples	No rejected results	-
	Semivolatiles	15S00201	1,4-Dichlorobenzene	Low MS/MSD recoveries
			1,2,4-Trichlorobenzene	Low MS/MSD recoveries
			Acenaphthene	Low MS/MSD recoveries
			Pyrene	MS/MSD recoveries
	Pesticides & PCBs	All samples	No rejected results	-
WF010	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF11A	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF11B	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF012	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF013	Volatiles	All samples	No rejected results	-
	Semivolatiles	16S00801	All compounds	Low Surrogate recoveries
	Pesticides & PCBs	All samples	No rejected results	-
WF014	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF015	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	COS00101	All compounds	Low Surrogate recoveries
		SOS00101	All compounds	Low Surrogate recoveries

Table III
Summary of Rejected Data (Inorganics)
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes				
SDG	**Fraction**	**Sample**	**Analyte**	**Reason**
WF006	All metals Cyanide TRPH	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF007	All metals Cyanide TRPH	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF008	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF009	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF010	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF11A	All metals Cyanide TRPH	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF11B	All metals Cyanide TRPH	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF012	All metals All TCLP metals Cyanide	All samples All samples All samples	No rejected results No rejected results No rejected results	- -
WF013	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF014	Mercury Cyanide	31B00301 All samples	Mercury No rejected results	Low LCS % Recovery -
WF015	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -

Table IV
Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike/Matrix Spike Duplicates
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Criteria		% Recovery		RPD	Qualifier
			% Recovery	RPD	MS	MSD		
WF006	02S00401	Volatiles	-	-	-	-	-	None
		Phenol	26-90	-	-	92	-	None
		4-Chloro-3-methylphenol	26-103	-	-	104	-	None
		2,4-Dinitrotoluene	28-89	-	-	100	-	None
		Pyrene	35-142	-	29	30	-	None
		Pesticides & PCBs	-	-	-	-	-	None
WF007	10S00101	Volatiles	-	-	-	-	-	None
		4-Chloro-3-methylphenol	26-103	-	111	-	-	None
		Pesticides & PCBs	-	-	-	-	-	None
WF008	15S02001	Volatiles	-	-	-	-	-	None
		1,4-Dichlorobenzene	28-104	≤27	-	14	142	None
		1,2,4-Trichlorobenzene	38-107	≤23	-	12	149	None
		Acenaphthene	-	≤19	-	-	96	None
		2,4-Dinitrotoluene	28-89	-	100	94	-	None
		Pyrene	35-142	≤36	-	6	67	None
		Pesticides & PCBs	-	-	-	-	-	None
WF009	15S00101	Volatiles	-	-	-	-	-	None
		2-Chlorophenol	25-102	≤50	16	-	110	None
		1,4-Dichlorobenzene	28-104	-	0	0	-	R
		1,2,4-Trichlorobenzene	38-107	≤23	0	3	200	R
		Acenaphthene	31-137	≤19	0	9	200	R
		Pentachlorophenol	17-109	≤47	10	-	127	None
		Pyrene	35-142	-	0	0	-	R
		Pesticides & PCBs	-	-	-	-	-	None
WF009	15S00101R	2,4-Dinitrotoluene	28-89	-	-	95	-	UJ

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Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike/Matrix Spike Duplicates
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Criteria		% Recovery		RPD	Qualifier
			% Recovery	RPD	MS	MSD		
WF010	31S01501	Volatiles	-	-	-	-	-	-
		4-Chloro-3-methylphenol	26-103	-	104	-	-	None
		2,4-Dinitrotoluene	28-89	-	94	-	-	None
		Pesticides & PCBs	-	-	-	-	-	-
WF11A	09W00101	Volatiles	-	-	-	-	-	None
		4-Chloro-3-methylphenol	23-97	-	104	107	-	None
		4-Nitrophenol	10-80	-	117	119	-	None
		2,4-Dinitrophenol	24-96	-	106	107	-	None
		Pentachlorophenol	96-103	-	120	119	-	None
		Pesticides & PCBs	-	-	-	-	-	None
WF11B	10S00201	Volatiles	-	-	-	-	-	None
		Pyrene	-	≤36	-	-	39	None
		Pesticides & PCBs	-	-	-	-	-	None
WF012	31S00501	Volatiles	-	-	-	-	-	None
		4-Nitrophenol	11-114	-	120	115	-	None
		Pesticides & PCBs	-	-	-	-	-	None
WF013	16S01001	Volatiles	-	-	-	-	-	None
		Phenol	26-90	-	-	96	-	U
		2-Chlorophenol	25-102	-	-	103	-	U
		Pentachlorophenol	17-109	-	-	110	-	U
		Pesticides & PCBs	-	-	-	-	-	None
WF014	BKS00201	Volatiles	-	-	-	-	-	None
		Pentachlorophenol	17-109	-	133	136	-	None
		4-Nitrophenol	11-114	-	-	132	-	None
		Pesticides & PCBs	-	-	-	-	-	None

Table IV
Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike/Matrix Spike Duplicates
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Criteria		% Recovery		RPD	Qualifier
			% Recovery	RPD	MS	MSD		
WF015	COS00101	Volatiles	-	-	-	-	-	None
		Semivolatiles	-	-	-	-	-	None
		Pesticides & PCBs	-	-	-	-	-	None

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF006	**Client ID**	**02S00401**	**02S00401D**	
	Laboratory ID	**G8864007**	**G8864008**	
	Collection Date	**12/5/95**	**12/5/95**	
	Volatiles	ND	ND	-
	Semivolatiles	ND	ND	-
	Dieldrin	8.3	8.0	4
	Alpha-chlordane	5.6	5.1	9
	Gamma-chlordane	3.5	2.9	19
WF006	**Client ID**	**09S00301**	**09S00301D**	
	Laboratory ID	**G8876010**	**G8876011**	
	Collection Date	**12/6/96**	**12/6/96**	
	Acetone	ND	5 ug/Kg	Not calculable
	Semivolatiles	ND	ND	-
	Pesticides & PCBs	ND	ND	-
WF007	**Client ID**	**10S00101**	**10S00101D**	
	Laboratory ID	**G8889002**	**G8889003**	
	Collection Date	**12/7/95**	**12/7/95**	
	Volatiles	ND	ND	-
	Phenanthrene	280 ug/Kg	1200 ug/Kg	124
	Fluoranthene	660 ug/Kg	2300 ug/Kg	111
	Pyrene	580 ug/Kg	1600 ug/Kg	94
	Benzo(a)anthracene	340 ug/Kg	1200 ug/Kg	112
	Chrysene	500 ug/Kg	1400 ug/Kg	120
	Bis(2-ethylhexyl)phthalate	200 ug/Kg	360U ug/Kg	Not calculable
	Benzo(b)fluoranthene	480 ug/Kg	1300 ug/Kg	92
	Benzo(k)fluoranthene	360 ug/Kg	900 ug/Kg	86
	Benzo(a)pyrene	400 ug/Kg	1000 ug/Kg	86
	Indeno(1,2,3-cd)pyrene	180 ug/Kg	360 ug/Kg	67
	Benzo(g,h,i)perylene	180 ug/Kg	340 ug/Kg	62
	Anthracene	370U ug/Kg	270 ug/Kg	Not calculable
	Carbazole	370U ug/Kg	100 ug/Kg	Not calculable
	Dibenz(a,h)anthracene	370U ug/Kg	170 ug/Kg	Not calculable
	Pesticides & PCBs	ND	ND	-
WF007	**Client ID**	**14S00101**	**14S00101D**	
	Laboratory ID	**G8895007**	**G8895008**	
	Collection Date	**12/8/95**	**12/8/95**	
	Acetone	8 ug/Kg	ND	Not calculable
	Methylene chloride	6 ug/Kg	ND	Not calculable
	Semivolatiles	ND	ND	-
	Pesticides & PCBs	ND	ND	-

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF008	**Client ID**	**15S02001**	**15S02001D**	
	Laboratory ID	**G8913002**	**G8913003**	
	Collection Date	**12/9/95**	**12/9/95**	
	Acetone	5 ug/Kg	ND	Not calculable
	Methylene chloride	ND	5 ug/Kg	Not calculable
	Semivolatiles	ND	ND	-
	Pesticides & PCBs	ND	ND	-
WF008	**Client ID**	**15S01701**	**15S01701D**	
	Laboratory ID	**G8913013**	**G8913014**	
	Collection Date	**12/10/95**	**12/10/95**	
	Acetone	6 ug/Kg	4 ug/Kg	40
	Semivolatiles	ND	ND	-
	Pesticides & PCBs	ND	ND	-
WF009	**Client ID**	**15S00101**	**15S00101D**	
	Laboratory ID	**G8914002**	**G8914003**	
	Collection Date	**12/11/95**	**12/11/95**	
	Acetone	6 ug/Kg	7 ug/Kg	15
	Bis(2-ethylhexyl)phthalate	ND	1700 ug/Kg	Not calculable
	Pesticides & PCBs	ND	ND	-
WF010	**Client ID**	**31S01501**	**31S01501D**	
	Laboratory ID	**G8938002**	**G8938003**	
	Collection Date	**12/13/95**	**12/13/95**	
	Acetone	ND	5 ug/Kg	Not calculable
	Semivolatiles	ND	ND	-
	Pesticides & PCBs	ND	ND	-
WF11A	**Client ID**	**09W00101**	**09W00101D**	
	Laboratory ID	**RA903001**	**RA903002**	
	Collection Date	**1/5/96**	**1/5/96**	
	Toluene	10U ug/L	1 ug/L	Not calculable
	Semivolatiles	ND	ND	-
	Pesticides & PCBs	ND	ND	-

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF11B	**Client ID**	**10S00201**	**10S00201D**	
	Laboratory ID	**RA847002**	**RA847003**	
	Collection Date	**1/5/96**	**1/5/96**	
	Acetone	29 ug/Kg	20 ug/Kg	37
	2-Hexanone	11U ug/Kg	4 ug/Kg	Not calculable
	Phenanthrene	68 ug/Kg	310 ug/Kg	128
	Di-n-butylphthalate	46 ug/Kg	380U ug/Kg	Not calculable
	Fluoranthene	160 ug/Kg	420 ug/Kg	90
	Pyrene	170 ug/Kg	290 ug/Kg	52
	Butylbenzylphthalate	57 ug/Kg	380U ug/Kg	Not calculable
	Benzo(a)anthracene	87 ug/Kg	190 ug/Kg	74
	Chrysene	120 ug/Kg	220 ug/Kg	59
	Bis(2-ethylhexyl)phthalate	3200 ug/Kg	140 ug/Kg	183
	Benzo(a)fluoranthene	150 ug/Kg	200 ug/Kg	28
	Benzo(k)fluoranthene	110 ug/Kg	210 ug/Kg	62
	Benzo(a)pyrene	95 ug/Kg	150 ug/Kg	45
	Indeno(1,2,3-cd)pyrene	58 ug/Kg	56 ug/Kg	4
	Acenaphthene	380U ug/Kg	40 ug/Kg	Not calculable
	Anthracene	380U ug/Kg	54 ug/Kg	Not calculable
	Carbazole	380U ug/Kg	84 ug/Kg	Not calculable
	4,4'-DDT	7.0 ug/Kg	8.9 ug/Kg	24
	Aroclor 1254	340 ug/Kg	390 ug/Kg	14
WF012	**Client ID**	**31S00501**	**31S00501D**	
	Laboratory ID	**RA855011**	**RA855012**	
	Collection Date	**1/7/96**	**1/7/96**	
	Acetone	9 ug/Kg	8 ug/Kg	12
	Semivolatiles	ND	ND	-
	Pesticides & PCBs	ND	ND	-
WF013	**Client ID**	**16S00101**	**16S00101D**	
	Laboratory ID	**RA856001**	**RA856018**	
	Collection Date	**1/8/96**	**1/8/96**	
	Acetone	4 ug/Kg	9 ug/Kg	77
	Bis(2-ethylhexyl)phthalate	45 ug/Kg	380U ug/Kg	Not calculable
	4,4'-DDE	3.2 ug/Kg	2.0 ug/Kg	46
	4,4'-DDT	3.8 ug/Kg	2.7 ug/Kg	34
WF013	**Client ID**	**16S01001**	**16S01001D**	
	Laboratory ID	**RA856014**	**RA856015**	
	Collection Date	**1/9/96**	**1/9/96**	
	Acetone	14 ug/Kg	4 ug/Kg	111
	Bis(2-ethylhexyl)phthalate	60 ug/Kg	58 ug/Kg	3
	Dieldrin	33 ug/Kg	60 ug/Kg	58
	4,4'-DDE	13 ug/Kg	22 ug/Kg	51
	4,4'-DDT	6.4 ug/Kg	9.0 ug/Kg	34
	Alpha-chlordane	6.8 ug/Kg	12 ug/Kg	55
	Gamma-chlordane	4.0 ug/Kg	7.9 ug/Kg	66
	Aroclor 1260	48 ug/Kg	110 ug/Kg	78

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF014	**Client ID**	**BKS00201**	**BKS00201D**	
	Laboratory ID	**RA870008**	**RA870009**	
	Collection Date	**1/10/96**	**1/10/96**	
	Acetone	8 ug/Kg	4 ug/Kg	67
	Bis(2-ethylhexyl)phthalate	370U ug/Kg	45 ug/Kg	Not calculable
	Pesticides & PCBs	ND	ND	-
WF014	**Client ID**	**31B00201**	**31B00201D**	
	Laboratory ID	**RA870014**	**RA870015**	
	Collection Date	**1/11/96**	**1/11/96**	
	Acetone	3 ug/Kg	11U ug/Kg	Not calculable
	Bis(2-ethylhexyl)phthalate	370U ug/Kg	48 ug/Kg	Not calculable
	Pesticides & PCBs	ND	ND	-
WF015	**Client ID**	**COS00101**	**COS00101D**	
	Laboratory ID	**RA908004**	**RA908005**	
	Collection Date	**1/18/96**	**1/18/96**	
	Acetone	22 ug/Kg	12U ug/Kg	Not calculable
	Semivolatiles	ND	ND	-
	Pesticides & PCBs	ND	ND	-

Tab.

Summary of Surrogate Recoveries
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF006	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
	All samples	Pesticides & PCBs	All within QC limits	-	-	None
WF007	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
		Pesticides & PCBs				
	10R00101	Decachlorobiphenyl	54	60-150	1	UJ (all compounds)
WF008	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
		Pesticides & PCBs				
	15S02501	Decachlorobiphenyl	54	60-150	1	UJ (all compounds)
WF009	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
	All samples	Pesticides & PCBs	All within QC limits	-	-	None
WF010	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
		Pesticides & PCBs				
	31S00101	Tetrachloro-m-xylene	57	60-150	1	UJ/J (all compounds)
		Tetrachloro-m-xylene	56	60-150		

Table VI
Summary of Surrogate Recoveries
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF11A	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
		Pesticides & PCBs				
	09W00101	Decachlorobiphenyl	56	60-150	3	UJ (all compounds)
		Decachlorobiphenyl	50	60-150		
	09W00101D	Decachlorobiphenyl	58	60-150		UJ (all compounds)
		Decachlorobiphenyl	51	60-150		
	16W00101	Decachlorobiphenyl	45	60-150		UJ (all compounds)
		Decachlorobiphenyl	40	60-150		
WF11B	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
		Pesticides & PCBs				
	12R00101	Decachlorobiphenyl	33	60-150	4	UJ (all compounds)
		Decachlorobiphenyl	29	60-150		
	10S00201	Decachlorobiphenyl	56	60-150		UJ/J (all compounds)
		Decachlorobiphenyl	55	60-150		
	10S00301	Decachlorobiphenyl	45	60-150		UJ/J (all compounds)
		Decachlorobiphenyl	42	60-150		
	11S00201	Decachlorobiphenyl	50	60-150		UJ/J (all compounds)
WF012	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
		Pesticides & PCBs	54	60-150	4	UJ (all compounds)
	31R00201	Decachlorobiphenyl	43	60-150		
	31S00901	Decachlorobiphenyl	45	60-150		UJ/J (all compounds)
		Decachlorobiphenyl	40	60-150		
	31S01201	Decachlorobiphenyl	48	60-150		UJ/J (all compounds)
		Decachlorobiphenyl	50	60-150		
	31S01301	Decachlorobiphenyl	46	60-150		UJ (all compounds)

Tab.
Summary of Surrogate Recoveries
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF013	All samples	Volatiles	All within QC limits	-	-	None
		Semivolatiles				
	16S00801	Nitrobenzene-d5	3	23-120	1	R
		2-Fluorobiphenyl	3	30-115		
		Terphenyl-d14	4	18-137		
		Phenol-d5	2	24-113		
		2-Fluorophenol	2	25-121		
		2,4,6-Tribromophenol	3	19-122		
		2-Chlorophenol-d4	3	20-130		
		1,2-Dichlorobenzene-d4	2	20-130		
		Pesticides & PCBs				
	16R00101	Decachlorobiphenyl	58	60-150	8	UJ (all compounds)
	16S00101D	Tetrachloro-m-xylene	22	60-150		UJ/J (all compounds)
		Tetrachloro-m-xylene	21	60-150		
	16S00301	Tetrachloro-m-xylene	57	60-150		UJ/J (all compounds)
		Decachlorobiphenyl	57	60-150		
		Decachlorobiphenyl	54	60-150		
	16S01001	Decachlorobiphenyl	44	60-150		UJ/J (all compounds)
		Decachlorobiphenyl	41	60-150		
	16S01201	Tetrachloro-m-xylene	55	60-150		UJ/J (all compounds)
	16S01301	Decachlorobiphenyl	55	60-150		UJ/J (all compounds)
		Decachlorobiphenyl	55	60-150		
	24S00101	Tetrachloro-m-xylene	48	60-150		UJ (all compounds)
		Tetrachloro-m-xylene	46	60-150		
		Decachlorobiphenyl	41	60-150		
		Decachlorobiphenyl	43	60-150		
	BKS00101	Tetrachloro-m-xylene	56	60-150		UJ (all compounds)
WF014	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
		Pesticides & PCBs				
	BKR00101	Decachlorobiphenyl	43	60-150	1	UJ (all compounds)
		Decachlorobiphenyl	39	60-150		

Table VI
Summary of Surrogate Recoveries
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF015	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
		Pesticides & PCBs				
	COR00101	Decachlorobiphenyl	55	60-150	5	UJ (all compounds)
	AOS00101	Tetrachloro-m-xylene	55	60-150		UJ/J (all compounds)
		Decachlorobiphenyl	51	60-150		
		Decachlorobiphenyl	48	60-150		UJ (all compounds
	COS00101D	Tetrachloro-m-xylene	26	60-150		
		Tetrachloro-m-xylene	24	60-150		UJ/J (all compounds)
	WOS00101	Tetrachloro-m-xylene	39	60-150		
		Tetrachloro-m-xylene	37	60-150		
		Decachlorobiphenyl	41	60-150		
		Decachlorobiphenyl	43	60-150		
	YOS00101	Tetrachloro-m-xylene	37	60-150		UJ (all compounds)
		Tetrachloro-m-xylene	36	60-150		
	COS00101	Tetrachloro-m-xylene	7	60-150	2	R (ND compounds)
		Tetrachloro-m-xylene	7	60-150		
	SOS00101	Tetrachloro-m-xylene	2	60-150		R (ND compounds)
		Tetrachloro-m-xylene	1	60-150		
		Decachlorobiphenyl	15	60-150		
		Decachlorobiphenyl	16	60-150		

Notes: J = estimated value
UJ = undetected, but number that is reported as the quantification limit is an estimated value.

Table VII
Summary of Compounds Exceeding Instrument Calibration
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Criteria		Qualifier
			Initial Calibration %RSD	Continuing Calibration %D	
WF006	All	Volatiles	-	-	None
	12/7/96	2,4-Dinitrophenol	-	33.1	UJ
	12/8/96	2,4-Dinitrophenol	-	27.0	UJ
	12/11/96	Diethylphthalate	-	30.1	UJ
	12/12/96	Diethylphthalate	-	27.1	UJ
	11/30/95	Alpha-BHC	21.7	-	UJ
	11/30/95	Alpha-BHC	20.3	-	UJ
WF007	All	Volatiles	-	-	None
	12/12/96	Dimethylphthalate	-	27.1	UJ
	12/15/96	Nitrobenzene	-	25.6	UJ
		Pentachlorophenol	-	29.6	UJ
	12/15/96	Nitrobenzene	-	30.8	UJ
		2,4-Dinitrophenol	-	41.8	UJ
		4,6-Dinitro-2-methylphenol	-	30.1	UJ
		Pentachlorophenol	-	29.8	UJ
		Benzo(k)fluoranthene	-	26.5	UJ/J
	All	Pesticides & PCBs	-	-	None
WF008	All	Volatiles	-	-	None
	12/15/95	Nitrobenzene	-	25.6	UJ
		Pentachlorophenol	-	29.6	UJ
	12/31/95	2,4-Dinitrophenol	-	42.0	UJ
		4-Nitrophenol	-	27.3	UJ
		Pentachlorophenol	-	34.8	UJ
		3,3'-Dichlorobenzidine	-	25.9	UJ
		Benzo(b)fluoranthene	-	27.7	UJ
	11/30/95	Alpha-BHC	21.7	-	UJ
	11/30/95	Alpha-BHC	20.3	-	UJ
WF009	All	Volatiles	-	-	None
	12/15/95	Nitrobenzene	-	25.6	UJ
		Pentachlorophenol	-	29.6	UJ
	12/31/95	2,4-Dinitrophenol	-	42.0	UJ
		4-Nitrophenol	-	27.3	UJ
		Pentachlorophenol	-	34.8	UJ
		3,3'-Dichlorobenzidine	-	25.9	UJ
		Benzo(b)fluoranthene	-	27.7	UJ
	All	Pesticides & PCBs	-	-	None

Table VII
Summary of Compounds Exceeding Instrument Calibration
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Criteria		Qualifier
			Initial Calibration %RSD	Continuing Calibration %D	
WF010	All	Volatiles	-	-	None
	12/27/95	4-Nitrophenol	-	28.1	UJ
		Benzo(b)fluoranthene	-	31.4	UJ
		Indeno(1,2,3-cd)pyrene	-	32.8	UJ
	11/30/95	Alpha-BHC	21.7	-	UJ
	11/30/95	Alpha-BHC	20.3	-	UJ
WF11A	All	Volatiles	-	-	None
	All	Semivolatiles	-	-	None
	1/10/96	Endosulfan I	22	-	UJ
WF11B	1/10/96	Acetone	-	40.0	UJ/J
		2-Butanone	-	37.3	UJ
		4-Methyl-2-pentanone	-	37.7	UJ
		2-Hexanone	-	41.0	UJ/J
	1/11/96	Trichloroethene	-	27.7	UJ
		2-Hexanone	-	50.9	UJ/J
		1,1,2,2-Tetrachloroethane	-	34.2	UJ
	1/12/96	2-Hexanone	-	48.4	UJ/J
	1/10/96	Endosulfan I	22	-	UJ
WF012	1/11/96	Trichloroethene	-	27.7	UJ
		2-Hexanone	-	50.9	UJ
		1,1,2,2-Tetrachloroethane	-	34.2	UJ
	1/12/96	2-Hexanone	-	48.4	UJ
	1/13/96	Chloromethane	-	27.2	UJ
		Vinyl chloride	-	27.2	UJ
		Acetone	-	68.1	UJ/J
		2-Butanone	-	69.9	UJ
		1,2-Dichloroethane	-	29.6	UJ
		4-Methyl-2-pentanone	-	31.4	UJ
	1/15/96	Chloroethane	-	26.3	UJ
		Acetone	-	51.7	UJ/J
		2-Butanone	-	40.8	UJ
		1,2-Dichloroethane	-	35.4	UJ
	All	Semivolatiles	-	-	None
	1/17/96	Endosulfan sulfate	24.0	-	UJ

Table VII
Summary of Compounds Exceeding Instrument Calibration
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Criteria		Qualifier
			Initial Calibration %RSD	Continuing Calibration %D	
WF013	1/15/96	1,1-Dichloroethene	33.9	-	UJ
		Carbon disulfide	32.8	-	UJ
	1/17/96	2-Hexanone	41.7	-	UJ
	1/13/96	Chloromethane	-	27.2	UJ
		Vinyl chloride	-	27.2	UJ
		Acetone	-	68.1	UJ/J
		2-Butanone	-	69.9	UJ
		1,2-Dichloroethane	-	29.6	UJ
		4-Methyl-2-pentanone	-	31.4	UJ
	1/15/96	Chloroethane	-	26.3	UJ
		Acetone	-	51.7	UJ/J
		2-Butanone	-	40.8	UJ
		1,2-Dichloroethane	-	35.4	UJ
	1/18/96	2-Hexanone	-	27.5	UJ
	1/22/96	Chloromethane	-	41.8	UJ
		Vinyl chloride	-	37.1	UJ
		Chloroethane	-	41.7	UJ
		Acetone	-	31.7	UJ/J
		Carbon disulfide	-	25.8	UJ
		2-Hexanone	-	38.4	UJ
	1/19/96	Benzo(g,h,i)perylene	-	29.0	UJ/J
	1/17/96	Endosulfan sulfate	24.0	-	UJ
WF014	1/15/96	1,1-Dichloroethene	33.9	-	UJ
		Carbon disulfide	32.8	-	UJ
	1/14/96	Acetone	31.3	-	UJ/J
	1/16/96	Acetone	-	46.7	UJ/J
		Methylene chloride	-	32.3	UJ
		2-Butanone	-	54.2	UJ
		4-Methyl-2-pentanone	-	31.9	UJ
		2-Hexanone	-	60.0	UJ
	1/12/96	Acetone	-	36.7	UJ/J
	1/20/96	Benzo(k)fluoranthene	-	30.7	UJ/J
	1/31/96	4-Nitrophenol	-	38.2	UJ
		4-Nitroaniline	-	27.9	UJ
		Pentachlorophenol	-	29.4	UJ
		Benzo(g,h,i)perylene	-	35.3	UJ/J
	1/17/96	Endosulfan sulfate	24.0	-	UJ

Table VII
Summary of Compounds Exceeding Instrument Calibration
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Criteria		Qualifier
			Initial Calibration %RSD	Continuing Calibration %D	
WF015	1/17/96	2-Hexanone	41.7	-	UJ
	1/19/96	Chloromethane	-	47.1	UJ
		Vinyl chloride	-	39.0	UJ
		Chloroethane	-	54.7	UJ
		Acetone	-	25.8	UJ/J
		Carbon disulfide	-	45.5	UJ
	1/31/96	4-Nitroaniline	-	27.9	UJ
		Pentachlorophenol	-	29.4	UJ
		Benzo(g,h,i)perylene	-	35.3	UJ
	2/2/96	2-Chlorophenol	-	26.6	UJ
		2-Nitroaniline	-	25.1	UJ
		2,4-Dinitrophenol	-	25.7	UJ
		4-Bromophenyl-phenylether	-	27.2	UJ
		Hexachlorobenzene	-	35.4	UJ
	2/1/96	4-Bromophenyl-phenylether	-	28.4	UJ
		Hexachlorobenzene	-	35.0	UJ
	1/30/96	Endosulfan sulfate	21.0	-	UJ

Notes: %RSD = percent Relative Standard Deviation for initial calibrations

%D = percent Difference for continuing calibrations

J = the compound was positively identified; the associated numerical value is the approximate concentration of the compound in the sample, either because its concentration was lower than the QL (laboratory "J" flag), or because QC criteria were not met (validation "J").

UJ = the compound was not detected above the reported sample QL. However, the reported sample QL is approximate; the compound concentration may not reliably be presumed to be less than the QL value.

R = the sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the compound cannot be verified.

Table VIII
Summary of Method Blank Contamination
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Compound	Concentration	Associated Samples
WF006	Volatiles	ND	All samples in SDG WF006
	Pesticides & PCBs	ND	All samples in SDG WF006
	Diethylphthalate	4 ug/L	01R00101 01F00101
	Diethylphthalate	150 ug/Kg	02S00101 02S00201 02S00301 02S00501 09S00101 09S00201 09S00401 09S00501
WF007	Volatiles	ND	All samples in SDG WF007
	Pesticides & PCBs	ND	All samples in SDG WF007
	Diethylphthalate	2 ug/L	10R00101
	Di-n-octylphthalate	230 ug/Kg	13S00101 13S00301 13S00401 13S00501 14S00101D 14S00301
	Di-n-octylphthalate	180 ug/Kg	13S00201 14S00101
WF008	Volatiles	ND	All samples in SDG WF008
	Pesticides & PCBs	ND	All samples in SDG WF008
	Di-n-butylphthalate	280 ug/Kg	15S02001D 15S02101 15S02201 15S01701 15S01701D
WF009	Volatiles	ND	All samples in SDG WF009
	Semivolatiles	ND	All samples in SDG WF009
	Pesticides & PCBs	ND	All samples in SDG WF009
WF010	Volatiles	ND	All samples in SDG WF010
	Di-n-butylphthalate	320 ug/Kg	31S00101 31S00201 31S00301 31S01401 31S01501 31S01501D 31S01601 31S01701 31S01801 31S01901
	Pesticides & PCBs	ND	All samples in SDG WF010

Table VIII
Summary of Method Blank Contamination
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Compound	Concentration	Associated Samples
WF11A	Volatiles	ND	All samples in SDG WF11A
	Bis(2-ethylhexyl)phthalate	3 ug/L	09W00101 09W00101D 16W00101
	Pesticides & PCBs	ND	All samples in SDG WF11A
WF11B	Styrene Xylenes (total)	1 ug/L 2 ug/L	11T00101
	Acetone	7 ug/Kg	10S00301 10S00501 11S00101 11S00201 12S00201 12S00401 12S00501
	Acetone	4 ug/Kg	11S00201R 11S00301 11S00401 11S00501
	Bis(2-ethylhexyl)phthalate	3 ug/L	12R00101
	Di-n-butylphthalate Bis(2-ethylhexyl)phthalate	69 ug/Kg 37 ug/Kg	10S00301 10S00501 12S00201
	Di-n-butylphthalate	100 ug/Kg	10S00201 10S00201DL 10S00201D 10S00301R 12S00401 12S00501 11S00101
	Pesticides & PCBs	ND	All samples in SDG WF11B
WF012	Xylenes (total) Styrene	2 ug/L 1 ug/L	31R00201
	Acetone	7 ug/Kg	31S00801 31S01201
	Acetone	4 ug/Kg	31S00401 31S00501 31S00501D 31S01201R
	Semivolatiles Pesticides & PCBs	ND ND	All samples in SDG WF12 All samples in SDG WF12
WF013	Xylenes (total) Styrene	2 ug/L 1 ug/L	16T00101 16R00101 24T00101

Table VIII
Summary of Method Blank Contamination
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Compound	Concentration	Associated Samples
WF013	Bis(2-ethylhexyl)phthalate	34 ug/Kg	16S00101 16S00501 16S00401 16S00901
	Bis(2-ethylhexyl)phthalate	46 ug/Kg	16S00901R 16S00201
	Bis(2-ethylhexyl)phthalate	76 ug/Kg	16S00301 16S00801 16S00601 16S00601DL 16S01201 16S01301 BKS00301 16S01001
	Pesticides & PCBs	ND	All samples in SDG WF13
WF014	Toluene	1 ug/Kg	31B00301
	Bis(2-ethylhexyl)phthalate	38 ug/Kg	31B00501
	Pesticides & PCBs	ND	All samples in SDG WF14
WF015	Volatiles	ND	All samples in SDG WF15
	Pesticides & PCBs	ND	All samples in SDG WF15
	Bis(2-ethylhexyl)phthalate	1 ug/L	COR00101 COF00101

Table IX
Summary of Field Blank Contamination

Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF006	**Client ID:** 01T00101 **Laboratory ID:** G8864001 **Collection Date:** 12/5/95 **Type:** Trip Blank		
	Acetone	9 ug/L	None
WF006	**Client ID:** 02T00101 **Laboratory ID:** G8876001 **Collection Date:** 12/6/95 **Type:** Trip Blank		
	Acetone	7 ug/L	None
WF006	**Client ID:** 01R00101 **Laboratory ID:** G8876012 **Collection Date:** 12/6/95 **Type:** Rinsate		
	Acetone	11 ug/L	None
	Di-n-butylphthalate	8 ug/L	None
	Bis(2-ethyhexyl)phthalate	2 ug/L	None
	Pesticides & PCBs	ND	None
WF006	**Client ID:** 01F00101 **Laboratory ID:** G8776013 **Collection Date:** 12/6/95 **Type:** Source Blank		
	Acetone	12 ug/L	None
	2-Butanone	2 ug/L	None
	Di-n-butylphthalate	15 ug/L	None
	Pesticides & PCBs	ND	None
WF007	**Client ID:** 10T00101 **Laboratory ID:** G8889001 **Collection Date:** 12/7/95 **Type:** Trip Blank		
	Acetone	8 ug/L	None
WF007	**Client ID:** 13T00101 **Laboratory ID:** G8895001 **Collection Date:** 12/8/95 **Type:** Trip Blank		
	Acetone	4 ug/L	None
WF007	**Client ID:** 10R00101 **Laboratory ID:** G8889009 **Collection Date:** 12/7/95 **Type:** Rinsate		
	Volatiles	ND	None
	Di-n-butylphthalate	15 ug/L	10U ug/L[1]
	Pesticides & PCBs	ND	None

Table IX
Summary of Field Blank Contamination

Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF008	**Client ID:** 15T00101 **Laboratory ID:** G8913001 **Collection Date:** 12/9/95 **Type:** Trip Blank		
	Acetone	8 ug/L	None
WF008	**Client ID:** 15R00101 **Laboratory ID:** G8913020 **Collection Date:** 12/11/95 **Type:** Rinsate		
	Volatiles	ND	None
	Di-n-butylphthalate	3 ug/L	10U ug/L[1]
	Pesticides & PCBs	ND	None
WF009	**Client ID:** 15T00201 **Laboratory ID:** G8914001 **Collection Date:** 12/11/95 **Trip Blank:** Trip Blank		
	Acetone	19 ug/L	None
WF009	**Client ID:** 15R00201 **Laboratory ID:** G8914012 **Collection Date:** 12/11/95 **Type:** Rinsate		
	Acetone	12 ug/L	None
	Di-n-butylphthalate	4 ug/L	10U ug/L[1]
	Pesticides & PCBs	ND	None
WF010	**Client ID:** 31T00101 **Laboratory ID:** G8924005 **Collection Date:** 12/12/95 **Type:** Trip Blank		
	Acetone	10 ug/L	None
WF010	**Client ID:** 31T00201 **Laboratory ID:** G8938001 **Collection Date:** 12/13/95 **Type:** Trip Blank		
	Acetone	12 ug/L	None
WF010	**Client ID:** 31R00101 **Laboratory ID:** G8924006 **Collection Date:** 12/12/965 **Type:** Rinsate		
	Volatiles	ND	None
	Di-n-butylphthalate	7 ug/L	10U ug/L[1]
	Pesticides & PCBs	ND	None

Table IX
Summary of Field Blank Contamination

Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF11B	**Client ID:** 12R00101 **Laboratory ID:** RA847012 **Collection Date:** 1/5/96 **Type:** Rinsate		
	Volatiles	ND	None
	Di-n-butylphthalate	4 ug/L	None
	Pesticides &PCBs	ND	None
WF11B	**Client ID:** 12T00101 **Laboratory ID:** RA847001 **Collection Date:** 1/5/96 **Type:** Trip Blank		
	Volatiles	ND	None
WF11B	**Client ID:** 11T00101 **Laboratory ID:** RA847013 **Collection Date:** 1/6/96 **Type:** Trip Blank		
	Volatiles	ND	None
WF012	**Client ID:** 31R00201 **Laboratory ID:** RA855021 **Collection Date:** 1/8/96 **Type:** Rinsate		
	Volatiles	ND	None
	Semivolatiles	ND	None
	Pesticides & PCBs	ND	None
WF013	**Client ID:** 16T00101 **Laboratory ID:** RA856016 **Collection Date:** 1/9/96 **Type:** Trip Blank		
	Volatiles	ND	None
WF013	**Client ID:** 24T00101 **Laboratory ID:** RA871001 **Collection Date:** 1/10/96 **Type:** Trip Blank		
	Volatiles	ND	None
WF013	**Client ID:** 16R00101 **Laboratory ID:** RA856017 **Collection Date:** 1/9/96 **Type:** Rinsate		
	Volatiles	ND	None
	Di-n-butylphthalate	5 ug/L	10U ug/L[1]
	Pesticides & PCBs	ND	None

Table IX
Summary of Field Blank Contamination

Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF014	**Client ID:** BKT00101 **Laboratory ID:** RA870002 **Collection Date:** 1/10/96 **Type:** Trip Blank		
	Volatiles	ND	None
WF014	**Client ID:** 31T00201 **Laboratory ID:** RA870018 **Collection Date:** 1/11/96 **Type:** Trip Blank		
	Volatiles	ND	None
WF014	**Client ID:** BKR00101 **Laboratory ID:** RA870001 **Collection Date:** 1/10/96 **Type:** Rinsate		
	Volatiles	ND	None
	Di-n-butylphthalate	5 ug/L	10U ug/L[1]
	Pesticides & PCBs	ND	None
WF015	**Client ID:** COT00101 **Laboratory ID:** RA908003 **Collection Date:** 1/18/96 **Type:** Trip Blank		
	Volatiles	ND	None
WF015	**Client ID:** COR00101 **Laboratory ID:** RA908001 **Collection Date:** 1/18/96 **Type:** Rinsate		
	Volatiles	ND	None
	Di-n-butylphthalate	5 ug/L	10U ug/L[1]
	Pesticides & PCBs	ND	None
WF015	**Client ID:** COF00101 **Laboratory ID:** RA908002 **Collection Date:** 1/18/96 **Type:** Source Blank		
	Volatiles	ND	None
	Di-n-butylphthalate	7 ug/L	None
	Pesticides & PCBs	ND	None

[1] = sample result was modified based on an associated method blank concentration.

Note: see detailed data validation report for the discrete qualifiers.

Table X
Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike and Laboratory Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Client ID	Analyte	Criteria		% Recovery		RPD	Qualifier
			% Recovery	RPD	MS	MSD		
WF006	02S00401	Calcium	-	±2205 mg/Kg	-	-	9780 mg/Kg	J
		Nickel	-	±17.6 mg/Kg	-	-	40.8 mg/Kg	J
		Antimony	75-125	-	73.8	-	-	J
		Manganese	75-125	-	73.8	-	-	J
		Cyanide	-	-	-	-	-	None
		TRPH	-	-	-	-	-	None
WF007	10S00101	Antimony	75-125	-	65.6	-	-	J
		Barium	75-125	±88.10 mg/Kg	171.0	-	1221 mg/Kg	J
		Manganese	75-125	±6.6 mg/Kg	130.0	-	34.30 mg/Kg	J
		Lead	75-125	-	128.7	-	-	J
		Selenium	75-125	-	56.1	-	-	J
		Cyanide	-	-	-	-	-	None
		TRPH	-	-	-	-	-	None
WF008	15S02001	Antimony	75-125	-	68.2	-	-	J
		Mercury	75-125	-	125.3	-	-	J
		Cyanide	-	-	-	-	-	None
WF009	15S00101	Antimony	75-125	-	53.5	-	-	J
WF010	31S01501	Antimony	75-125	-	73.8	-	-	None
		Cyanide	-	-	-	-	-	None
WF11A	09W00101	All metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
		TRPH	-	-	-	-	-	None
WF11B	10S00201	All metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
		TRPH	-	-	-	-	-	None

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Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike and Laboratory Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Client ID	Analyte	Criteria		% Recovery		RPD	Qualifier
			% Recovery	RPD	MS	MSD		
WF012	31S00501	All metals	-	-	-	-	-	None
		All TCLP metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF013	16S01001	Aluminum	-	≤35	-	-	71.0	J
		Iron	-	≤35	-	-	42.3	J
		Lead	75-125	-	127	-	-	J
		Cyanide	-	-	-	-	-	None
WF014	BKS00201	Aluminum	-	≤35	-	-	35.6	J
		Cyanide	-	-	-	-	-	None
WF015	COS00101	Lead	75-125	-	-46.5	-	-	J
		Cyanide	-	-	-	-	-	None

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF006	**Client ID**	**02S00401**	**02S00401D**	
	Laboratory ID	**G8864007**	**G8864008**	
	Collection Date	**12/5/95**	**12/5/95**	
	Aluminum	9580 mg/Kg	7580 mg/Kg	23
	Arsenic	3.9 mg/Kg	4.0 mg/Kg	3
	Barium	27.7 mg/Kg	15.9 mg/Kg	54
	Beryllium	0.31 mg/Kg	0.13 mg/Kg	81
	Calcium	14900 mg/Kg	9900 mg/Kg	40
	Chromium	13.6 mg/Kg	14.0 mg/Kg	3
	Cobalt	0.53 mg/Kg	ND	Not calculable
	Copper	4.3 mg/Kg	3.8 mg/Kg	12
	Iron	4010 mg/Kg	3880 mg/Kg	3
	Lead	10.9 mg/Kg	11.6 mg/Kg	6
	Magnesium	926 mg/Kg	403 mg/Kg	79
	Manganese	188 mg/Kg	164 mg/Kg	14
	Mercury	0.03 mg/Kg	0.05 mg/Kg	50
	Nickel	3.9 mg/Kg	3.8 mg/Kg	1
	Potassium	377 mg/Kg	142 mg/Kg	91
	Sodium	104 mg/Kg	70.2 mg/Kg	38
	Vanadium	12.9 mg/Kg	11.7 mg/Kg	10
	Zinc	13.1 mg/Kg	12.5 mg/Kg	5
	Cyanide	0.15 mg/Kg	ND	Not calculable
WF006	**Client ID**	**09S00301**	**09S00301D**	
	Laboratory ID	**G8876010**	**G8876011**	
	Collection Date	**12/6/96**	**12/6/96**	
	Aluminum	25200 mg/Kg	33100 mg/Kg	27
	Arsenic	8.5 mg/Kg	7.1 mg/Kg	18
	Barium	8.9 mg/Kg	21.7 mg/Kg	83
	Beryllium	0.12 mg/Kg	0.22 mg/Kg	59
	Calcium	176 mg/Kg	384 mg/Kg	74
	Chromium	21.7 mg/Kg	29.5 mg/Kg	30
	Cobalt	0.52 mg/Kg	0.55 mg/Kg	6
	Copper	6.8 mg/Kg	9.0 mg/Kg	28
	Iron	17800 mg/Kg	26500 mg/Kg	40
	Lead	11.2 mg/Kg	6.6 mg/Kg	52
	Magnesium	143 mg/Kg	227 mg/Kg	45
	Manganese	28.2 mg/Kg	52.9 mg/Kg	61
	Mercury	0.01 mg/Kg	0.01 mg/Kg	0
	Nickel	ND	6.1 mg/Kg	Not calculable
	Potassium	ND	212 mg/Kg	Not calculable
	Selenium	0.33 mg/Kg	ND	Not calculable
	Sodium	8.4 mg/Kg	10.4 mg/Kg	21
	Vanadium	43.5 mg/Kg	65.1 mg/Kg	40
	Zinc	6.3 mg/Kg	14.4 mg/Kg	78
	Cyanide	ND	ND	-
	TRPH	ND	ND	-

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF007	**Client ID**	**10S00101**	**10S00101D**	
	Laboratory ID	**G8889002**	**G8889003**	
	Collection Date	**12/7/95**	**12/7/95**	
	Aluminum	8760 mg/Kg	8920 mg/Kg	2
	Arsenic	2.5 mg/Kg	2.6 mg/Kg	4
	Barium	361 mg/Kg	1320 mg/Kg	114
	Beryllium	0.13 mg/Kg	0.13 mg/Kg	0
	Cadmium	0.91 mg/Kg	ND	Not calculable
	Calcium	23200 mg/Kg	17800 mg/Kg	26
	Chromium	18.2 mg/Kg	16.8 mg/Kg	8
	Cobalt	0.83 mg/Kg	2.0 mg/Kg	82
	Copper	7.9 mg/Kg	7.9 mg/Kg	0
	Iron	6520 mg/Kg	6780 mg/Kg	4
	Lead	38.0 mg/Kg	33.1 mg/Kg	14
	Magnesium	5910 mg/Kg	5600 mg/Kg	5
	Manganese	56.6 mg/Kg	66.0 mg/Kg	15
	Mercury	0.07 mg/Kg	0.07 mg/Kg	0
	Nickel	6.8 mg/Kg	3.0 mg/Kg	77
	Potassium	219 mg/Kg	ND	Not calculable
	Sodium	35.6 mg/Kg	46.2 mg/Kg	26
	Vanadium	18.9 mg/Kg	18.7 mg/Kg	1
	Zinc	37.7 mg/Kg	34.1 mg/Kg	5
	Cyanide	0.10 mg/Kg	0.20 mg/Kg	67
	TRPH	240 mg/Kg	180 mg/Kg	29
WF007	**Client ID**	**14S00101**	**14S00101D**	
	Laboratory ID	**G8895007**	**G8895008**	
	Collection Date	**12/8/95**	**12/8/95**	
	Aluminum	11600 mg/Kg	11500 mg/Kg	1
	Arsenic	1.5 mg/Kg	1.9 mg/Kg	23
	Barium	23.3 mg/Kg	26.6 mg/Kg	13
	Beryllium	0.15 mg/Kg	0.16 mg/Kg	6
	Calcium	120 mg/Kg	183 mg/Kg	6
	Chromium	7.8 mg/Kg	7.8 mg/Kg	0
	Cobalt	1.8 mg/Kg	1.6 mg/Kg	12
	Copper	3.8 mg/Kg	4.3 mg/Kg	12
	Iron	6310 mg/Kg	6630 mg/Kg	5
	Lead	7.7 mg/Kg	11.9 mg/Kg	42
	Magnesium	177 mg/Kg	162 mg/Kg	9
	Manganese	521 mg/Kg	597 mg/Kg	14
	Mercury	0.04 mg/Kg	0.04 mg/Kg	0
	Nickel	4.1 mg/Kg	4.6 mg/Kg	12
	Potassium	144 mg/Kg	ND	Not calculable
	Sodium	16.4 mg/Kg	14.0 mg/Kg	16
	Vanadium	16.8 mg/Kg	17.4 mg/Kg	6
	Zinc	6.0 mg/Kg	6.6 mg/Kg	10
	Cyanide	0.07 mg/Kg	ND	Not calculable

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF008	**Client ID**	**15S02001**	**15S02001D**	
	Laboratory ID	**G8913002**	**G8913003**	
	Collection Date	**12/9/95**	**12/9/95**	
	Aluminum	4630 mg/Kg	5470 mg/Kg	17
	Arsenic	1.2 mg/Kg	1.1 mg/Kg	9
	Barium	5.6 mg/Kg	6.6 mg/Kg	16
	Beryllium	0.13 mg/Kg	0.13 mg/Kg	0
	Calcium	22.2 mg/Kg	25.2 mg/Kg	13
	Chromium	3.0 mg/Kg	3.7 mg/Kg	21
	Copper	1.9 mg/Kg	2.4 mg/Kg	23
	Iron	2500 mg/Kg	2950 mg/Kg	17
	Lead	5.9 mg/Kg	5.9 mg/Kg	0
	Magnesium	85.0 mg/Kg	107 mg/Kg	23
	Manganese	75.2 mg/Kg	87.1 mg/Kg	15
	Mercury	0.02 mg/Kg	0.02 mg/Kg	0
	Nickel	2.4 mg/Kg	9.1 mg/Kg	117
	Selenium	0.26 mg/Kg	ND	Not calculable
	Vanadium	5.7 mg/Kg	7.1 mg/Kg	22
	Zinc	3.0 mg/Kg	4.1 mg/Kg	31
	Cyanide	ND	ND	-
WF008	**Client ID**	**15S01701**	**15S01701D**	
	Laboratory ID	**G8913013**	**G8913014**	
	Collection Date	**12/10/95**	**12/10/95**	
	Aluminum	13700 mg/Kg	9290 mg/Kg	38
	Arsenic	3.7 mg/Kg	4.3 mg/Kg	15
	Barium	4.4 mg/Kg	3.8 mg/Kg	15
	Beryllium	0.11 mg/Kg	0.11 mg/Kg	0
	Calcium	23.7 mg/Kg	20.4 mg/Kg	15
	Chromium	14.8 mg/Kg	14.0 mg/Kg	6
	Copper	2.6 mg/Kg	2.5 mg/Kg	4
	Iron	11900 mg/Kg	10400 mg/Kg	13
	Lead	4.7 mg/Kg	4.1 mg/Kg	14
	Magnesium	51.2 mg/Kg	41.8 mg/Kg	20
	Manganese	10.8 mg/Kg	6.8 mg/Kg	45
	Nickel	ND	3.0 mg/Kg	Not calculable
	Selenium	ND	0.25 mg/Kg	Not calculable
	Vanadium	35.9 mg/Kg	31.8 mg/Kg	12
	Zinc	1.5 mg/Kg	1.1 mg/Kg	31
	Cyanide	ND	ND	-

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF009	**Client ID**	**15S00101**	**15S00101D**	
	Laboratory ID	**G8914002**	**G8914003**	
	Collection Date	**12/11/95**	**12/11/95**	
	Aluminum	9280 mg/Kg	10800 mg/Kg	15
	Arsenic	2.0 mg/Kg	1.9 mg/Kg	5
	Barium	6.6 mg/Kg	7.8 mg/Kg	17
	Beryllium	0.12 mg/Kg	0.13 mg/Kg	8
	Calcium	21.6 mg/Kg	23.9 mg/Kg	10
	Chromium	8.4 mg/Kg	8.0 mg/Kg	5
	Copper	3.4 mg/Kg	3.9 mg/Kg	14
	Iron	5120 mg/Kg	5700 mg/Kg	11
	Lead	4.7 mg/Kg	3.6 mg/Kg	26
	Magnesium	109 mg/Kg	132 mg/Kg	19
	Manganese	36.4 mg/Kg	39.9 mg/Kg	9
	Mercury	0.02 mg/Kg	0.02 mg/Kg	0
	Nickel	5.0 mg/Kg	2.4 mg/Kg	70
	Potassium	169 mg/Kg	ND	Not calculable
	Vanadium	13.3 mg/Kg	15.1 mg/Kg	13
	Zinc	4.1 mg/Kg	5.0 mg/Kg	22
	Cyanide	ND	ND	-
WF010	**Client ID**	**31S01501**	**31S01501D**	
	Laboratory ID	**G8938002**	**G8938003**	
	Collection Date	**12/13/95**	**12/13/95**	
	Aluminum	9620 mg/Kg	8270 mg/Kg	15
	Arsenic	1.4 mg/Kg	1.9 mg/Kg	30
	Barium	14.6 mg/Kg	12.2 mg/Kg	18
	Beryllium	0.17 mg/Kg	0.15 mg/Kg	13
	Calcium	112 mg/Kg	103 mg/Kg	8
	Chromium	6.7 mg/Kg	6.0 mg/Kg	11
	Cobalt	0.80 mg/Kg	1.2 mg/Kg	40
	Copper	5.5 mg/Kg	4.2 mg/Kg	27
	Iron	4730 mg/Kg	4380 mg/Kg	8
	Lead	5.3 mg/Kg	5.4 mg/Kg	2
	Magnesium	154 mg/Kg	114 mg/Kg	30
	Manganese	183 mg/Kg	172 mg/Kg	6
	Mercury	0.01 mg/Kg	0.01 mg/Kg	0
	Nickel	3.9 mg/Kg	3.4 mg/Kg	13
	Potassium	ND	197 mg/Kg	Not calculable
	Vanadium	12.8 mg/Kg	11.3 mg/Kg	12
	Zinc	6.8 mg/Kg	5.0 mg/Kg	30
	Cyanide	ND	ND	-
WF11A	**Client ID**	**09W00101**	**09W00101D**	
	Laboratory ID	**RA903001**	**RA903002**	
	Collection Date	**1/5/96**	**1/5/96**	
	Aluminum	123 mg/L	129 mg/L	5
	Arsenic	0.60 mg/L	ND	Not calculable
	Barium	1.1 mg/L	1.3 mg/L	17
	Calcium	760 mg/L	726 mg/L	5
	Iron	118 mg/L	105 mg/L	12
	Magnesium	234 mg/L	236 mg/L	1
	Manganese	12.2 mg/L	12.0 mg/L	2
	Potassium	313 mg/L	298 mg/L	2
	Sodium	904 mg/L	893 mg/L	1
	Zinc	5.4 mg/L	3.8 mg/L	34
	Cyanide	ND	ND	-
	TRPH	ND	ND	-

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF11B	**Client ID**	**10S00201**	**10S00201D**	
	Laboratory ID	**RA847002**	**RA847003**	
	Collection Date	**1/5/96**	**1/5/96**	
	Aluminum	8960 mg/Kg	5890 mg/Kg	41
	Arsenic	3.6 mg/Kg	2.4 mg/Kg	40
	Barium	9.2 mg/Kg	8.1 mg/Kg	13
	Beryllium	0.10 mg/Kg	0.06 mg/Kg	50
	Cadmium	1.4 mg/Kg	1.3 mg/Kg	7
	Calcium	1320 mg/Kg	779 mg/Kg	51
	Chromium	16.0 mg/Kg	12.2 mg/Kg	27
	Cobalt	0.79 mg/Kg	0.82 mg/Kg	4
	Copper	10.8 mg/Kg	11.5 mg/Kg	6
	Iron	9660 mg/Kg	8650 mg/Kg	11
	Lead	32.5 mg/Kg	29.0 mg/Kg	11
	Magnesium	200 mg/Kg	100 mg/Kg	66
	Manganese	39.3 mg/Kg	36.4 mg/Kg	8
	Nickel	2.0 mg/Kg	ND	Not calculable
	Potassium	69.4 mg/Kg	ND	Not calculable
	Sodium	181 mg/Kg	192 mg/Kg	6
	Vanadium	24.5 mg/Kg	20.8 mg/Kg	16
	Zinc	50.0 mg/Kg	42.9 mg/Kg	15
	Cyanide	0.20 mg/Kg	0.13 mg/Kg	42
	TRPH	105 mg/Kg	66.1 mg/Kg	46
WF012	**Client ID**	**31S00501**	**31S00501D**	
	Laboratory ID	**RA855011**	**RA855012**	
	Collection Date	**1/7/96**	**1/7/96**	
	Aluminum	4500 mg/Kg	6050 mg/Kg	29
	Arsenic	1.3 mg/Kg	1.2 mg/Kg	8
	Barium	6.6 mg/Kg	8.6 mg/Kg	26
	Calcium	143 mg/Kg	146 mg/Kg	2
	Chromium	2.8 mg/Kg	3.8 mg/Kg	30
	Cobalt	ND	1.2 mg/Kg	Not calculable
	Copper	2.2 mg/Kg	3.0 mg/Kg	31
	Iron	2470 mg/Kg	2840 mg/Kg	14
	Lead	3.2 mg/Kg	2.9 mg/Kg	10
	Magnesium	80.1 mg/Kg	138 mg/Kg	53
	Manganese	87.0 mg/Kg	95.3 mg/Kg	9
	Nickel	1.9 mg/Kg	2.2 mg/Kg	15
	Potassium	81.9 mg/Kg	115 mg/Kg	34
	Selenium	0.18 mg/Kg	ND	Not calculable
	Sodium	192 mg/Kg	175 mg/Kg	9
	Vanadium	5.9 mg/Kg	7.2 mg/Kg	20
	Zinc	3.9 mg/Kg	5.2 mg/Kg	28
	Barium, TCLP	0.393 mg/L	0.574 mg/L	37
	Chromium, TCLP	0.0017U mg/L	0.0018 mg/L	Not calculable
	Selenium, TCLP	0.0217U mg/L	0.2351 mg/L	Not calculable
	Cyanide	0.09 mg/Kg	ND	Not calculable
WF012	**Client ID**	**11S00601**	**11S00601D**	
	Laboratory ID	**RA855001**	**RA855002**	
	Collection Date	**1/7/96**	**11/7/96**	
	Lead	19.3 mg/Kg	25.0 mg/Kg	26

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF013	**Client ID**	**16S00101**	**16S00101D**	
	Laboratory ID	**RA856001**	**RA856018**	
	Collection Date	**1/8/96**	**1/8/96**	
	Aluminum	4250 mg/Kg	5480 mg/Kg	25
	Arsenic	0.94 mg/Kg	1.2 mg/Kg	24
	Barium	13.2 mg/Kg	13.6 mg/Kg	3
	Beryllium	0.09 mg/Kg	ND	Not calculable
	Cadmium	0.28 mg/Kg	0.30 mg/Kg	7
	Calcium	210 mg/Kg	173 mg/Kg	19
	Chromium	4.0 mg/Kg	5.8 mg/Kg	37
	Copper	4.8 mg/Kg	3.0 mg/Kg	46
	Iron	2340 mg/Kg	2910 mg/Kg	22
	Lead	7.8 mg/Kg	7.5 mg/Kg	4
	Magnesium	103 mg/Kg	150 mg/Kg	37
	Manganese	185 mg/Kg	151 mg/Kg	20
	Nickel	ND	1.9 mg/Kg	Not calculable
	Potassium	99.6 mg/Kg	141 mg/Kg	34
	Selenium	0.19 mg/Kg	ND	Not calculable
	Sodium	129 mg/Kg	108 mg/Kg	18
	Vanadium	6.8 mg/Kg	8.6 mg/Kg	23
	Zinc	6.4 mg/Kg	6.9 mg/Kg	8
	Cyanide	0.12 mg/Kg	0.12 mg/Kg	0
WF013	**Client ID**	**16S01001**	**16S01001D**	
	Laboratory ID	**RA856014**	**RA856015**	
	Collection Date	**1/9/96**	**1/9/96**	
	Aluminum	2000 mg/Kg	1780 mg/Kg	12
	Arsenic	0.76 mg/Kg	0.64 mg/Kg	17
	Barium	4.9 mg/Kg	4.0 mg/Kg	20
	Cadmium	ND	0.23 mg/Kg	Not calculable
	Calcium	101 mg/Kg	99.8 mg/Kg	1
	Chromium	3.9 mg/Kg	3.3 mg/Kg	16
	Copper	10.2 mg/Kg	8.6 mg/Kg	17
	Iron	1470 mg/Kg	1310 mg/Kg	12
	Lead	13.5 mg/Kg	12.4 mg/Kg	9
	Magnesium	38.5 mg/Kg	29.9 mg/Kg	25
	Manganese	5.6 mg/Kg	4.9 mg/Kg	13
	Mercury	0.20 mg/Kg	0.17 mg/Kg	16
	Potassium	ND	77.6 mg/Kg	Not calculable
	Selenium	0.13 mg/Kg	ND	Not calculable
	Silver	4.1 mg/Kg	3.6 mg/Kg	13
	Sodium	139 mg/Kg	118 mg/Kg	16
	Vanadium	3.4 mg/Kg	3.2 mg/Kg	6
	Zinc	4.1 mg/Kg	3.4 mg/Kg	19
	Cyanide	0.10 mg/Kg	0.17 mg/Kg	52

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF014	**Client ID**	**BKS00201**	**BKS00201D**	
	Laboratory ID	**RA870008**	**RA870009**	
	Collection Date	**1/10/96**	**1/10/96**	
	Aluminum	6640 mg/Kg	4230 mg/Kg	44
	Arsenic	1.6 mg/Kg	0.99 mg/Kg	47
	Barium	11.4 mg/Kg	8.9 mg/Kg	34
	Beryllium	0.05 mg/Kg	ND	Not calculable
	Cadmium	0.21 mg/Kg	ND	Not calculable
	Calcium	132 mg/Kg	215 mg/Kg	48
	Chromium	3.4 mg/Kg	2.0 mg/Kg	52
	Cobalt	1.0 mg/Kg	ND	Not calculable
	Copper	3.4 mg/Kg	2.3 mg/Kg	39
	Iron	3340 mg/Kg	2220 mg/Kg	40
	Lead	5.9 mg/Kg	5.1 mg/Kg	15
	Magnesium	124 mg/Kg	72.5 mg/Kg	52
	Manganese	249 mg/Kg	217 mg/Kg	14
	Mercury	0.04 mg/Kg	0.05 mg/Kg	1
	Nickel	2.6 mg/Kg	ND	Not calculable
	Potassium	96.8 mg/Kg	65.8 mg/Kg	38
	Selenium	0.16 mg/Kg	0.14 mg/Kg	13
	Sodium	184 mg/Kg	346 mg/Kg	61
	Thallium	0.16 mg/Kg	ND	Not calculable
	Vanadium	8.1 mg/Kg	5.0 mg/Kg	47
	Zinc	5.6 mg/Kg	3.2 mg/Kg	55
	Cyanide	0.11 mg/Kg	ND	Not calculable
WF014	**Client ID**	**31B00201**	**31B00201D**	
	Laboratory ID	**RA870014**	**RA870015**	
	Collection Date	**1/11/96**	**1/11/96**	
	Aluminum	4360 mg/Kg	4050 mg/Kg	7
	Arsenic	1.0 mg/Kg	1.2 mg/Kg	18
	Barium	4.7 mg/Kg	4.3 mg/Kg	9
	Beryllium	0.05 mg/Kg	ND	Not calculable
	Cadmium	0.21 mg/Kg	0.34 mg/Kg	47
	Calcium	107 mg/Kg	121 mg/Kg	12
	Chromium	2.6 mg/Kg	2.1 mg/Kg	21
	Cobalt	0.76 mg/Kg	ND	Not calculable
	Copper	8.5 mg/Kg	8.4 mg/Kg	1
	Iron	2960 mg/Kg	2750 mg/Kg	7
	Lead	2.9 mg/Kg	2.9 mg/Kg	0
	Magnesium	81.1 mg/Kg	72.0 mg/Kg	12
	Manganese	8.0 mg/Kg	7.5 mg/Kg	7
	Mercury	0.04 mg/Kg	0.04 mg/Kg	0
	Nickel	1.8 mg/Kg	1.6 mg/Kg	12
	Potassium	88.8 mg/Kg	114 mg/Kg	25
	Sodium	175 mg/Kg	183 mg/Kg	5
	Vanadium	6.0 mg/Kg	5.3 mg/Kg	12
	Zinc	7.1 mg/Kg	6.4 mg/Kg	10

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF015	**Client ID**	**COS00101**	**COS00101D**	
	Laboratory ID	**RA908004**	**RA908005**	
	Collection Date	**1/18/96**	**1/18/96**	
	Aluminum	1770 mg/Kg	1620 mg/Kg	9
	Arsenic	0.57 mg/Kg	0.29 mg/Kg	65
	Barium	17.3 mg/Kg	11.6 mg/Kg	39
	Beryllium	0.07 mg/Kg	0.10 mg/Kg	35
	Calcium	521 mg/Kg	200 mg/Kg	89
	Chromium	2.0 mg/Kg	1.5 mg/Kg	29
	Copper	5.1 mg/Kg	5.0 mg/Kg	2
	Iron	906 mg/Kg	919 mg/Kg	1.4
	Lead	19.4 mg/Kg	8.9 mg/Kg	74
	Magnesium	142 mg/Kg	51.4 mg/Kg	94
	Manganese	4.9 mg/Kg	5.6 mg/Kg	13
	Sodium	120 mg/Kg	95.6 mg/Kg	23
	Vanadium	2.6 mg/Kg	2.8 mg/Kg	7
	Zinc	11.5 mg/Kg	3.3 mg/Kg	111
	Cyanide	0.12 mg/Kg	0.20 mg/Kg	50

Table XII
Summary of Analytes Exceeding Instrument Calibration
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Date	Analyte	Criteria		Qualifier
			Initial Calibration r	Continuing Calibration %R	
WF006	All	All metals	-	-	None
	All	Cyanide	-	-	None
	All	TRPH	-	-	None
WF007	All	All metals	-	-	None
	All	Cyanide	-	-	None
	All	TRPH	-	-	None
WF008	All	All metals	-	-	None
	All	Cyanide	-	-	None
WF009	All	All metals	-	-	None
	All	Cyanide	-	-	None
WF010	All	All metals	-	-	None
	All	Cyanide	-	-	None
WF11A	All	All metals	-	-	None
	All	Cyanide	-	-	None
	All	TRPH	-	-	None
WF11B	All	All metals	-	-	None
	All	Cyanide	-	-	None
	All	TRPH	-	-	None
WF012	All	All metals	-	-	None
	All	All TCLP metals	-	-	None
	All	Cyanide	-	-	None
WF013	All	All metals	-	-	None
	All	Cyanide	-	-	None
WF014	All	All metals	-	-	None
	All	Cyanide	-	-	None
WF015	All	All metals	-	-	None
	All	Cyanide	-	-	None

Notes: r = correlation coefficient for initial calibrations

%R = percent recovery for continuing calibrations

J = the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample because QC criteria were not met (validation "J").

UJ = the analyte was not detected above the reported sample IDL. However, the reported sample is approximate; the analyte concentration may not reliably be presumed to be less than the IDL value.

R = the sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Table XIII
Summary of Method Blank Contamination
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF006	Aluminum	-5.056 mg/Kg	All soil samples in SDG WF006
	Calcium	-5.002 mg/Kg	
	Copper	0.482 mg/Kg	
	Iron	-1.408 mg/Kg	
	Magnesium	-5.504 mg/Kg	
	Selenium	0.660 mg/Kg	
	Sodium	2.840 mg/Kg	
	Zinc	0.344 mg/Kg	
	Aluminum	-7.772 mg/Kg	All soil samples in SDG WF006
	Cobalt	-0.518 mg/Kg	
	Iron	-1.702 mg/Kg	
	Magnesium	-5.232 mg/Kg	
	Copper	2.690 ug/L	All water samples in SDG WF006
	Iron	-5.220 ug/L	
	Magnesium	-37.720 ug/L	
	Mercury	-0.029 ug/L	
	Selenium	2.300 ug/L	
	Sodium	51.840 ug/L	
	Cyanide	ND	All samples in SDG WF006
	TRPH	ND	All samples in SDG WF006
WF007	Barium	0.174 mg/Kg	All soil samples in SDG WF007
	Calcium	6.280 mg/Kg	
	Iron	1.776 mg/Kg	
	Sodium	6.856 mg/Kg	
	Aluminum	47.800 ug/L	All water samples in SDG WF007
	Beryllium	0.250 ug/L	
	Calcium	38.580 ug/L	
	Cobalt	-2.750 ug/L	
	Copper	6.560 ug/L	
	Iron	15.910 ug/L	
	Nickel	12.410 ug/L	
	Sodium	-320.390 ug/L	
	Zinc	2.210 ug/L	
	Cyanide	ND	All samples in SDG WF007
	TRPH	ND	All samples in SDG WF007
WF008	Aluminum	10.014 mg/Kg	All soil samples in SDG WF008
	Beryllium	0.068 mg/Kg	
	Copper	0.454 mg/Kg	
	Iron	3.440 mg/Kg	
	Sodium	-72.604 mg/Kg	
	Aluminum	5.768 mg/Kg	All soil samples in SDG WF008
	Beryllium	0.060 mg/Kg	
	Cobalt	-0.428 mg/Kg	
	Copper	0.728 mg/Kg	
	Iron	1.184 mg/Kg	
	Nickel	2.284 mg/Kg	
	Sodium	-74.238 mg/Kg	
	Thallium	-0.470 mg/Kg	

Table XIII
Summary of Method Blank Contamination
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF008	Aluminum	47.800 ug/L	All water samples in SDG WF008
	Beryllium	0.250 ug/L	
	Calcium	38.580 ug/L	
	Cobalt	-2.750 ug/L	
	Copper	6.560 ug/L	
	Iron	15.910 ug/L	
	Nickel	12.410 ug/L	
	Sodium	-320.390 ug/L	
	Zinc	2.210 ug/L	
	Cyanide	ND	All samples in SDG WF008
WF009	Aluminum	10.014 mg/Kg	All soil samples in SDG WF009
	Beryllium	0.068 mg/Kg	
	Copper	0.454 mg/Kg	
	Iron	3.440 mg/Kg	
	Sodium	-72.604 mg/Kg	
	Aluminum	5.768 mg/Kg	All soil samples in SDG WF009
	Beryllium	0.068 mg/Kg	
	Cobalt	-0.428 mg/Kg	
	Copper	0.728 mg/Kg	
	Iron	1.184 mg/Kg	
	Nickel	2.284 mg/Kg	
	Sodium	-74.238 mg/Kg	
	Thallium	-0.470 mg/Kg	
	Aluminum	47.800 ug/L	All water samples in SDG WF009
	Beryllium	0.250 ug/L	
	Calcium	38.580 ug/L	
	Cobalt	-2.750 ug/L	
	Copper	6.560 ug/L	
	Iron	15.910 ug/L	
	Nickel	12.410 ug/L	
	Sodium	-320.390 ug/L	
	Zinc	2.210 ug/L	
	Cyanide	ND	All samples in SDG WF009
WF010	Aluminum	6.602 mg/Kg	All soil samples in SDG WF010
	Beryllium	0.066 mg/Kg	
	Copper	0.482 mg/Kg	
	Iron	1.828 mg/Kg	
	Mercury	-0.008 mg/Kg	
	Sodium	-74.902 mg/Kg	
	Aluminum	47.800 ug/L	All water samples in SDG WF010
	Beryllium	0.250 ug/L	
	Calcium	38.580 ug/L	
	Cobalt	-2.750 ug/L	
	Copper	6.560 ug/L	
	Iron	15.910 ug/L	
	Nickel	12.410 ug/L	
	Sodium	-320.390 ug/L	
	Zinc	2.210 ug/L	
	Cyanide	ND	All samples in SDG WF010

Table XIII
Summary of Method Blank Contamination
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF11A	Iron	14.610 ug/L	All samples in SDG WF11A
	Nickel	11.200 ug/L	
	Sodium	22.840 ug/L	
	Zinc	2.170 ug/L	
	Cyanide	ND	All samples in SDG WF11A
	TRPH	ND	All samples in SDG WF11A
WF11B	Iron	14.610 ug/L	All water samples in SDG WF11B
	Nickel	11.200 ug/L	
	Sodium	22.840 ug/L	
	Zinc	2.170 ug/L	
	Aluminum	2.922 mg/Kg	All soil samples in SDG WF11B
	Calcium	10.253 mg/Kg	
	Iron	1.620 mg/Kg	
	Sodium	11.866 mg/Kg	
	Zinc	0.512 mg/Kg	
	Cyanide	ND	All samples in SDG WF11B
	TRPH	ND	All samples in SDG WF11B
WF012	Iron	14.610 ug/L	All water samples in SDG WF12
	Nickel	11.200 ug/L	
	Sodium	22.840 ug/L	
	Zinc	2.170 ug/L	
	Barium	0.081 mg/Kg	All soil samples in SDG WF12
	Calcium	6.408 mg/Kg	
	Iron	0.684 mg/Kg	
	Sodium	9.938 mg/Kg	
	Zinc	0.321 mg/Kg	
	Arsenic, TCLP	-0.01539 mg/L	All samples in SDG WF12
	Barium, TCLP	0.00054 mg/L	
	Lead, TCLP	-0.02157 mg/L	
	Silver, TCLP	-0.00215 mg/L	
WF013	Iron	14.610 ug/L	All water samples in SDG WF13
	Nickel	11.200 ug/L	
	Sodium	22.840 ug/L	
	Zinc	2.170 ug/L	
	Barium	0.082 mg/Kg	All soil samples in SDG WF13
	Calcium	9.329 mg/Kg	
	Iron	0.799 mg/Kg	
	Lead	0.120 mg/Kg	
	Magnesium	4.111 mg/Kg	
	Potassium	56.814 mg/Kg	
	Sodium	8.614 mg/Kg	
	Zinc	0.240 mg/Kg	

Table XIII
Summary of Method Blank Contamination
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes			
SDG	**Analyte**	**Concentration**	**Associated Samples**
WF014	Iron	14.610 ug/L	All water samples in SDG WF14
	Nickel	11.200 ug/L	
	Sodium	22.840 ug/L	
	Zinc	2.170 ug/L	
	Cyanide	2.034 ug/L	All water samples in SDG WF14
	Beryllium	-0.049 mg/Kg	All soil samples in SDG WF14
	Calcium	15.945 mg/Kg	
	Iron	0.701 mg/Kg	
	Manganese	0.103 mg/Kg	
	Sodium	14.786 mg/Kg	
	Zinc	0.601 mg/Kg	
WF015	Iron	4.210 ug/L	All water samples in SDG WF15
	Sodium	30.690 ug/L	
	Thallium	0.700 ug/L	
	Zinc	1.400 ug/L	
	Cyanide	2.034 ug/L	
	Aluminum	2.553 mg/Kg	All soil samples in SDG WF15
	Barium	0.093 mg/Kg	
	Beryllium	0.043 mg/Kg	
	Calcium	6.248 mg/Kg	
	Iron	0.759 mg/Kg	
	Sodium	4.452 mg/Kg	
	Zinc	0.365 mg/Kg	

Table XIV
Summary of Field Blank Contamination
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Parameter	Concentration	Qualifier
WF006	**Client ID:** 01R00101		
	Laboratory ID: G8876012		
	Collection Date: 12/6/95		
	Type: Rinsate		
	Calcium	178 ug/L	J
	Sodium	60.6 ug/L	UJ
	Zinc	2.9 ug/L	J
	Cyanide	ND	None
	TRPH	ND	None
WF006	**Client ID:** 01F00101		
	Laboratory ID: G8776013		
	Collection Date: 12/6/95		
	Type: Source Blank		
	Copper	3.3 ug/L	UJ
	Sodium	113 ug/L	UJ
	Cyanide	ND	None
	TRPH	ND	None
WF007	**Client ID:** 10R00101		
	Laboratory ID: G8889009		
	Collection Date: 12/7/95		
	Type: Rinsate		
	Aluminum	52.3 ug/L	UJ
	Barium	0.70 ug/L	J
	Beryllium	0.25 ug/L	UJ
	Calcium	23.0 ug/L	UJ
	Copper	7.1 ug/L	UJ
	Iron	67.3 ug/L	UJ
	Zinc	17.6 ug/L	J
	Cyanide	ND	None
	TRPH	ND	None
WF008	**Client ID:** 15R00101		
	Laboratory ID: G8913020		
	Collection Date: 12/11/95		
	Type: Rinsate		
	Aluminum	54.6 ug/L	UJ
	Barium	1.0 ug/L	J
	Beryllium	0.21 ug/L	UJ
	Calcium	22.6 ug/L	UJ
	Copper	5.0 ug/L	UJ
	Iron	45.4 ug/L	UJ
	Zinc	1.5 ug/L	UJ
	Cyanide	ND	None

Table XIV
Summary of Field Blank Contamination
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Parameter	Concentration	Qualifier
WF009	**Client ID:** 15R00201		
	Laboratory ID: G8914012		
	Collection Date: 12/11/95		
	Type: Rinsate		
	Aluminum	69.8 ug/L	UJ
	Barium	1.0 ug/L	J
	Beryllium	0.29 ug/L	UJ
	Calcium	58.5 ug/L	UJ
	Copper	6.5 ug/L	UJ
	Iron	29.2 ug/L	UJ
	Nickel	48.7 ug/L	U
	Zinc	2.7 ug/L	J
	Cyanide	ND	None
WF010	**Client ID:** 31R00101		
	Laboratory ID: G8924006		
	Collection Date: 12/12/965		
	Type: Rinsate		
	Aluminum	56.5 ug/L	UJ
	Barium	0.86 ug/L	J
	Beryllium	0.42 ug/L	UJ
	Calcium	18.7 ug/L	UJ
	Copper	5.2 ug/L	UJ
	Iron	35.6 ug/L	UJ
	Zinc	3.2 ug/L	UJ
WF11B	**Client ID:** 12R00101		
	Laboratory ID: RA847012		
	Collection Date: 1/5/96		
	Type: Rinsate		
	Barium	0.30 ug/L	J
	Calcium	42.3 ug/L	J
	Iron	11.6 ug/L	UJ
	Sodium	24.6 ug/L	UJ
	Zinc	2.2 ug/L	UJ
	Cyanide	ND	None
	TRPH	ND	None
WF012	**Client ID:** 31R00201		
	Laboratory ID: RA855021		
	Collection Date: 1/8/96		
	Type: Rinsate		
	Copper	1.3 ug/L	UJ
	Iron	21.2 ug/L	UJ
	Sodium	40.3 ug/L	UJ
	Zinc	3.0 ug/L	UJ
WF013	**Client ID:** 16R00101		
	Laboratory ID: RA856017		
	Collection Date: 1/9/96		
	Type: Rinsate		
	Iron	7.0 ug/L	UJ
	Sodium	30.0 ug/L	UJ
	Zinc	3.4ug/L	UJ

Table XIV
Summary of Field Blank Contamination
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Parameter	Concentration	Qualifier
WF014	**Client ID:** BKR00101		
	Laboratory ID: RA870001		
	Collection Date: 1/10/96		
	Type: Rinsate		
	Calcium	42.3 ug/L	J
	Iron	7.8 ug/L	UJ
	Sodium	31.9 ug/L	UJ
	Zinc	1.8 ug/L	UJ
	Cyanide	2.0 ug/L	UJ
WF015	**Client ID:** COR00101		
	Laboratory ID: RA908001		
	Collection Date: 1/18/96		
	Type: Rinsate		
	Iron	9.1 ug/L	UJ
	Lead	0.60 ug/L	J
	Sodium	58.6 ug/L	UJ
	Thallium	0.70 ug/L	UJ
	Zinc	2.2 ug/L	UJ
	Cyanide	2.0 ug/L	UJ
WF015	**Client ID:** COF00101		
	Laboratory ID: RA908002		
	Collection Date: 1/18/96		
	Type: Source Blank		
	Iron	8.9 ug/L	UJ
	Sodium	55.0 ug/L	UJ
	Zinc	2.0 ug/L	UJ

Table XV
Sample Event PARCC Summary
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton, Florida

SDG	Fraction	Precision[1]	Accuracy[2]	Representativeness	Completeness (%)	Comparability
WF006	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
	TRPH	Acceptable	Acceptable	Acceptable	100	Acceptable
WF007	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
	TRPH	Acceptable	Acceptable	Acceptable	100	Acceptable
WF008	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF009	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	99.5[3]	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF010	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF11A	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
	TRPH	Acceptable	Acceptable	Acceptable	100	Acceptable
WF11B	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
	TRPH	Acceptable	Acceptable	Acceptable	100	Acceptable
WF012	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF013	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	94.4[3]	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF014	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	99.7[3]	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable

Table XV
Sample Event PARCC Summary
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton, Florida

SDG	Fraction	Precision[1]	Accuracy[2]	Representativeness	Completeness (%)	Comparability
WF015	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	80.0[3]	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable

[1]Cumulative of sampling and analytical components.
[2]Analytical component.
[3]A few samples have results whose concentrations were rejected.

Notes: All completeness is expressed as the ratio of number of sample results considered usable (i.e., not qualified as rejected) to the total number of sample results.

% = percent
TRPH = Total Recoverable Petroleum Hydrocarbons

APPENDIX A

Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida
PARCC Summary Tables

Draft Version

12/12/97

APPENDIX A

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NAS Whiting Field, Milton, Florida

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SDG#: WF022 | VALIDATION SAMPLE TABLE | LDC#: 1932A

Project Name: NAS Whiting Field | Parameters/Analytical Method | Job#: 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides /PCBs	Metals	Cyanide
BKT01001	RB858001	TB	water	7-16-96	X				
BKR01001	RB858002	R	water	7-16-96	X	X	X	X	X
BKG00101	RB858003		water	7-16-96	X	X	X	X	X
BKG00101D	RB858004	FD	water	7-16-96	X	X	X	X	X
BKG00102	RB858005		water	7-16-96	X	X	X	X	X
BKG00102F	RB858006		water	7-16-96				X	
BKG00103	RB858007		water	7-16-96	X	X	X	X	X
BKG00202	RB858008		water	7-17-96	X	X	X	X	X
BKG00201	RB858009		water	7-17-96	X	X	X	X	X
BKF01001	RB858010	SB	water	7-17-96	X	X	X	X	X
17T01101	RB873001	TB	water	7-18-96	X				
17G00102	RB873002		water	7-18-96	X	X	X	X	X
17G00101	RB873003		water	7-18-96	X	X	X	X	X
17G00201	RB873004		water	7-18-96	X	X	X	X	X
17G00301	RB873005		water	7-18-96	X	X	X	X	X
17G00201F	RB873006		water	7-18-96				X	
01G00101	RB873007		water	7-19-96	X	X	X	X	X
01G00102	RB873008		water	7-19-96	X	X	X	X	X
01G00102D	RB873009		water	7-19-96	X	X	X	X	X
BKG00101MS	RB858003MS	MS	water	7-16-96	X	X	X	X	X
BKG00101MSD	RB858003MSD	MSD	water	7-16-96	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF023 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1942A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides /PCBs	Metals	Cyanide
01T01201	RB887001	TB	water	7-22-96	X				
01G00401	RB887002		water	7-22-96	X	X	X	X	X
01G00201	RB887003		water	7-22-96	X	X	X	X	X
01G00201F	RB887004		water	7-22-96				X	
01R01101	RB887005	R	water	7-23-96	X	X	X	X	X
01G00301	RB887006		water	7-23-96	X	X	X	X	X
BKG00301	RB887007		water	7-23-96	X	X	X	X	X
02G00201	RB887008		water	7-23-96	X	X	X	X	X
02G00101	RB887009		water	7-23-96	X	X	X	X	X
02G00101F	RB887010		water	7-23-96				X	
18G00301	RB887011		water	7-24-96	X	X	X	X	X
02G00301	RB887012		water	7-24-96	X	X	X	X	X
02G00301D	RB887013	FD	water	7-24-96	X	X	X	X	X
16T01301	RB887014		water	7-25-96	X				
16G00701	RB887015		water	7-25-96	X	X	X	X	X
16G00702	RB887016		water	7-25-96	X	X	X	X	X
16G00702DL	RB887016DL		water	7-25-96	X				
16G00703	RB887017		water	7-25-96	X	X	X	X	X
16G00703DL	RB887017DL		water	7-25-96	X				
18G00201	RB887018		water	7-26-96	X	X	X	X	X
02G00301MS	RB887012MS	MS	water	7-24-96	X	X	X	X	X
02G00301MSD	RB887012MSD	MSD	water	7-24-96	X	X	X	X	X

= Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

T

SDG#: WF024 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1943A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides /PCBs	Metals	Cyanide
18T01401	RB920001	TB	water	7-29-96	X				
18G00101	RB920002		water	7-29-96	X	X	X	X	X
15G00401	RB920003		water	7-30-96	X	X	X	X	X
BKG00203	RB920004		water	7-30-96	X	X	X	X	X
15R01201	RB920005	R	water	7-31-96	X	X	X	X	X
BKG00203F	RB920006		water	7-30-96				X	
15G00702	RB920007		water	7-31-96	X	X	X	X	X
15G00702F	RB920008		water	7-31-96				X	
15G00701	RB920009		water	7-31-96	X	X	X	X	X
15G00701D	RB920010	FD.	water	7-31-96	X	X	X	X	X
15G00701MS	RB920009MS	MS	water	7-31-96	X	X	X	X	X
15G00701MSD	RB920009MSD	MSD	water	7-31-96	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF025 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1956A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides /PCBs	Metals	Cyanide
15T01501	RB956001	TB	water	8-5-96	X				
15G00703	RB956002		water	8-5-96	X	X	X	X	X
15G00503	RB956003		water	8-6-96	X	X	X	X	X
15G00503DL	RB956003DL		water	8-6-96	X				
15G00502	RB956004		water	8-6-96	X	X	X	X	X
15G00501	RB956005		water	8-6-96	X	X	X	X	X
15G00601	RB956006		water	8-7-96	X	X	X	X	X
15G00603	RB956007		water	8-7-96	X	X	X	X	X
15G00601D	RB956008	FD	water	8-7-96	X	X	X	X	X
15G00503F	RB956009		water	8-6-96				X	
15G00501F	RB956010		water	8-6-96				X	
15R01301	RB956011	R	water	8-7-96	X	X	X	X	X
15T01601	RB956012	TB	water	8-8-96	X				
15G00301	RB956013		water	8-8-96	X	X	X	X	X
15G00302	RB956014		water	8-8-96	X	X	X	X	X
15G00303	RB956015		water	8-9-96	X	X	X	X	X
15G00101	RB956016		water	8-8-96	X	X	X	X	X
15G00203	RB956017		water	8-9-96	X	X	X	X	X
15G00301F	RB956018		water	8-8-96				X	
15G00203F	RB956019		water	8-9-96				X	
15G00601MS	RB956006MS	MS	water	8-7-96	X	X	X	X	X
15G00601MSD	RB956006MSD	MSD	water	8-7-96	X	X	X	X	X

= Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

T

SDG#: WF026 | VALIDATION SAMPLE TABLE | **LDC#:** 1957A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides /PCBs	Metals	Cyanide
15T01701	RB980001	TB	water	8-12-96	X				
15G00202	RB980002		water	8-12-96	X	X	X	X	X
15G00201	RB980003		water	8-13-96	X	X	X	X	X
15G00802	RB980004		water	8-13-96	X	X	X	X	X
15G00802R	RB980004R		water	8-13-96		X			
15G00801	RB980005		water	8-13-96	X	X	X	X	X
16G00201	RB980006		water	8-14-96	X	X	X	X	X
15G00803	RB980007		water	8-14-96	X	X	X	X	X
16G00803D	RB980008	FD	water	8-14-96	X	X	X	X	X
15G00202F	RB980009		water	8-12-96				X	
15G00201F	RB980010		water	8-13-96				X	
15G00802F	RB980011		water	8-13-96				X	
15R01401	RB980012	R	water	8-14-96	X	X	X	X	X
15G00803F	RB980013		water	8-14-96				X	
16G00201F	RB980014		water	8-14-96				X	
16T01801	RB980015	TB	water	8-15-96	X				
16G00202	RB980016		water	8-15-96	X	X	X	X	X
16G00202DL	RB980016DL		water	8-15-96	X				
16G00203	RB980017		water	8-15-96	X	X	X	X	X
16G00602	RB980018		water	8-15-96	X	X	X	X	X
16G00601	RB980019		water	8-16-96	X	X	X	X	X
16G00403	RB980020		water	8-16-96	X	X	X	X	X
16G00403DL	RB980020DL		water	8-16-96	X				
16G00403D	RB980021		water	8-16-96	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF026 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1957A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides /PCBs	Metals	Cyanide
16G00403DDL	RB980021DL		water	8-16-96	X				
16G00601F	RB980022		water	8-16-96				X	
16G00403F	RB980023		water	8-16-96				X	
15G00803MS	RB980007MS	MS	water	8-14-96	X	X	X	X	X
15G00803MSD	RB980007MSD	MSD	water	8-14-96	X	X	X	X	X

= Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

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SDG#: WF025 | **VALIDATION SAMPLE TABLE** | **LOC#:** 1970A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	Pesticides/PCBs
15G00502RE	RB956004RE		water	8-6-96	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF027 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1970B

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides /PCBs	Metals	Cyanide
16T01901	RC016001	TB	water	8-19-96	X				
16G00401	RC016002		water	8-19-96	X	X	X	X	X
16G00402	RC016003		water	8-19-96	X	X	X	X	X
16G00101	RC016004		water	8-19-96	X	X	X	X	X
16G00301	RC016005		water	8-20-96	X	X	X	X	X
16G00302	RC016006		water	8-20-96	X	X	X	X	X
16G00304	RC016007		water	8-20-96	X	X	X	X	X
16G00303	RC016008		water	8-21-96	X	X	X	X	X
16G00501	RC016009		water	8-21-96	X	X	X	X	X
16G00303F	RC016010		water	8-21-96				X	
16G00501F	RC016011		water	8-21-96				X	
16R01501	RC016012	R	water	8-21-96	X	X	X	X	X
16G00501D	RC016013	FD	water	8-21-96	X	X	X	X	X
66T02001	RC016014	TB	water	8-22-96	X				
66G02101	RC016015		water	8-22-96	X	X	X	X	X
66G02103	RC016016		water	8-22-96	X	X	X	X	X
66G02102	RC016017		water	8-22-96	X	X	X	X	X
09G00101	RC016018		water	8-23-96	X	X	X	X	X
09G00301	RC016019		water	8-23-96	X	X	X	X	X
09G00301D	RC016020	FD	water	8-23-96	X	X	X	X	X
66G02102F	RC016021		water	8-23-96				X	
09G00301F	RC016022		water	8-23-96				X	
16G00501MS	RC016009MS	MS	water	8-21-96	X	X	X	X	X
16G00501MSD	RC016009MSD	MSD	water	8-21-96	X	X	X	X	X

= Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

SDG#: WF028 | VALIDATION SAMPLE TABLE | DC#: 1974A

Project Name: NAS Whiting Field | Parameters/Analytical Method | Job#: 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides /PCBs	Metals	Cyanide
10T02101	RC044001	TB	water	8-26-96	X				
09G00201	RC044002		water	8-26-96	X	X	X	X	X
10G00101	RC044003		water	8-26-96	X	X	X	X	X
10G00201	RC044004		water	8-26-96	X	X	X	X	X
11G00402	RC044005		water	8-26-96	X	X	X	X	X
11G00102	RC044006		water	8-27-96	X	X	X	X	X
11G00401	RC044007		water	8-27-96	X	X	X	X	X
11T02201	RC044008	TB	water	8-28-96	X				
11G00301	RC044009		water	8-28-96	X	X	X	X	X
11G00101	RC044010		water	8-28-96	X	X	X	X	X
11G00201	RC044011		water	8-28-96	X	X	X	X	X
12G00101	RC044012		water	8-27-96	X	X	X	X	X
12G00201	RC044013		water	8-27-96	X	X	X	X	X
11G00201F	RC044014		water	8-28-96				X	
11G00301F	RC044015		water	8-28-96				X	
11R01601	RC044016		water	8-28-96	X	X	X	X	X
12G00101D	RC044017	FD	water	8-27-96	X	X	X	X	X
11G00201D	RC044018	FD	water	8-28-96	X	X	X	X	X
12G00101MS	RC044012MS	MS	water	8-27-96	X	X	X	X	X
12G00101MSD	RC044012MSD	MSD	water	8-27-96	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF029 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1989A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides /PCBs	Metals	Cyanide
13T02301	RC092001	TB	water	9-9-96	X				
13G00101	RC092002		water	9-9-96	X	X	X	X	X
13G00102	RC092003		water	9-9-96	X	X	X	X	X
13G00201	RC092004		water	9-10-96	X	X	X	X	X
13G00103	RC092005		water	9-10-96	X	X	X	X	X
14G00201	RC092006		water	9-10-96	X	X	X	X	X
14G00101	RC092007		water	9-11-96	X	X	X	X	X
13R01701	RC092008	R	water	9-11-96	X	X	X	X	X
14G00101D	RC092009	FD	water	9-11-96	X	X	X	X	X
13G00103F	RC092010		water	9-10-96				X	
66T02401	RC092011	TB	water	9-12-96	X				
66G00901	RC092012		water	9-12-96	X	X	X	X	X
66G00904	RC092013		water	9-12-96	X	X	X	X	X
66G00902	RC092014		water	9-13-96	X	X	X	X	X
66G00903	RC092015		water	9-13-96	X	X	X	X	X
66G00903F	RC092016		water	9-13-96				X	
14G00101MS	RC092007MS	MS	water	9-11-96	X	X	X	X	X
14G00101MSD	RC092007MSD	MSD	water	9-11-96	X	X	X	X	X

= Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

SDG#: WF030 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2000A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides /PCBs	Metals	Cyanide
66T02501	RC121001	TB	water	9-16-96	X				
66G00801	RC121002		water	9-16-96	X	X	X	X	X
66G00802	RC121003		water	9-16-96	X	X	X	X	X
66G00803	RC121004		water	9-17-96	X	X	X	X	X
66G00804	RC121005		water	9-17-96	X	X	X	X	X
66G00602	RC121006		water	9-17-96	X	X	X	X	X
66G00601	RC121007		water	9-18-96	X	X	X	X	X
66G00603	RC121008		water	9-18-96	X	X	X	X	X
66G00804F	RC121009		water	9-17-96				X	
66R01801	RC121010		water	9-18-96	X	X	X	X	X
66G00601D	RC121011	FD	water	9-18-96	X	X	X	X	X
66T02601	RC121012	TB	water	9-19-96	X				
66G00604	RC121013		water	9-19-96	X	X	X	X	X
66G02201	RC121014		water	9-19-96	X	X	X	X	X
66G02202	RC121015		water	9-19-96	X	X	X	X	X
66G02203	RC121016		water	9-20-96	X	X	X	X	X
66G02203D	RC121017	FD	water	9-20-96	X	X	X	X	X
66G00601MS	RC121007MS	MS	water	9-18-96	X	X	X	X	X
66G00601MSD	RC121007MSD	MSD	water	9-18-96	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF031 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2031A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides /PCBs	Metals	Cyanide
05T02701	MB928001	TB	water	9-23-96	X				
05G00801	MB928002		water	9-23-96	X	X	X	X	X
05G00802	MB928003		water	9-23-96	X	X	X	X	X
05G00901	MB928004		water	9-24-96	X	X	X	X	X
05G00902	MB928005		water	9-24-96	X	X	X	X	X
05G01002	MB928006		water	9-24-96	X	X	X	X	X
05G01001	MB928007		water	9-25-96	X	X	X	X	X
05G00301	MB928008		water	9-25-96	X	X	X	X	X
05G00301RE	MB928008RE		water	9-25-96		X			
05G00801F	MB928009		water	9-23-96				X	
05G00902F	MB928010		water	9-24-96				X	
05R01901	MB928011	R	water	9-25-96	X	X	X	X	X
05G01001D	MB928012	FD	water	9-25-96	X	X	X	X	X
33T02801	MB958001	TB	water	9-26-96	X				
05G00101	MB958002		water	9-26-96	X	X	X	X	X
33G00501	MB958003		water	9-26-96	X	X	X	X	X
33G00201	MB958004		water	9-26-96	X	X	X	X	X
33G00101	MB958005		water	9-27-96	X	X	X	X	X
33G00301	MB958006		water	9-27-96	X	X	X	X	X
33G00301D	MB958007	FD	water	9-27-96	X	X	X	X	X
05G01001MS	MB928007MS	MS	water	9-25-96	X	X	X	X	X
05G01001MSD	MB928007MSD	MSD	water	9-25-96	X	X	X		
05G01001DUP	MB928007DUP	DUP	water	9-25-96				X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

T

SDG#: WF031B

VALIDATION SAMPLE TABLE

DC#: 2121A

Project Name: NAS Whiting Field

Parameters/Analytical Method

Job#: 7560-32

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (CLP-1.9)	SVOA (CLP-1.9)	Pesticides /PCBs (CLP-1.9)	Metals (CLP-2.1)	Cyanide
05G01002	MC447001		water	11-21-96	X	X	X	X	X
16T04001	MC447002	TB	water	11-21-96	X				

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF032 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2046A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (CLP-1.9)	SVOA (CLP-1.9)	Pesticides /PCBs (CLP-1.9)	Metals	Cyanide
06T02901	MC011001	TB	water	9-30-96	X				
33G00401	MC011002		water	9-30-96	X	X	X	X	X
06G00102	MC011003		water	10-1-96	X	X	X	X	X
06G00101	MC011004		water	10-1-96	X	X	X	X	X
06G00301	MC011005		water	10-2-96	X	X	X	X	X
06R02001	MC011006	R	water	10-2-96	X	X	X	X	X
29G00501	MC011007		water	10-2-96	X	X	X	X	X
29G00501D	MC011008	FD	water	10-2-96	X	X	X	X	X
29T03001	MC037001	TB	water	10-3-96	X				
29G00101	MC037002		water	10-3-96	X	X	X	X	X
66G01201	MC037003		water	10-3-96	X	X	X	X	X
66G00102	MC037004		water	10-4-96	X	X	X	X	X
29G00501MS	MC011007MS	MS	water	10-2-96	X	X	X	X	X
29G00501MSD	MC011007MSD	MSD	water	10-2-96	X	X	X		
29G00501DUP	MC011007DUP	DUP	water	10-2-96				X	X

Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

SDG#: WF033 | **VALIDATION SAMPLE TABLE** | **DC#:** 2069A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (CLP-1.9)	SVOA (CLP-1.9)	Pesticides /PCBs (CLP-1.9)	Metals	Cyanide
29T03101	MC085001	TB	water	10-7-96	X				
26G00401	MC085002		water	10-7-96	X	X	X	X	X
26G00301	MC085003		water	10-8-96	X	X	X	X	X
66G00202	MC085004		water	10-8-96	X	X	X	X	X
29G00201	MC085005		water	10-8-96	X	X	X	X	X
66G01901	MC085006		water	10-9-96	X	X	X	X	X
66R02101	MC085007	R	water	10-9-96	X	X	X	X	X
66T03201	MC118001	TB	water	10-10-96	X				
66G00201	MC118002		water	10-9-96	X	X	X	X	X
66G00201D	MC118003	FD	water	10-9-96	X	X	X	X	X
07G00101	MC118004		water	10-10-96	X	X	X	X	X
30G00501	MC118005		water	10-10-96	X	X	X	X	X
66G00301	MC118006		water	10-11-96	X	X	X	X	X
66G00201MS	MC118002MS	MS	water	10-9-96	X	X	X	X	X
66G00201MSD	MC118002MSD	MSD	water	10-9-96	X	X	X		
66G00201DUP	MC118002DUP	DUP	water	10-9-96				X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF034 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2070A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (CLP-1.9)	SVOA (CLP-1.9)	Pesticides /PCBs (CLP-1.9)	Metals	Cyanide
66T03301	MC153001	TB	water	10-14-96	X				
66G02001	MC153002		water	10-14-96	X	X	X	X	X
66G00302	MC153003		water	10-15-96	X	X	X	X	X
66G01801	MC153004		water	10-16-96	X	X	X	X	X
30G00301	MC153005		water	10-16-96	X	X	X	X	X
30G00401	MC153006		water	10-16-96	X	X	X	X	X
66R02201	MC153007	R	water	10-16-96	X	X	X	X	X
30G00301D	MC153008	FD	water	10-16-96	X	X	X	X	X
66T03401	MC176001	TB	water	10-17-96	X				
66G01101	MC176002		water	10-17-96	X	X	X	X	X
66G01301	MC176003		water	10-17-96	X	X	X	X	X
66G00501	MC176004		water	10-18-96	X	X	X	X	X
66G00501F	MC176005		water	10-18-96				X	
30G00301MS	MC153005MS	MS	water	10-16-96	X	X	X	X	X
30G00301MSD	MC153005MSD	MSD	water	10-16-96	X	X	X		
30G00301DUP	MC153005DUP	DUP	water	10-16-96				X	X

= Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

SDG#: WF035 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2076A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (CLP-1.9)	SVOA (CLP-1.9)	Pesticides /PCBs (CLP-1.9)	Metals	Cyanide
66T03501	MC214001	TB	water	10-21-96	X				
66G00401	MC214002		water	10-21-96	X	X	X	X	X
66G01601	MC214003		water	10-22-96	X	X	X	X	X
66G01501	MC214004		water	10-22-96	X	X	X	X	X
66G01701	MC214005		water	10-23-96	X	X	X	X	X
66R02301	MC214006	R	water	10-23-96	X	X	X	X	X
66G01701D	MC214007	FD	water	10-23-96	X	X	X	X	X
66T03601	MC231001	TB	water	10-24-96	X				
66G00101	MC231002		water	10-24-96	X	X	X	X	X
08G00101	MC231003		water	10-24-96	X	X	X	X	X
66G01001	MC231004		water	10-25-96	X	X	X	X	X
66G01701MS	MC214005MS	MS	water	10-23-96	X	X	X	X	X
66G01701MSD	MC214005MSD	MSD	water	10-23-96	X	X	X		
66G01701DUP	MC214005DUP	DUP	water	10-23-96				X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF036 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2077A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (CLP-1.9)	SVOA (CLP-1.9)	Pesticides /PCBs (CLP-1.9)	Metals	Cyanide
66T03701	MC262001	TB	water	10-28-96	X				
66G00701	MC262002		water	10-29-96	X	X	X	X	X
54G00201	MC262003		water	10-29-96	X	X	X	X	X
54G00101	MC262004		water	10-30-96	X	X	X	X	X
31G00201	MC262005		water	10-30-96	X	X	X	X	X
31G00201F	MC262006		water	10-30-96				X	
54R02401	MC262007	R	water	10-30-96	X	X	X	X	X
54G00101D	MC262008	FD	water	10-30-96	X	X	X	X	X
31T03801	MC284001	TB	water	10-31-96	X				
31G00301	MC284002		water	10-31-96	X	X	X	X	X
31G00402	MC284003		water	10-31-96	X	X	X	X	X
31G00403	MC284004		water	11-1-96	X	X	X	X	X
54G00101MS	MC262004MS	MS	water	10-30-96	X	X	X	X	X
54G00101MSD	MC262004MSD	MSD	water	10-30-96	X	X	X		
54G00101DUP	MC262004DUP	DUP	water	10-30-96				X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

SDG#: WF037 | VALIDATION SAMPLE TABLE | LDC#: 2071A

Project Name: NAS Whiting Field | Parameters/Analytical Method | Job#: 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (CLP-1.9)	SVOA (CLP-1.9)	Pesticides /PCBs (CLP-1.9)	Metals	Cyanide
15T03901	MC424001	TB	water	11-18-96	X				
15G00502	MC424002		water	11-18-96	X				
15G00503	MC424003		water	11-18-96	X				
16G00202	MC424004		water	11-19-96	X				
16G00203	MC424005		water	11-19-96	X				
15G00802	MC424006		water	11-20-96	X				
15G00803	MC424007		water	11-20-96	X				
15G00803D	MC424008	FD	water	11-20-96	X				
15R02501	MC424009	R	water	11-20-96	X				
15F00201	MC424010		water	11-20-96	X	X	X	X	X
16G00702	MC448001		water	11-21-96	X				
16G00703	MC448002		water	11-21-96	X				
16G00403	MC448003		water	11-22-96	X				
16T04001	MC448004	TB	water	11-21-96	X				
15G00803MS	MC424007MS	MS	water	11-20-96	X				
15G00803MSD	MC424007MSD	MSD	water	11-20-96	X				

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF038 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2099A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 7560-32

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (CLP-1.9)
36T04101	MC687001	TB	water	12-17-96	X
36BO0101	MC687002		soil	12-17-96	X
36BO0102	MC687003		soil	12-17-96	X
36BO0103	MC687004		soil	12-17-96	X
36BO0201	MC687005		soil	12-17-96	X
36BO0202	MC687006		soil	12-17-96	X
36BO0203	MC687007		soil	12-17-96	X
36BO0301	MC687008		soil	12-17-96	X
36BO0302	MC687009		soil	12-17-96	X
36BO0303	MC687010		soil	12-17-96	X
36BO0303D	MC687011	FD	soil	12-17-96	X
36BO0401	MC687012		soil	12-18-96	X
36BO0401DL	MC687012DL		soil	12-18-96	X
36BO0402	MC687013		soil	12-18-96	X
36BO0403	MC687014		soil	12-18-96	X
36BO0403D	MC687015	FD	soil	12-18-96	X
36RO2601	MC687016	R	water	12-18-96	X
36BO0303MS	MC687011MS	MS	soil	12-17-96	X
36BO0303MSD	MC687011MSD	MSD	soil	12-17-96	X

= Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

SDG#: WF039 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2102A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 7560-32

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (CLP-1.9)
35TO4201	MC698001	TB	water	12-19-96	X
35BO0101	MC698002		soil	12-20-96	X
35BO0102	MC698003		soil	12-20-96	X
35BO0102DL	MC698003DL		soil	12-20-96	X
35BO0103	MC698004		soil	12-20-96	X
35BO0104	MC698005		soil	12-20-96	X
35BO0105	MC698006		soil	12-20-96	X
35BO0106	MC698007		soil	12-21-96	X
35BO0201	MC698008		soil	12-21-96	X
35BO0202	MC698009		soil	12-21-96	X
35BO0203	MC698010		soil	12-21-96	X
35RO2701	MC698011	R	water	12-21-96	X
35BO0301	MC698012		soil	12-21-96	X
35BO0302	MC698013		soil	12-21-96	X
35BO0303	MC698014		soil	12-21-96	X
35BO0302D	MC698015	FD	soil	12-21-96	X
35BO0203D	MC698016	FD	soil	12-21-96	X
35BO0203MS	MC698010MS	MS	soil	12-21-96	X
35BO0203MSD	MC698010MSD	MSD	soil	12-21-96	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF040 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2120A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 7560-32

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (CLP-1.9)
35TO4301	MC783001	TB	water	1-7-97	X
35BO0401	MC783002		soil	1-7-97	X
35BO0402	MC783003		soil	1-7-97	X
35BO0403	MC783004		soil	1-7-97	X
35BO0501	MC783005		soil	1-7-97	X
35BO0501DL	MC783005DL		soil	1-7-97	X
35BO0502	MC783006		soil	1-7-97	X
35BO0503	MC783007		soil	1-7-97	X
35BO0201	MC783008		soil	1-8-97	X
35BO0202	MC783009		soil	1-8-97	X
35BO0203	MC783010		soil	1-8-97	X
35BO0101	MC783011		soil	1-8-97	X
35BO0102	MC783012		soil	1-8-97	X
35BO0103	MC783013		soil	1-8-97	X
35BO0301	MC783014		soil	1-9-97	X
35BO0302	MC783015		soil	1-9-97	X
35BO0303	MC783016		soil	1-9-97	X
35R02801	MC783017	R	water	1-9-97	X
35BO0203D	MC783018	FD	soil	1-8-97	X
35BO0103D	MC783019	FD	soil	1-8-97	X
35BO0203MS	MC783010MS	MS	soil	1-8-97	X
35BO0203MSD	MC783010MSD	MSD	soil	1-8-97	X

= Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

SDG#: WF041 VALIDATION SAMPLE TABLE LDC#: 2323A

Project Name: NAS Whiting Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)	SVOA (1.9)	Pesticides /PCBs (1.9)	Metals (2.1)
35T04501	MD908001	TB	water	6-11-97	X			
35F00301	MD908002		water	6-11-97	X	X	X	X
35R03001	MD908003	R	water	6-11-97	X	X	X	X
35G00101	MD908004		water	6-11-97	X	X	X	X
35G00101D	MD908005	FD	water	6-11-97	X	X	X	X
35G00101DRE	MD908005RE	FD	water	6-11-97		X		
35G00103	MD908006		water	6-11-97	X	X	X	X
35G00103F	MD908007		water	6-11-97				X
35G00102	MD908008		water	6-12-97	X	X	X	X
37G00102	MD908009		water	6-12-97	X	X	X	X
37T04601	MD926001	TB	water	6-12-97	X			
36G00101	MD926002		water	6-12-97	X	X	X	X
36G00101F	MD926003		water	6-12-97				X
37G00101	MD926004		water	6-12-97	X	X	X	X
36G00102	MD926005		water	6-13-97	X	X	X	X
36G00102RE	MD926005RE		water	6-13-97		X		
36G00103	MD926006		water	6-13-97	X	X	X	X
36G00103RE	MD926006RE		water	6-13-97		X		
35T04701	MD950001	TB	water	6-15-97	X			
35G00202	MD950002		water	6-15-97	X	X	X	X
35G00202D	MD950003	FD	water	6-15-97	X	X	X	X
35G00203	MD950004		water	6-15-97	X	X	X	X
35G00201	MD950005		water	6-16-97	X	X	X	X
35G00201F	MD950006		water	6-16-97				X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF041 **VALIDATION SAMPLE TABLE** **LDC#:** 2323A

Project Name: NAS Whiting Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)	SVOA (1.9)	Pesticides /PCBs (1.9)	Metals (2.1)
13T04801	MD985001	TB	water	6-16-97	X			
13G00301	MD985002		water	6-16-97	X	X	X	X
13G00301F	MD985003		water	6-16-97				X
13G00401	MD985004		water	6-16-97	X	X	X	X
35G00101MS	MD908004MS	MS	water	6-11-97	X	X	X	X
35G00101MSD	MD908004MSD	MSD	water	6-11-97	X	X	X	
35G00101DUP	MD908004DUP	DUP	water	6-11-97				X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

T

SDG#: WF042 | **VALIDATION SAMPLE TABLE** | **DC#:** 2311A

Project Name: NAS Whiting | Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)
05T04901	ME007001	TB	water	6-18-97	X
05G00301	ME007002		water	6-17-97	X
05G00901	ME007003		water	6-18-97	X
05G00902	ME007004		water	6-19-97	X
05G00902D	ME007005	FD	water	6-19-97	X
05R03101	ME007006	R	water	6-17-97	X
05T05001	ME021001		water	6-20-97	X
05G01001	ME021002		water	6-20-97	X
05G01002	ME021003		water	6-20-97	X
05G00902MS	ME007004MS	MS	water	6-19-97	X
05G00902MSD	ME007004MSD	MSD	water	6-19-97	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF043 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2315A

Project Name: NAS Whiting | Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)
05T05101	ME042001	TB	water	6-23-97	X
05R03201	ME042002	R	water	6-23-97	X
05G00801	ME042003		water	6-24-97	X
05G00802	ME042004		water	6-24-97	X
05G00802D	ME042005	FD	water	6-24-97	X
33T05201	ME053001	TB	water	6-24-97	X
33G00501	ME053002		water	6-24-97	X
33G00101	ME053003		water	6-24-97	X
33G00201	ME053004		water	6-25-97	X
33G00301	ME053005		water	6-25-97	X
33G00301DL	ME053005DL		water	6-25-97	X
33T05301	ME073001	TB	water	6-25-97	X
06G00102	ME073002		water	6-26-97	X
06G00301	ME073003		water	6-26-97	X
33G00401	ME073004		water	6-26-97	X
30T05401	ME087001	TB	water	6-26-97	X
07G00101	ME087002		water	6-26-97	X
07G00101D	ME087003	FD	water	6-26-97	X
30G00501	ME087004		water	6-26-97	X
30G00301	ME087005		water	6-27-97	X
30G00401	ME087006		water	6-27-97	X
05G00802MS	ME042004MS	MS	water	6-24-97	X
05G00802MSD	ME042004MSD	MSD	water	6-24-97	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

T

SDG#: WF044 | VALIDATION SAMPLE TABLE | DC#: 2322A

Project Name: NAS Whiting | Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)
06T05501	ME100001	TB	water	6-29-97	X
06R03301	ME100002	R	water	6-29-97	X
66G00201	ME100003		water	6-29-97	X
06G00101	ME100004		water	6-29-97	X
66G00202	ME100005		water	6-30-97	X
66T05601	ME110001	TB	water	6-30-97	X
66G01201	ME110002		water	6-30-97	X
66G01201D	ME110003	FD	water	6-30-97	X
66G00102	ME110004		water	7-1-97	X
66G01301	ME110005		water	7-1-97	X
66T05701	ME133001	TB	water	7-2-97	X
66G00401	ME133002		water	7-2-97	X
66G02001	ME133003		water	7-2-97	X
66T05801	ME135001	TB	water	7-2-97	X
66G00603	ME135002		water	7-2-97	X
66G00603D	ME135003	FD	water	7-2-97	X
66G00604	ME135004		water	7-2-97	X
66G00601	ME135005		water	7-3-97	X
66G00602	ME135006		water	7-3-97	X
66G01201MS	ME110002MS	MS	water	6-30-97	X
66G01201MSD	ME110002MSD	MSD	water	6-30-97	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF045 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2345A

Project Name: NAS Whiting

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)	SVOA (1.9)	Pesticides /PCBs (1.9)	Metals (2.1)	Cyanide
					Parameters/Analytical Method				
OWT05901	ME149001	TB	water	7-7-97	X				
OWR03401	ME149002	R	water	7-7-97	X	X	X	X	X
OWG00501	ME149003		water	7-8-97	X	X	X	X	X
OWG00502	ME149004		water	7-8-97	X	X	X	X	X
OWG00502D	ME149005	FD	water	7-8-97	X	X	X	X	X
OWG00503	ME149006		water	7-8-97	X	X	X	X	X
OWG00503F	ME149007		water	7-8-97				X	
OWT06001	ME159001	TB	water	7-8-97	X				
OWG00101	ME159002		water	7-9-97	X	X	X	X	X
OWG00101RE	ME159002RE		water	7-9-97		X			
OWG00102	ME159003		water	7-9-97	X	X	X	X	X
OWG00102RE	ME159003RE		water	7-9-97		X			
OWG00103	ME159004		water	7-9-97	X	X	X	X	X
OWG00103RE	ME159004RE		water	7-9-97		X			
66T06101	ME175001	TB	water	7-9-97	X				
66G02301	ME175002		water	7-9-97	X	X	X	X	X
66G02301RE	ME175002RE		water	7-9-97		X			
66G02302	ME175003		water	7-9-97	X	X	X	X	X
66G02303	ME175004		water	7-10-97	X	X	X	X	X
OWT06201	ME190001	TB	water	7-10-97	X				
OWG00302	ME190002		water	7-10-97	X	X	X	X	X
OWG00302D	ME190003	FD	water	7-10-97	X	X	X	X	X
OWG00303	ME190004		water	7-10-97	X	X	X	X	X
OWG00301	ME190005		water	7-11-97	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

SDG#: WF045 | **VALIDATION SAMPLE TABLE** | **DC#:** 2345A

Project Name: NAS Whiting

					Parameters/Analytical Method				
Client ID #	**Lab ID #**	**QC Type**	**Matrix**	**Date Collected**	**VOA (1.9)**	**SVOA (1.9)**	**Pesticides /PCBs (1.9)**	**Metals (2.1)**	**Cyanide**
OWG00301F	ME190006		water	7-11-97				X	
OWT06401	ME226001	TB	water	7-14-97	X				
OWT06401DL	ME226001DL		water	7-14-97	X				
OWG00401	ME226002		water	7-14-97	X	X	X	X	X
OWG00201	ME226003		water	7-15-97	X	X	X	X	X
OWG00502MS	ME149004MS	MS	water	7-8-97	X	X	X	X	X
OWG00502MSD	ME149004MSD	MSD	water	7-8-97	X	X	X		
OWG00502DUP	ME149004DUP	DUP	water	7-8-97				X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF046 **VALIDATION SAMPLE TABLE** **LDC#:** 2377A

Project Name: NAS Whiting Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)	SVOA (1.9)	Pesticides /PCBs (1.9)	Metals (4.0)	Cyanide
OWT06501	ME241001	TB	water	7-15-97	X				
31R03301	ME241002	R	water	7-15-97	X	X	X	X	X
31G00101	ME241003		water	7-15-97	X	X	X	X	X
31G00101D	ME241004	FD	water	7-15-97	X	X	X	X	X
OWT06601	ME261001	TB	water	7-16-97	X				
31G00401	ME261002		water	7-16-97	X	X	X	X	X
31G00402	ME261003		water	7-16-97	X				
31G00403	ME261004		water	7-16-97	X				
31G00301	ME261005		water	7-16-97	X				
31T06701	ME305001	TB	water	7-21-97	X				
31G00201	ME305002		water	7-21-97	X				
31G00101MS	ME241003MS	MS	water	7-15-97	X	X	X	X	
31G00101MSD	ME241003MSD	MSD	water	7-15-97	X	X	X		
31G00101DUP	ME241003DUP	DUP	water	7-15-97				X	

= Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

SDG#: WF047 | VALIDATION SAMPLE TABLE | LDC#: 2346A

Project Name: NAS Whiting

Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA OLV01.0	Metals (2.1)
39W028	ME243001		water	7-15-97	X	
39W027	ME243002		water	7-15-97	X	
39W024	ME243003		water	7-15-97	X	
39W032	ME243004		water	7-15-97	X	X
39W034	ME243005		water	7-15-97	X	X
39W034D	ME243006		water	7-15-97	X	X
39W031	ME243007		water	7-15-97	X	
STOR_BLK	ME243008		water	7-17-97	X	
39T10001	ME244001	TB	water	7-15-97	X	
39W001	ME244002		water	7-15-97	X	
39W002	ME244003		water	7-15-97	X	X
39W003	ME244004		water	7-15-97	X	
39W004	ME244005		water	7-15-97	X	
39W005	ME244006		water	7-15-97	X	
39W006	ME244007		water	7-15-97	X	
39W007	ME244008		water	7-15-97	X	
39W008	ME244009		water	7-15-97	X	
39W014	ME267001		water	7-16-97	X	
39W015	ME267002		water	7-16-97	X	
39W016	ME267003		water	7-16-97	X	X
39W012	ME267004		water	7-16-97	X	
39W012D	ME267005	FD	water	7-16-97	X	
39W013	ME267006		water	7-16-97	X	
39W017	ME267007		water	7-16-97	X	

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF047 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2346A

Project Name: NAS Whiting

Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA OLV01.0	Metals (2.1)
STOR_BLK2	ME267008		water	7-18-97	X	
39W034MS	ME243005MS	MS	water	7-15-97	X	X
39W034MSD	ME243005MSD	MSD	water	7-15-97	X	
39W034DUP	ME243005DUP	DUP	water	7-15-97		X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

SDG#: WF048 | **VALIDATION SAMPLE TABLE** | **C#:** 2338A

Project Name: NAS Whiting

Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)
39D002	ME245001		soil	7-15-97	X
39D001	ME245002		soil	7-15-97	X
39D007	ME245003		soil	7-15-97	X
39D023	ME264001		soil	7-16-97	X
39D026	ME264002		soil	7-16-97	X
39D016	ME264003		soil	7-16-97	X
39D013	ME264004		soil	7-16-97	X
39D019	ME264005		soil	7-17-97	X
39D018	ME264006		soil	7-17-97	X
39D018D	ME264007	FD	soil	7-17-97	X
39D022	ME264008		soil	7-17-97	X
39R03401	ME264009	R	water	7-16-97	X
39D018MS	ME264006MS	MS	soil	7-17-97	X
39D018MSD	ME264006MSD	MSD	soil	7-17-97	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF049 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2347A

Project Name: NAS Whiting | Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)	SVOA (1.9)
39T10201	ME262001	TB	water	7-15-97	X	
39W023	ME262002		water	7-16-97	X	
39W026	ME262003		water	7-16-97	X	
39W025	ME262004		water	7-16-97	X	
39W029	ME262005		water	7-16-97	X	
39W030	ME262006		water	7-16-97	X	
39U001	ME262007		water	7-16-97	X	X
39W018	ME263001		water	7-17-97	X	
39W019	ME263002		water	7-17-97	X	
39W020	ME263003		water	7-17-97	X	
39W021	ME263004		water	7-17-97	X	
39W021D	ME263005	FD	water	7-17-97	X	
39W022	ME263006		water	7-17-97	X	
39T10401	ME263007	TB	water	7-17-97	X	
39W021MS	ME263004MS	MS	water	7-17-97	X	
39W021MSD	ME263004MSD	MSD	water	7-17-97	X	

Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

LDC#: 2360A

VALIDATION SAMPLE TABLE

SDG#: WF051

Project Name: NAS Whiting

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	Parameters/Analytical Method: VOA (1,9)	Metals (CLP)
16T06801	ME306001	TB	water	7-21-97	X	
16R03501	ME306002	R	water	7-21-97	X	
16G00401	ME306003		water	7-22-97	X	
16G00401D	ME306004	FD	water	7-22-97	X	
16G00402	ME306005		water	7-22-97	X	
16G00403	ME306006		water	7-22-97	X	
16T06901	ME322001	TB	water	7-22-97	X	X
16G00302	ME322002		water	7-22-97	X	X
16G00303	ME322003		water	7-22-97	X	X
16G00202	ME322004		water	7-23-97	X	X
16G00203	ME322005		water	7-23-97	X	
16T07001	ME340001	TB	water	7-23-97	X	X
16G00601	ME340002		water	7-23-97	X	X
16G00601F	ME340003		water	7-23-97		X
16G00602	ME340004		water	7-23-97	X	X
16R03601	MW340005	R	water	7-23-97		X
16G00304	ME340006		water	7-24-97	X	X
16G00304F	ME340007		water	7-24-97		X
16G00301	ME340008		water	7-24-97	X	X
16G00101	ME340009		water	7-24-97	X	X
16G00101D	ME340010	FD	water	7-24-97	X	
16T07101	ME348001	TB	water	7-25-97	X	X
16G00702	ME348002		water	7-25-97	X	
16G00702DL	ME348002DL		water	7-25-97	X	

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF051 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2360A

Project Name: NAS Whiting | Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)	Metals (CLP)
16G00703	ME348003		water	7-25-97	X	X
16G00703DL	ME348003DL		water	7-25-97	X	
16G00701	ME348004		water	7-25-97	X	X
16G00401MS	ME306003MS	MS	water	7-22-97	X	
16G00401MSD	ME306003MSD	MSD	water	7-22-97	X	

= Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

SDG#: WF052 | VALIDATION SAMPLE TABLE | **DC#:** 2354A

Project Name: NAS Whiting | Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (OLV01.0)
39018	ME346001		water	7-25-97	X
39019	ME346002		water	7-25-97	X
39020	ME346003		water	7-25-97	X
39021	ME346004		water	7-25-97	X
39020D	ME346005	FD	water	7-25-97	X
39029	ME346006		water	7-25-97	X
39T10501	ME346007	TB	water	7-25-97	X
STORAGEBLK	ME346008		water	7-26-97	X
39020MS	ME346003MS	MS	water	7-25-97	X
39020MSD	ME346003MSD	MSD	water	7-25-97	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

LDC#: 2384A

VALIDATION SAMPLE TABLE

SDG#: WF053

Project Name: NAS Whiting

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	Parameters/Analytical Method VOA (1.9)	Metals (2.1)
15T07201	ME367001	TB	water	7-27-97	X	
15R03701	ME367002	R	water	7-27-97	X	X
15G00601	ME367003		water	7-27-97	X	X
15G00602	ME367004		water	7-27-97	X	X
15G00602D	ME367005	FD	water	7-27-97	X	X
15T07301	ME377001	TB	water	7-28-97	X	
15G00201	ME377002		water	7-28-97	X	X
15G00101	ME377003		water	7-28-97	X	X
15G00202	ME377004		water	7-29-97	X	X
15G00203	ME377005		water	7-29-97	X	X
15T07401	ME390001	TB	water	7-29-97	X	
15G00301	ME390002		water	7-29-97	X	X
15G00302	ME390003		water	7-29-97	X	X
15G00701	ME390004		water	7-30-97	X	X
15G00702	ME390005		water	7-30-97	X	X
15T07501	ME404001	TB	water	7-30-97	X	
15G00401	ME404002		water	7-30-97	X	X
15G00703	ME404003		water	7-30-97	X	X
15G00703D	ME404004	FD	water	7-30-97	X	X
15G00501	ME404005		water	7-31-97	X	X
15G00501F	ME404006		water	7-31-97		X
15G00502	ME404007		water	7-31-97	X	X
15G00503	ME404008		water	7-31-97	X	X
15G00602MS	ME367004MS	MS	water	7-27-97	X	X

= Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

SDG#: WF053 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2384A

Project Name: NAS Whiting

Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)	Metals (2.1)
15G00602MSD	ME367004MSD	MSD	water	7-27-97	X	
15G00602DUP	ME367004DUP	DUP	water	7-27-97		X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF054 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2399A

Project Name: NAS Whiting | Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)	Metals (2.1)
15T07601	ME441001	TB	water	8-4-97	X	
15G00801	ME441002		water	8-4-97	X	X
15G00801D	ME441003	FD	water	8-4-97	X	X
15G00802	ME441004		water	8-4-97	X	X
15R03801	ME441005	R	water	8-5-97	X	X
15G00803	ME441006		water	8-5-97	X	X
15G00303	ME441007		water	8-5-97	X	X
30T07701	ME450001	TB	water	8-5-97	X	
30R03901	ME450002	R	water	8-6-97	X	X
30G00302	ME450003		water	8-6-97	X	X
15G00801MS	ME441002MS	MS	water	8-4-97	X	X
15G00801MSD	ME441002MSD	MSD	water	8-4-97	X	
15G00801DUP	ME441002DUP	DUP	water	8-4-97		X

= Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

T

SDG#: WF055 | **VALIDATION SAMPLE TABLE** | **DC#:** 2511A

Project Name: NAS Whiting

					Parameters/Analytical Method
Client ID #	**Lab ID #**	**QC Type**	**Matrix**	**Date Collected**	**VOA (1.9)**
OWT08001	MF004001	TB	water	10-27-97	X
OWR04101	MF004002	R	water	10-27-97	X
OWG00401	MF004003		water	10-27-97	X
OWG00401D	MF004004		water	10-27-97	X
13R04201	MF004005	R	water	10-28-97	X
13G00401	MF004006		water	10-28-97	X
OWG00401MS	MF004003MS	MS	water	10-27-97	X
OWG00401MSD	MF004003MSD	MSD	water	10-27-97	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table II
Summary of Rejected Data (Organics)
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Fraction	Sample	Compound	Reason
WF022	Volatiles Semivolatiles Pesticides & PCBS	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF023	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF024	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF025	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF026	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF027	Volatiles Semivolatiles Pesticides & PCBs	16G00501 16G00501D 16R01501 66G02101 66G02103 66T02001 All samples All samples	2-Butanone 2-Butanone 2-Butanone 2-Butanone 2-Butanone 2-Butanone No rejected results No rejected results	Initial & Continuing Calibration (RRF) - -
WF028	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF029	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF030	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF031	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF031B	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF032	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples 29G00501 29G00501D	No rejected results No rejected results Heptachlor epoxide Heptachlor epoxide	- - Target compound identification (RT)
WF033	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF034	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF035	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -

Table II
Summary of Rejected Data (Organics)
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Fraction	Sample	Compound	Reason
WF036	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF037	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF038	Volatiles	All samples	No rejected results	-
WF039	Volatiles	All samples	No rejected results	-
WF040	Volatiles	All samples	No rejected results	-
WF041	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF042	Volatiles	All samples	No rejected results	-
WF043	Volatiles	All samples	No rejected results	-
WF044	Volatiles	All samples	No rejected results	-
WF045	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF046	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF047	Volatiles	39T10001 39W001 39W002 39W003 39W004 39W005 39W006 39W007 39W008 39W012 39W012D 39W013 39W014 39W015 39W016 39W017 39W024 39W027 39W028 39W031 39W032 39W034 39W034D STOR_BLK STOR_BLK2	Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone 2-Butanone 2-Butanone 2-Butanone 2-Butanone Acetone & 2-Butanone 2-Butanone Acetone & 2-Butanone 2-Butanone 2-Butanone	Initial & Continuing Calibration (RRF)
WF048	Volatiles	All samples	No rejected results	-

Table II
Summary of Rejected Data (Organics)
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Fraction	Sample	Compound	Reason
WF049	Volatiles	39T10201 39T10401 39W016 39W019 39W020 39W021 39W021D 39W022 39W023 39W025 39W026 39W029 39W030	Acetone & 2-Butanone Acetone & 2-Butanone Acetone 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone 2-Butanone 2-Butanone	Initial & Continuing calibration (RRF)
WF049	Semivolatiles	All samples	No rejected results	-
WF051	Volatiles	All samples	No rejected results	-
WF052	Volatiles	39G018 39G019 39G020 39G020D 39G021 39G029 39R10501 STORAGE BLK	Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone	Initial & Continuing Calibration (RRF)
WF053	Volatiles	All samples	No rejected results	-
WF054	Volatiles	All samples	No rejected results	-
WF055	Volatiles	All samples	No rejected results	-

Table III
Summary of Rejected Data (Inorganics)
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Fraction	Sample	Analyte	Reason
WF022	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF023	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF024	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF025	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF026	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF027	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF028	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF029	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF030	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF031	All metals Cyanide	All samples 05G00101 05G00301 05G00801 05G00802 05G00901 05G00902 05G01001 05G01001D 05G01002 05R01901 33G00101 33G00201 33G00301 33G00301D 33G00501	No rejected results Cyanide Cyanide Cyanide Cyanide Cyanide Cyanide Cyanide Cyanide Cyanide Cyanide Cyanide Cyanide Cyanide Cyanide Cyanide	- Matrix spike (%R)
WF031B	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF032	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF033	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF034	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF035	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF036	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF037	All metals Cyanide	All samples 15F00201	No rejected results Cyanide	- Matrix spike (%R)
WF041	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -

Table III
Summary of Rejected Data (Inorganics)
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes				
SDG	**Fraction**	**Sample**	**Analyte**	**Reason**
WF045	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF046	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF047	All metals	All samples	No rejected results	-
WF051	All metals	All samples	No rejected results	-
WF053	All metals	All samples	No rejected results	-
WF054	All metals	All samples	No rejected results	-

Table IV
Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike/Matrix Spike Duplicates
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Criteria		% Recovery		RPD	Qualifier
			% Recovery	RPD	MS	MSD		
WF022	BKG00101	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		4-Chloro-3-methylphenol	23-97	-	108	115	-	J (all detects)
		4-Nitrophenol	10-80	-	88	93	-	J (all detects)
		2,4-Dinitrotoluene	24-96	-	100	108	-	J (all detects)
		Pentachlorophenol	9-103	-	106	118	-	J (all detects)
		Pesticides/PCBs	-	-	-	-	-	None
WF023	02G00301	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		4-Nitrophenol	10-80	-	88	82	-	J (all detects)
		2,4-Dinitrotoluene	24-96	-	97	-	-	J (all detects)
		Pentachlorophenol	9-103	-	139	122	-	J (all detects)
		Pesticides/PCBs	-	-	-	-	-	None
WF024	15G00701	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		4-Nitrophenol	10-80	-	100	102	-	J (all detects)
		2,4-Dinitrotoluene	24-96	-	102	106	-	J (all detects)
		Pentachlorophenol	9-103	-	147	148	-	J (all detects)
		Pesticides/PCBs	-	-	-	-	-	None
WF025	15G00601	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		4-Nitrophenol	10-80	-	99	102	-	J (all detects)
		2,4-Dinitrotoluene	24-96	-	101	103	-	J (all detects)
		Pentachlorophenol	9-103	-	124	130	-	J (all detects)
		Pesticides/PCBs	-	-	-	-	-	None

Table IV
Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike/Matrix Spike Duplicates
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Criteria		% Recovery		RPD	Qualifier
			% Recovery	RPD	MS	MSD		
WF026	15G00803	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		4-Chloro-3-methylphenol	23-97	-	99	-	-	J (all detects)
		4-Nitrophenol	10-80	-	108	114	-	J (all detects)
		Pentachlorophenol	9-103	-	140	144	-	J (all detects)
		2,4-Dinitrotoluene	24-96	-	-	100	-	J (all detects)
		Pesticides/PCBs	-	-	-	-	-	None
WF027	16G00501	Volatiles						
		Benzene	-	≤11	-	-	12	J
		Semivolatiles						
		4-Nitrophenol	10-80	-	91	91	-	J (all detects)
		Pentachlorophenol	9-103	-	104	104	-	J (all detects)
		Pesticides/PCBs	-	-	-	-	-	None
WF028	12G00101	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		4-Nitrophenol	10-80	-	83	-	-	J (all detects)
		Pesticides/PCBs	-	-	-	-	-	None
WF029	14G00101	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		4-Nitrophenol	10-80	-	88	91	-	J (all detects)
		Pentachlorophenol	9-103	-	-	106	-	J (all detects)
		Pesticides/PCBs	-	-	-	-	-	None
WF030	66G00601	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		4-Nitrophenol	10-80	-	85	89	-	J (all detects)
		Pesticides/PCBs	-	-	-	-	-	None

Table IV
Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike/Matrix Spike Duplicates
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Criteria		% Recovery		RPD	Qualifier
			% Recovery	RPD	MS	MSD		
WF031	05G01001	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		Phenol	-	≤42	-	-	50	None
		2-Chlorophenol	-	≤40	-	-	50	None
		4-Chloro-3-methylphenol	-	≤42	-	-	51	None
		4-Nitrophenol	10-80	≤50	-	95	58	None
		Pentachlorophenol	-	≤50	-	-	52	None
		1,4-Dichlorobenzene	-	≤28	-	-	45	J
		N-Nitroso-di-n-propylamine	-	≤38	-	-	56	J
		1,2,4-Trichlorobenzene	-	≤28	-	-	41	J
		Acenaphthene	-	≤31	-	-	84	J
		2,4-Dinitrotoluene	-	≤38	-	-	52	J
		Pyrene	-	≤31	-	-	54	J
		Pesticides/PCBs	-	-	-	-	-	None
WF031B	None	Volatiles	-	-	-	-	-	-
		Semivolatiles	-	-	-	-	-	-
		Pesticides/PCBs	-	-	-	-	-	-
WF032	29G00501	Volatiles	-	-	-	-	-	None
		Semivolatiles	-	-	-	-	-	None
		Pesticides/PCBs	-	-	-	-	-	None
WF033	66G00201	Volatiles						
		1,1-Dichloroethene	-	≤14	-	-	16	None
		Semivolatiles						
		4-Nitrophenol	10-80	-	-	83	-	None
		Pesticides & PCBs	-	-	-	-	-	None
WF034	30G00301	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		Acenaphthene	46-118	≤31	44	-	37	None
		1,4-Dichlorobenzene	-	≤28	-	-	33	None
		1,2,4-Trichlorobenzene	-	≤28	-	-	34	None
		2,4-Dinitrotoluene	-	≤38	-	-	40	None
		Pyrene	-	≤31	-	-	36	None

Table IV
Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike/Matrix Spike Duplicates
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Criteria		% Recovery		RPD	Qualifier
			% Recovery	RPD	MS	MSD		
WF034 cont.	30G00301	Pesticides/PCBs	-	-	-	-	-	None
WF035	66G01701	Volatiles	-	-	-	-	-	None
		Semivolatiles	-	-	-	-	-	None
		Pesticides/PCBs	-	-	-	-	-	None
WF036	54G00101	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		4-Nitrophenol	10-80	-	101	81	-	None
		1,4-Dichlorobenzene	-	≤28	-	-	30	J
		1,2,4-Trichlorobenzene	-	≤28	-	-	36	J
		Pesticides/PCBs	-	-	-	-	-	None
WF037	15G00803	Volatiles	-	-	-	-	-	None
WF038	36BO0303	Volatiles	-	-	-	-	-	None
WF039	35BO0203	Volatiles	-	-	-	-	-	None
WF040	37BO0203	Volatiles	-	-	-	-	-	None
WF041	35G00101	Volatiles	-	-	-	-	-	None
		Semivolatiles	-	-	-	-	-	None
		Pesticides & PCBs						
		Aldrin	40-120	-	124	121	-	J (all detects)
WF042	05G00902	Volatiles	-	-	-	-	-	None
WF043	05G00802	Volatiles	-	-	-	-	-	None
WF044	66G01201	Volatiles						
		Trichloroethene	-	≤14	-	-	40	None
WF045	OWG00502	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		4-Nitrophenol	10-80	-	96	109	-	J (all detects)
		2,4-Dinitrotoluene	24-96	-	-	100	-	J (all detects)

Table IV
Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike/Matrix Spike Duplicates
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Criteria		% Recovery		RPD	Qualifier
			% Recovery	RPD	MS	MSD		
WF045 cont.	OWG00502	Pesticides & PCBs						
		gamma-BHC	-	≤15	-	-	28	J
		Heptachlor	-	≤20	-	-	24	J
		Aldrin	40-120	≤22	-	128	29	J
		Dieldrin	52-126	≤18	-	134	22	J
		Endrin	56-121	≤21	-	144	22	J
WF046	31G00101	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		4-Nitrophenol	10-80	-	88	96	-	J (all detects)
		Pesticides & PCBs						
		Endrin	56-121	-	127	-	-	J (all detects)
WF047	39W034	Volatiles	-	-	-	-	-	None
WF048	39D018	Volatiles	-	-	-	-	-	None
WF049	39W021	Volatiles	-	-	-	-	-	None
	None	Semivolatiles	-	-	-	-	-	None
WF051	16G00401	Volatiles	-	-	-	-	-	None
WF052	39020	Volatiles	-	-	-	-	-	None
WF053	15G00602	Volatiles	-	-	-	-	-	None
WF054	15G00801	Volatiles	-	-	-	-	-	None
WF055	13G00401	Volatiles	-	-	-	-	-	None

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF022	**Client ID**	BKG00101	BKG00101D	
	Laboratory ID	RB858003	RB858004	
	Collection Date	7/16/96	7/16/96	
	Acetone	ND	8 ug/L	Not calculable
	Semivolatiles	ND	ND	-
	Pesticides/PCBs	ND	ND	-
WF022	**Client ID**	01G00102	01G00102D	
	Laboratory ID	RB873008	RB873009	
	Collection Date	7/19/96	7/19/96	
	Acetone	4 ug/L	2 ug/L	67
	Semivolatiles	ND	ND	-
	Pesticides/PCBs	ND	ND	-
WF023	**Client ID**	02G00301	02G00301D	
	Laboratory ID	RB887012	RB887013	
	Collection Date	7/24/96	7/24/96	
	Acetone	ND	10 ug/L	Not calculable
	Carbon disulfide	1 ug/L	ND	Not calculable
	Semivolatiles	ND	ND	-
	Pesticides/PCBs	ND	ND	-
WF024	**Client ID**	15G00701	15G00701D	
	Laboratory ID	RB920009	RB920010	
	Collection Date	7/31/96	7/31/96	
	Acetone	2	ND	Not calculable
	Semivolatiles	ND	ND	-
	Pesticides/PCBs	ND	ND	-
WF025	**Client ID**	15G00601	15G00601D	
	Laboratory ID	RB956006	RB956008	
	Collection Date	8/7/96	8/7/96	
	Acetone	5 ug/L	8 ug/L	46
	1,2-Dichloroethene (total)	1 ug/L	1 ug/L	0
	Chlorobenzene	5 ug/L	5 ug/L	0
	Ethylbenzene	10U ug/L	1 ug/L	Not calculable
	1,4-Dichlorobenzene	12 ug/L	12 ug/L	0
	Naphthalene	4 ug/L	4 ug/L	0
	Diethylphthalate	1 ug/L	1 ug/L	0
	Pesticides/PCBs	ND	ND	-
WF026	**Client ID**	15G00803	15G00803D	
	Laboratory ID	RB980007	RB980008	
	Collection Date	8/14/96	8/14/96	
	Acetone	25 ug/L	5 ug/L	133
	2-Butanone	7 ug/L	10U ug/L	Not calculable
	Trichloroethene	4 ug/L	4 ug/L	0
	Bis(2-ethylhexyl)phthalate	2 ug/L	1 ug/L	67
	4,4'-DDT	0.16 ug/L	0.079 ug/L	68

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF026	**Client ID**	**16G00403**	**16G00403D**	
	Laboratory ID	**RB980020**	**RB980021**	
	Collection Date	**8/16/96**	**8/16/96**	
	Acetone	3 ug/L	2 ug/L	40
	1,2-Dichloroethene (total)	1 ug/L	2 ug/L	67
	Benzene	600 ug/L	600 ug/L	0
	Phenol	8 ug/L	8 ug/L	0
	Naphthalene	1 ug/L	2 ug/L	67
	Bis(2-ethylhexyl)phthalate	1 ug/L	10U ug/L	Not calculable
	Pesticides/PCBs	ND	ND	None
WF026	**Client ID**	**16G00403DL**	**16G00403DDL**	
	Laboratory ID	**RB980020DL**	**RB9890021DL**	
	Collection Date	**8/16/96**	**8/16/96**	
	Acetone	18 ug/L	24 ug/L	29
	Benzene	700 ug/L	740 ug/L	6
WF027	**Client ID**	**16G00501**	**16G00501D**	
	Laboratory ID	**RC016009**	**RC016013**	
	Collection Date	**8/21/96**	**8/21/96**	
	Volatiles	ND	ND	None
	Bis(2-ethylhexyl)phthalate	2 ug/L	10U ug/L	Not calculable
	Pesticides/PCBs	ND	ND	None
WF027	**Client ID**	**09G00301**	**09G00301D**	
	Laboratory ID	**RC016019**	**RC016020**	
	Collection Date	**8/23/96**	**8/23/96**	
	Acetone	46 ug/L	18 ug/L	88
	2-Butanone	2 ug/L	10U ug/L	Not calculable
	Semivolatiles	ND	ND	None
	Pesticides/PCBs	ND	ND	None
WF028	**Client ID**	**11G00201**	**11G00201D**	
	Laboratory ID	**RC044011**	**RC044018**	
	Collection Date	**8/28/96**	**8/28/96**	
	Acetone	5 ug/L	11 ug/L	75
	Phenol	4 ug/L	6 ug/L	40
	Bis(2-ethylhexyl)phthalate	5 ug/L	4 ug/L	22
	Pesticides/PCBs	ND	ND	None
WF028	**Client ID**	**12G00101**	**12G00101D**	
	Laboratory ID	**RC044012**	**RC044017**	
	Collection Date	**8/27/96**	**8/27/96**	
	Acetone	3 ug/L	6 ug/L	67
	Bis(2-ethylhexyl)phthalate	2 ug/L	2 ug/L	0
	Pesticides/PCBs	ND	ND	None

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF029	**Client ID**	**14G00101**	**14G00101D**	
	Laboratory ID	**RC092007**	**RC092009**	
	Collection Date	**9/11/96**	**9/11/96**	
	Acetone	8 ug/L	4 ug/L	67
	Carbon disulfide	3 ug/L	10U ug/L	Not calculable
	Methylene chloride	1 ug/L	10U ug/L	Not calculable
	Bis(2-ethylhexyl)phthalate	4 ug/L	4 ug/L	0
	Pesticides/PCBs	ND	ND	None
WF030	**Client ID**	**66G00601**	**66G00601D**	
	Laboratory ID	**RC121007**	**RC121011**	
	Collection Date	**9/18/96**	**9/18/96**	
	Acetone	2 ug/L	8 ug/L	120
	Methylene chloride	2 ug/L	10U ug/L	Not calculable
	Bis(2-ethylhexyl)phthalate	2 ug/L	3 ug/L	40
	Pesticides/PCBs	ND	ND	None
WF030	**Client ID**	**66G02203**	**66G02203D**	
	Laboratory ID	**RC121016**	**RC121017**	
	Collection Date	**9/20/96**	**9/20/96**	
	Acetone	4 ug/L	10U ug/L	Not calculable
	Bis(2-ethylhexyl)phthalate	2 ug/L	10U ug/L	Not calculable
	Pesticides/PCBs	ND	ND	None
WF031	**Client ID**	**05G01001**	**05G01001D**	
	Laboratory ID	**MB928007**	**MB928012**	
	Collection Date	**9/25/96**	**9/25/96**	
	Volatiles	ND	ND	None
	Semivolatiles	ND	ND	None
	Pesticides/PCBs	ND	ND	None
WF031	**Client ID**	**33G00301**	**33G00301D**	
	Laboratory ID	**MB958006**	**MB958007**	
	Collection Date	**9/27/96**	**9/27/96**	
	1,1-Dichloroethene	5 ug/L	6 ug/L	18
	1,2-Dichloroethene (total)	4 ug/L	3 ug/L	29
	Trichloroethene	300 ug/L	300 ug/L	0
	Di-n-butylphthalate	1 ug/L	1 ug/L	0
	Pesticides/PCBs	ND	ND	None

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF032	**Client ID**	29G00501	29G00501D	
	Laboratory ID	MC011007	MC011008	
	Collection Date	10/2/96	10/2/96	
	Volatiles	ND	ND	None
	Semivolatiles	ND	ND	None
	Pesticides/PCBs	ND	ND	None
WF033	**Client ID**	66G00201	66G00201D	
	Laboratory ID	MC118002	MC118003	
	Collection Date	10/9/96	10/9/96	
	Trichloroethene	1 ug/L	1 ug/L	0
	Toluene	1 ug/L	1 ug/L	0
	Semivolatiles	ND	ND	None
	Pesticides/PCBs	ND	ND	None
WF034	**Client ID**	30G00301	30G00301D	
	Laboratory ID	MC153005	MC153008	
	Collection Date	10/16/96	10/16/96	
	1,2-Dichloroethene (total)	31 ug/L	31 ug/L	0
	Trichloroethene	340 ug/L	340 ug/L	0
	Di-n-butylphthalate	2 ug/L	10U ug/L	Not calculable
	Pesticides/PCBs	ND	ND	None
WF035	**Client ID**	66G01701	66G01701D	
	Laboratory ID	MC214005	MC214007	
	Collection Date	10/23/96	10/23/96	
	Volatiles	ND	ND	None
	Di-n-butylphthalate	3 ug/L	2 ug/L	40
	Pesticides/PCBs	ND	ND	None
WF036	**Client ID**	54G00101	54G00101D	
	Laboratory ID	MC262004	MC262008	
	Collection Date	10/30/96	10/30/96	
	Volatiles	ND	ND	None
	Diethylphthalate	1 ug/L	10U ug/L	Not calculable
	Di-n-butylphthalate	1 ug/L	10U ug/L	Not calculable
	Pesticides/PCBs	ND	ND	None
WF037	**Client ID**	15G00803	15G00803D	
	Laboratory ID	MC424007	MC424008	
	Collection Date	11/20/96	11/20/96	
	Trichloroethene	5 ug/L	5 ug/L	0
WF038	**Client ID**	36BO0303	36BO0303D	
	Laboratory ID	MC687010	MC687011	
	Collection Date	12/17/96	12/17/96	
	Volatiles	ND	ND	None

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF038	**Client ID**	36BO0403	36BO0403D	
	Laboratory ID	MC687014	MC687015	
	Collection Date	12/18/96	12/18/96	
	Volatiles	ND	ND	None
WF039	**Client ID**	35BO0302	35BO0302D	
	Laboratory ID	MC698013	MC698015	
	Collection Date	12/21/96	12/21/96	
	Volatiles	ND	ND	None
WF039	**Client ID**	35BO0203	35BO0203D	
	Laboratory ID	MC698010	MC698016	
	Collection Date	12/21/96	12/21/96	
	Volatiles	ND	ND	None
WF040	**Client ID**	37BO0203	37BO0203D	
	Laboratory ID	MC783010	MC783018	
	Collection Date	1/8/97	1/8/97	
	Acetone	14 ug/Kg	12 ug/Kg	15
	Methylene chloride	2 ug/Kg	10 ug/Kg	133
WF040	**Client ID**	37BO0103	37BO0103D	
	Laboratory ID	MC783013	MC783019	
	Collection Date	1/8/97	1/8/97	
	Acetone	18 ug/Kg	22 ug/Kg	20
	Methylene chloride	3 ug/Kg	11 ug/Kg	114
WF041	**Client ID**	35G00101	35G00101D	
	Laboratory ID	MD908004	MD908005	
	Collection Date	6/11/97	6/11/97	
	Volatiles			
	1,1-Dichlcroethene	6 ug/L	7 ug/L	15
	1,1,1-Trichloroethane	2 ug/L	2 ug/L	0
	Xylene (total)	2 ug/L	1 ug/L	67
	Semivolatiles	ND	ND	-
	Pesticides & PCBs	ND	ND	-
WF041	**Client ID**	35G00202	35G00202D	
	Laboratory ID	MD950002	MD950003	
	Collection Date	6/15/97	6/15/97	
	Volatiles			
	Chloroform	3 ug/L	3 ug/L	0
	Semivolatiles			
	Bis(2-ethylhexyl)phthalate	10U ug/L	5 ug/L	Not calculable
	Pesticides & PCBs	ND	ND	-
WF042	**Client ID**	05G00902	05G00902D	
	Laboratory ID	ME007004	ME007005	
	Collection Date	6/19/97	6/19/97	
	Volatiles	ND	ND	-

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF043	**Client ID**	**05G00802**	**05G00802D**	
	Laboratory ID	**ME042004**	**ME042005**	
	Collection Date	**6/24/97**	**6/24/97**	
	Volatiles			
	Benzene	1 ug/L	10U ug/L	Not calculable
	Trichloroethene	4 ug/L	10U ug/L	Not calculable
	Xylenes (total)	1 ug/L	10U ug/L	Not calculable
WF043	**Client ID**	**07G00101**	**07G00101D**	
	Laboratory ID	**ME087002**	**ME087003**	
	Collection Date	**6/26/97**	**6/26/97**	
	Acetone	540 ug/L	490 ug/L	10
	Benzene	3900 ug/L	4400 ug/L	12
	Toluene	14000 ug/L	16000 ug/L	13
	Ethylbenzene	1800 ug/L	2000 ug/L	10
	Xylenes, total	3200 ug/L	3600 ug/L	12
WF044	**Client ID**	**66G01201**	**66G01201D**	
	Laboratory ID	**ME110002**	**ME110003**	
	Collection Date	**6/30/97**	**6/30/97**	
	Volatiles			
	1,1-Dichloroethene	3 ug/L	2 ug/L	40
	1,2-Dichloroethene (total)	3 ug/L	3 ug/L	0
	Trichloroethene	120 ug/L	96 ug/L	22
WF044	**Client ID**	**66G00603**	**66G00603D**	
	Laboratory ID	**ME135002**	**ME135003**	
	Collection Date	**7/2/97**	**7/2/97**	
	Volatiles			
	Trichloroethene	1 ug/L	1 ug/L	0
WF045	**Client ID**	**OWG00502**	**OWG00502D**	
	Laboratory ID	**ME149004**	**ME149005**	
	Collection Date	**7/8/97**	**7/8/97**	
	Volatiles			
	Acetone	3 ug/Kg	2 ug/Kg	40
	Semivolatiles	ND	ND	-
	Pesticides & PCBs	ND	ND	-
WF045	**Client ID**	**OWG00302**	**OWG00302D**	
	Laboratory ID	**ME190002**	**ME190003**	
	Collection Date	**7/10/97**	**7/10/97**	
	Volatiles	ND	ND	-
	Pesticides & PCBs	ND	ND	-
	Semivolatiles			
	Di-n-butylphthalate	4 ug/L	6 ug/L	40
WF046	**Client ID**	**31G00101**	**31G00101D**	
	Laboratory ID	**ME241003**	**ME241004**	
	Collection Date	**7/15/97**	**7/15/97**	
	Volatiles	ND	ND	-
	Pesticides & PCBs	ND	ND	-
	Semivolatiles			
	Di-n-butylphthalate	6 ug/L	3 ug/L	67

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF047	**Client ID**	39W034	39W034D	
	Laboratory ID	ME243005	ME243006	
	Collection Date	7/15/97	7/15/97	
	Volatiles			
	Acetone	4 ug/L	5U ug/L	Not calculable
	Carbon disulfide	1U ug/L	1 ug/L	Not calculable
WF047	**Client ID**	39W012	39W012D	
	Laboratory ID	ME267004	ME267005	
	Collection Date	7/16/97	7/16/97	
	Volatiles			
	Methylene chloride	2U ug/L	1 ug/L	Not calculable
	Benzene	2 ug/L	2 ug/L	0
WF048	**Client ID**	39D018	39D018D	
	Laboratory ID	ME264006	ME264007	
	Collection Date	7/17/97	7/17/97	
	Volatiles			
	Acetone	27 ug/Kg	27 ug/Kg	0
	Trichloroethene	2 ug/Kg	2 ug/Kg	0
WF049	**Client ID**	39W021	39W021D	
	Laboratory ID	ME263004	ME263005	
	Collection Date	7/17/97	7/17/97	
	Volatiles	ND	ND	-
WF051	**Client ID**	16G00401	16G00401D	
	Laboratory ID	ME306003	ME306003	
	Collection Date	7/22/97	7/22/97	
	Volatiles			
	Acetone	18 ug/L	14 ug/L	25
WF051	**Client ID**	16G00101	16G00101D	
	Laboratory ID	ME340009	ME340010	
	Collection Date	7/24/97	7/24/97	
	Volatiles	ND	ND	-
WF052	**Client ID**	39020	39020D	
	Laboratory ID	ME346004	ME346005	
	Collection Date	7/25/97	7/25/97	
	Volatiles	ND	ND	-
WF053	**Client ID**	15G00602	15G00602D	
	Laboratory ID	ME367004	ME367005	
	Collection Date	7/27/97	7/27/97	
	Volatiles			
	Trichloroethene	2 ug/L	2 ug/L	0
WF053	**Client ID**	15G00703	15G00703D	
	Laboratory ID	ME404003	ME404004	
	Collection Date	7/30/97	7/30/97	
	Volatiles			
	1,2-Trichloroethene (total)	1 ug/L	2 ug/L	67
	Trichloroethene	36 ug/L	38 ug/L	5
	1,1-Dichloroethene	2 ug/L	10U ug/L	Not calculable

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF054	**Client ID**	**15G00801**	**15G00801D**	
	Laboratory ID	**ME441002**	**ME441003**	
	Collection Date	**8/4/97**	**8/4/97**	
	Volatiles			
	Chlorobenzene	4 ug/L	4 ug/L	0
WF055	**Client ID**	**OWG00401**	**OWG00401D**	
	Laboratory ID	**MF004003**	**MF004004**	
	Collection Date	**10/27/97**	**10/27/97**	
	Volatiles	ND	ND	-

Table VI
Summary of Surrogate Recoveries
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF022	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			10	
	BKR01001	Decachlorobiphenyl	58	60-150		J
		Decachlorobiphenyl	58	60-150		J
	BKG00101	Tetrachloro-m-xylene	59	60-150		J
		Tetrachloro-m-xylene	57	60-150		J
	BKG00102	Decachlorobiphenyl	37	60-150		J
		Decachlorobiphenyl	37	60-150		J
	BKG00103	Decachlorobiphenyl	40	60-150		J
		Decachlorobiphenyl	41	60-150		J
	BKG00202	Decachlorobiphenyl	47	60-150		J
		Decachlorobiphenyl	47	60-150		J
	BKG00201	Decachlorobiphenyl	43	60-150		J
		Decachlorobiphenyl	43	60-150		J
	BKF01001	Tetrachloro-m-xylene	59	60-150		J
		Tetrachloro-m-xylene	59	60-150		J
		Decachlorobiphenyl	51	60-150		J
		Decachlorobiphenyl	47	60-150		J
	17G00101	Decachlorobiphenyl	58	60-150		J
		Decachlorobiphenyl	56	60-150		J
	17G00201	Decachlorobiphenyl	22	60-150		J
		Decachlorobiphenyl	21	60-150		J
	01G00102D	Decachlorobiphenyl	59	60-150		J
		Decachlorobiphenyl	56	60-150		J
WF023	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			5	
	01G00201	Decachlorobiphenyl	32	60-150		J
		Decachlorobiphenyl	28	60-150		J
	01G00301	Decachlorobiphenyl	49	60-150		J
		Decachlorobiphenyl	47	60-150		J
	02G00101	Decachlorobiphenyl	41	60-150		J
		Decachlorobiphenyl	42	60-150		J
	16G00703	Decachlorobiphenyl	59	60-150		J
		Decachlorobiphenyl	55	60-150		J
	18G00301	Decachlorobiphenyl	48	60-150		J
		Decachlorobiphenyl	46	60-150		J

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Summary of Surrogate Recoveries
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF024	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			1	
	BKG00203	Decachlorobiphenyl	52	60-150	-	J
		Decachlorobiphenyl	48	60-150	-	J
WF025	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			5	
	15G00101	Decachlorobiphenyl	21	60-150		J
		Decachlorobiphenyl	20	60-150		J
	15G00303	Tetrachloro-m-xylene	57	60-150		J
		Tetrachloro-m-xylene	58	60-150		J
	15G00502	Tetrachloro-m-xylene	155	60-150		J (all detects)
		Tetrachloro-m-xylene	162	60-150		J (all detects)
	15R01301	Decachlorobiphenyl	59	60-150		J
	15G00502RE	Decachlorobiphenyl	53	60-150		J
		Decachlorobiphenyl	54	60-150		J
WF026	All	Volatiles	All within QC limits	-	-	None
		Semivolatiles			2	
	15G00802	2-Fluorobiphenyl	161	43-116		J (all detects) all B/N
		Terphenyl-d14	163	33-141		J (all detects) all B/N
	15G00802R	2-Fluorobiphenyl	182	43-116		J (all detects) all B/N
		Terphenyl-d14	153	33-141		J (all detects) all B/N

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Summary of Surrogate Recoveries
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF026 cont.		Pesticides/PCBs			9	
	15G00201	Decachlorobiphenyl	52	60-150		J
		Decachlorobiphenyl	50	60-150		J
	15G00202	Decachlorobiphenyl	58	60-150		J
		Decachlorobiphenyl	58	60-150		J
	15G00801	Decachlorobiphenyl	43	60-150		J
		Decachlorobiphenyl	38	60-150		J
	15G00803	Decachlorobiphenyl	58	60-150		J
		Decachlorobiphenyl	58	60-150		J
	16G00201	Decachlorobiphenyl	43	60-150		J
		Decachlorobiphenyl	37	60-150		J
	16G00203	Decachlorobiphenyl	44	60-150		J
		Decachlorobiphenyl	43	60-150		J
	16G00403	Decachlorobiphenyl	40	60-150		J
		Decachlorobiphenyl	39	60-150		J
	16G00403D	Decachlorobiphenyl	47	60-150		J
		Decachlorobiphenyl	46	60-150		J
	16G00601	Decachlorobiphenyl	25	60-150		J
		Decachlorobiphenyl	25	60-150		J
WF027	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			2	
	16G00304	Decachlorobiphenyl	46	60-150		J
		Decachlorobiphenyl	43	60-150		J
	66G02103	Decachlorobiphenyl	58	60-150		J
		Decachlorobiphenyl	58	60-150		J
WF028	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			5	
	10G00101	Decachlorobiphenyl	50	60-150		J
		Decachlorobiphenyl	48	60-150		J
	11G00101	Decachlorobiphenyl	47	60-150		J
		Decachlorobiphenyl	47	60-150		J
	11G00301	Decachlorobiphenyl	25	60-150		J
		Decachlorobiphenyl	24	60-150		J
	11G00401	Decachlorobiphenyl	29	60-150		J
		Decachlorobiphenyl	29	60-150		J
	11G00201D	Decachlorobiphenyl	59	60-150		J

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Summary of Surrogate Recoveries
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF029	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			3	
	13G00101	Decachlorobiphenyl	23	60-150		J
		Decachlorobiphenyl	23	60-150		J
	66G00901	Decachlorobiphenyl	43	60-150		J
		Decachlorobiphenyl	42	60-150		J
	66G00903	Decachlorobiphenyl	52	60-150		J
		Decachlorobiphenyl	52	60-150		J
WF030	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			1	
	66G00804	Decachlorobiphenyl	31	60-150		J
		Decachlorobiphenyl	31	60-150		J
WF031	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			3	
	05G00301	Tetrachloro-m-xylene	56	60-150		J
		Tetrachloro-m-xylene	52	60-150		J
	05G00101	Decachlorobiphenyl	164	60-150		J (all detects)
	05G01002	Tetrachloro-m-xylene	57	60-150		J
WF031B	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
	All	Pesticides/PCBs	All within QC limits	-	-	None
WF032	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			1	
	29G00101	Tetrachloro-m-xylene	54	60-150		J
		Tetrachloro-m-xylene	56	60-150		J

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Summary of Surrogate Recoveries
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF033	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			3	
	07G00101	Tetrachloro-m-xylene	174	60-150		J (all detects)
	30G00501	Tetrachloro-m-xylene	59	60-150		J
	66G00201D	Tetrachloro-m-xylene	25	60-150		J
		Tetrachloro-m-xylene	36	60-150		J
WF034	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			1	
	66G01801	Tetrachloro-m-xylene	164	60-150		J (all detects)
WF035	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			1	
	08G00101	Tetrachloro-m-xylene	59	60-150		J
WF036	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			1	
	54G00101	Tetrachloro-m-xylene	57	60-150		J
		Tetrachloro-m-xylene	52	60-150		J
WF037	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
	All	Pesticides/PCBs	All within QC limits	-	-	None
WF038	All	Volatiles	All within QC limits	-	-	None
WF039	All	Volatiles	All within QC limits	-	-	None
WF040	All	Volatiles	All within QC limits	-	-	None

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Summary of Surrogate Recoveries
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF041	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides & PCBs			2	
	35G00201	Decachlorobiphenyl	58	60-150		J
	36G00103	Tetrachloro-m-xylene	57	60-150		J
		Tetrachloro-m-xylene	58	60-150		J
WF042	All	Volatiles	-	-	-	None
WF043	All	Volatiles	-	-	-	None
WF044	All	Volatiles	-	-	-	None
WF045	All	Volatiles	-	-	-	None
		Semivolatiles			3	
	OWG00101	2-Fluorophenol	0	21-110		J (all detects)
		Phenol-d5	0	10-110		R (all non-detects)
		2-Chlorophenol-d4	0	33-110		
		1,2-Dichlorobenzene-d4	0	16-110		
		Nitrobenzene-d5	0	35-114		
		2-Fluorobiphenyl	0	43-116		
		2,4,6-Tribromophenol	0	10-123		
		Terphenyl-d14	0	33-141		
	OWG00102	2-Fluorophenol	0	21-110		J (all detects)
		Phenol-d5	0	10-110		R (all non-detects)
		2-Chlorophenol-d4	0	33-110		
		1,2-Dichlorobenzene-d4	0	16-110		
		Nitrobenzene-d5	0	35-114		
		2-Fluorobiphenyl	0	43-116		
		2,4,6-Tribromophenol	0	10-123		
		Terphenyl-d14	0	33-141		

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Summary of Surrogate Recoveries
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Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF045 cont.	OWG00103	2-Fluorophenol	0	21-110		J (all detects)
		Phenol-d5	0	10-110		R (all non-detects)
		2-Chlorophenol-d4	0	33-110		
		1,2-Dichlorobenzene-d4	0	16-110		
		Nitrobenzene-d5	0	35-114		
		2-Fluorobiphenyl	0	43-116		
		2,4,6-Tribromophenol	0	10-123		
		Terphenyl-d14	0	33-141		
		Pesticides & PCBs			4	
	OWG00101	Tetrachloro-m-xylene	45	60-150		J
		Tetrachloro-m-xylene	52	60-150		J
	OWG00103	Tetrachloro-m-xylene	59	60-150		J
	OWG00302	Tetrachloro-m-xylene	54	60-150		J
		Tetrachloro-m-xylene	52	60-150		J
	OWG00302D	Tetrachloro-m-xylene	53	60-150		J
		Tetrachloro-m-xylene	52	60-150		J
WF046	All	Volatiles	-	-	-	None
	All	Semivolatiles	-	-	-	None
		Pesticides & PCBs			2	
	31G00101	Tetrachloro-m-xylene	48	60-150		J
		Tetrachloro-m-xylene	55	60-150		J
	31R03301	Tetrachloro-m-xylene	59	60-150		J
WF047	All	Volatiles	-	-	-	None
WF048	All	Volatiles	-	-	-	None
WF049	All	Volatiles	-	-	-	None
	All	Semivolatiles	-	-	-	None
WF051	All	Volatiles	-	-	-	None
WF052	All	Volatiles	-	-	-	None
WF053	All	Volatiles	-	-	-	None
WF054	All	Volatiles	-	-	-	None

Table VI
Summary of Surrogate Recoveries
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF055	All	Volatiles	-	-	-	None

Notes: J = estimated value
UJ = undetected, but number that is reported as the quantification limit is an estimated value.

Table VII
Summary of Compounds Exceeding Instrument Calibration
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Initial Calibration %RSD	Continuing Calibration %D	Qualifier
WF022		Volatiles			
	6/25/96	Acetone	30.2	-	J
	7/19/96	Chloromethane	-	28.8	J
		Chloroethane	-	48.7	J
	7/22/96	Chloroethane	-	30.6	J
		Semivolatiles			
	8/13/96	4,6-Dinitro-2-methylphenol	-	27.2	J
		Pentachlorophenol	-	25.4	J
	8/14/96	4-Chloroaniline	-	31.6	J
		2,4-Dinitrophenol	-	27.6	J
		4,6-Dinitro-2-methylphenol	-	33.8	J
	All	Pesticides/PCBs	-	-	None
WF023		Volatiles			
	6/25/96	Acetone	30.2	-	J
	7/25/96	Acetone	-	33.2	J
	7/31/96	Acetone	-	30.4	J
		Methylene chloride	-	31.7	J
		Carbon disulfide	-	27.2	J
	8/1/96	Chloroethane	-	27.5	J
		Carbon disulfide	-	27.5	J
		Methylene chloride	-	37.8	J
		Semivolatiles			
	8/20/96	4-Nitroaniline	-	37.8	J
		Chrysene	-	27.8	J
	8/21/96	4-Nitroaniline	-	31.5	J
		Chrysene	-	28.5	J
		Benzo(g,h,i)perylene	-	32.7	J
	8/25/96	4,4'-DDT	23.6	-	J
WF024		Volatiles			
	6/25/96	Acetone	30.2	-	J
	8/5/96	Acetone	33.8	-	J
	8/2/96	Chloroethane	-	29.5	J
		Carbon disulfide	-	30.8	J
		Methylene chloride	-	41.0	J
		Semivolatiles			
	8/21/96	4-Nitroaniline	-	28.7	J
		Chrysene	-	29.5	J
		Indeno(1,2,3-cd)pyrene	-	28.1	J
		Dibenz(a,h)anthracene	-	34.0	J
		Benzo(g,h,i)perylene	-	37.6	J
	All	Pesticides/PCBs	-	-	None

Table VII
Summary of Compounds Exceeding Instrument Calibration
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Initial Calibration %RSD	Continuing Calibration %D	Qualifier
WF025		Volatiles			
	8/5/96	Acetone	33.8	-	J
	8/14/96	Chloromethane	26.7	-	J
		Chloroethane	28.5	-	J
		Acetone	29.7	-	J
		Semivolatiles			
	9/9/96	2,4-Dinitrophenol	-	29.9	J
		4-Nitroaniline	-	27.6	J
		4,6-Dinitro-2-methylphenol	-	30.7	J
		Pyrene	-	30.0	J
		3,3'-Dichlorobenzidine	-	37.0	J
		2,4-Dinitrophenol	-	35.6	J
		4-Nitroaniline	-	29.4	J
		4,6-Dinitro-2-methylphenol	-	32.0	J
		Pentachlorophenol	-	27.8	J
		3,3'-Dichlorobenzidine	-	27.8	J
	8/25/96	4,4'-DDT	23.6	-	J
WF026		Volatiles			
	8/5/96	Acetone	33.8	-	J
	8/19/96	Chloromethane	-	46.5	J
		Chloroethane	-	77.1	J
		1,1-Dichloroethane	-	28.6	J
		2-Butanone	-	30.3	J
	8/20/96	Chloromethane	-	32.5	J
		Chloroethane	-	32.4	J
	8/22/96	Acetone	-	37.9	J
		Carbon disulfide	-	28.0	J
		2-Butanone	-	27.8	J
		Semivolatiles			
	9/10/96	2,4-Dinitrophenol	-	35.6	J
		4-Nitroaniline	-	29.4	J
		4,6-Dinitro-2-methylphenol	-	32.0	J
		Pentachlorophenol	-	27.8	J
		3,3'-Dichlorobenzidine	-	27.8	J
	9/10/96	4-Chloroaniline	-	36.8	J
		3-Nitroaniline	-	37.9	J
		2,4-Dinitrophenol	-	29.3	J
		4-Nitroaniline	-	49.5	J
		4,6-Dinitro-2-methylphenol	-	29.4	J
		Pentachlorophenol	-	29.6	J
		3,3'-Dichlorobenzidine	-	54.1	J
		Pesticides & PCBs			
	9/14/96	alpha-BHC	22.2	-	J
		delta-BHC	22.1	-	J

Table VII
Summary of Compounds Exceeding Instrument Calibration
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Initial Calibration %RSD	Continuing Calibration %D	Qualifier
WF027		Volatiles			
	9/1/96	2-Butanone	39.1	-	J
		2-Butanone	0.014 (RRF)	-	J(detects) / R(ND)
	8/5/96	Acetone	33.8	-	J
	9/2/96	Acetone	-	102.4	J
		2-Butanone	-	36.3	J
	8/22/96	Acetone	-	37.9	J
		Carbon disulfide	-	28.0	J
		2-Butanone	-	27.8	J
	8/29/96	Bromomethane	-	31.0	J
		Chloroethane	-	63.9	J
		Acetone	-	37.2	J
	9/2/96	Chloromethane	-	32.4	J
		Chloroethane	-	28.4	J
		Acetone	-	49.2	J
		2-Butanone	-	38.7	J
		4-Methyl-2-pentanone	-	35.7	J
		2-Hexanone	-	38.9	J
		2-Butanone	-	0.019 (RRF)	J (detects) / R (ND)
	9/3/96	Chloromethane	-	27.4	J
		Acetone	-	34.7	J
		2-Butanone	-	32.6	J
		4-Methyl-2-pentanone	-	32.9	J
		2-Hexanone	-	38.9	J
		Semivolatiles			
	9/10/96	4-Chloroaniline	-	36.8	J
		3-Nitroaniline	-	37.9	J
		2,4-Dinitrophenol	-	29.3	J
		4-Nitroaniline	-	49.5	J
		4,6-Dinitro-2-methylphenol	-	29.4	J
		Pentachlorophenol	-	29.6	J
		3,3'-Dichlorobenzidine	-	54.1	J
	9/20/96	3,3'-Dichlorobenzidine	-	30.4	J
	All	Pesticides/PCBs	-	-	None
WF028		Volatiles			
	8/5/96	Acetone	33.8	-	J
	9/2/96	Chloromethane	-	32.4	J
		Chloroethane	-	28.4	J
		Acetone	-	49.2	J
		2-Butanone	-	38.7	J
		4-Methyl-2-pentanone	-	35.7	J
		2-Hexanone	-	38.9	J
	9/3/96	Chloromethane	-	27.4	J
		Acetone	-	34.7	J
		2-Butanone	-	32.6	J
		4-Methyl-2-pentanone	-	32.9	J
		2-Hexanone	-	38.9	J

Table VII
Summary of Compounds Exceeding Instrument Calibration
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Initial Calibration %RSD	Continuing Calibration %D	Qualifier
WF028 cont.	9/6/96	Chloromethane	-	35.4	J
		Acetone	-	41.0	J
		2-Butanone	-	41.8	J
		1,2-Dichloropropane	-	27.6	J
		4-Methyl-2-pentanone	-	40.5	J
		2-Hexanone	-	43.3	J
		Bromoform	-	26.2	J
		1,1,2,2-Tetrachloroethane	-	26.5	J
		Semivolatiles			
	9/20/96	3,3'-Dichlorobenzidine	-	30.4	J
	9/26/96	Benzo(k)fluoroanthene	-	28.5	J
	All	Pesticides/PCBs	-	-	None
WF029		Volatiles			
	9/17/96	Chloromethane	-	38.1	J
		Methylene chloride	-	33.6	J
	9/18/96	2-Hexanone	-	26.5	J
		Semivolatiles			
	9/26/96	Benzo(k)fluoranthene	-	28.5	J
	9/26/96	Benzo(k)fluoranthene	-	25.6	J
	All	Pesticides/PCBs	-	-	None
WF030		Volatiles			
	9/20/96	Methylene chloride	-	35.2	J
	9/23/96	Methylene chloride	-	30.2	J
		Semivolatiles			
	10/16/96	2,4-Dinitrophenol	-	25.8	J
		4-Nitrophenol	-	28.0	J
	All	Pesticides/PCBs	-	-	None
WF031	All	Volatiles	-	-	None
	All	Semivolatiles	-	-	None
		Pesticides & PCBs			
	11/5/96	delta-BHC	21.2	-	J
WF031B	All	Volatiles	-	-	None
		Semivolatiles			
	11/28/96	Di-n-octylphthalate	-	25.3	J
		Pesticides & PCBs			
	12/9-10/97	Alpha-BHC	23.9	-	J
WF032		Volatiles			
	10/10/96	1,1,2,2-Tetrachloroethane	-	27.8	J
		Semivolatiles			
	11/3/96	Hexachlorobutadiene	-	33.5	J
		Hexachlorocyclopentadiene	-	31.5	J
		Di-n-octylphthalate	-	27.0	J
		Pesticides & PCBs			
	11/5/96	delta-BHC	21.2	-	J

Table VII
Summary of Compounds Exceeding Instrument Calibration
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Initial Calibration %RSD	Continuing Calibration %D	Qualifier
WF033		Volatiles			
	10/16/96	Acetone	-	25.3	J
		Semivolatiles			
	11/4/96	Hexachlorobutadiene	-	31.2	J
		Hexachlorocyclopentadiene	-	27.9	J
	All	Pesticides/PCBs	-	-	None
WF034	All	Volatiles	-	-	None
		Semivolatiles			
	11/26/96	Di-n-octylpthalate	-	33.9	J
	All	Pesticides/PCBs	-	-	None
WF035	All	Volatiles	-	-	None
		Semivolatiles			
	11/26/96	Bis(2-ethylhexyl)phthalate	-	25.6	J
		Di-n-octylphthalate	-	32.1	J
	11/27/96	Di-n-octylphthalate	-	30.0	J
		Pesticides & PCBs			
	11/5/96	delta-BHC	21.2	-	J
WF036	All	Volatiles	-	-	None
		Semivolatiles			
		Di-n-octylphthalate	-	30.0	J
		Di-n-octylphthalate	-	25.3	J
		Pesticides & PCBs			
		alpha-BHC	23.9	-	J
WF037	All	Volatiles	-	-	None
		Semivolatiles			
	11/28/96	Di-n-octylphthalate	-	25.3	J
		Pesticides & PCBs			
	12/9-10/96	alpha-BHC	23.9	-	J
WF038		Volatiles			
	12/26/96	Acetone	-	30.6	J
WF039		Volatiles			
	12/26/96	Acetone	-	30.6	J
WF040	All	Volatiles	-	-	None
WF041	All	Volatiles	-	-	None
	All	Semivolatiles	-	-	None
		Pesticides & PCBs			
	6/11-12/97	Methoxychlor	24.2	-	J
		delta-BHC	21.5	-	J
WF042	All	Volatiles	-	-	None
WF043	All	Volatiles	-	-	None

Table VII
Summary of Compounds Exceeding Instrument Calibration
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Initial Calibration %RSD	Continuing Calibration %D	Qualifier
WF044		Volatiles			
	7/7/97	Bromomethane	-	33.5	J
WF045	All	Volatiles	-	-	None
	All	Semivolatiles	-	-	None
		Pesticides & PCBs			
	7/31/97	alpha-BHC	20.3	-	J
		alpha-BHC	24.2	-	J
		gamma-BHC	21.9	-	J
WF046	All	Volatiles	-	-	None
	All	Semivolatiles	-	-	None
		Pesticides & PCBs			
	7/31/97	alpha-BHC	20.3	-	J
		alpha-BHC	24.2	-	J
		gamma-BHC	21.9	-	J
WF047		Volatiles			
	7/21/97	Acetone	35.4	-	J
	7/21/97	Acetone	0.023 RRF	-	J (all detects) R (all non-detects)
		2-Butanone	0.030 RRF	-	J (all detects) R (all non-detects)
	7/28/97	Bromomethane	-	34.6	J
		Acetone	-	35.1	J
	7/29/97	Bromomethane	-	30.5	J
		Acetone	-	30.9	J
	7/21/97	Acetone	-	0.020 (RRF)	J (all detects) R (all non-detects)
		2-Butanone	-	0.030 (RRF)	J (all detects) R (all non-detects)
	7/22/97	Acetone	-	0.020 (RRF)	J (all detects) R (all non-detects)
		2-Butanone	-	0.030 (RRF)	J (all detects) R (all non-detects)
	7/28/97	Acetone	-	0.015 (RRF)	J (all detects) R (all non-detects)
		2-Butanone	-	0.026 (RRF)	J (all detects) R (all non-detects)
	7/29/97	Acetone	-	0.015 (RRF)	J (all detects) R (all non-detects)
		2-Butanone	-	0.026 (RRF)	J (all detects) R (all non-detects)
WF048		Volatiles			
	7/25/97	Bromomethane	36.5	-	J
	7/26/97	Bromomethane	-	28.7	J

Table VII
Summary of Compounds Exceeding Instrument Calibration
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Initial Calibration %RSD	Continuing Calibration %D	Qualifier
WF049	7/21/97	Volatiles Acetone	35.4	-	J
	7/21/97	Acetone	0.023 (RRF)	-	J (all detects) R (all non-detects)
		2-Butanone	0.030 (RRF)	-	J (all detects) R (all non-detects)
	7/28/97	Bromomethane	-	34.6	J
		Acetone	-	35.1	J
	7/22/97	Acetone	-	0.020 (RRF)	J (all detects) R (all non-detects)
		2-Butanone	-	0.030 (RRF)	J (all detects) R (all non-detects)
	7/28/97	Acetone	-	0.015 (RRF)	J (all detects) R (all non-detects)
		2-Butanone	-	0.026 (RRF)	J (all detects) R (all non-detects)
	All	Semivolatiles	-	-	None
WF051	All	Volatiles	-	-	None
WF052		Volatiles			
	7/21/97	Acetone	35.4	-	J
	7/21/97	Acetone	0.023 (RRF)	-	J (all detects) R (all non-detects)
		2-Butanone	0.030 (RRF)	-	J (all detects) R (all non-detects)
	7/29/97	Bromomethane	-	30.5	J
		Acetone	-	30.9	J
	7/29/97	Acetone	-	0.016 (RRF)	J (all detects) R (all non-detects)
		2-Butanone	-	0.026 (RRF)	J (all detects) R (all non-detects)
WF053		Volatiles			
	8/8/97	Acetone	-	36.4	J
WF054		Volatiles			
	8/19/97	Acetone	39.1	-	J
	8/8/97	Acetone	-	36.4	J
	8/19/97	Acetone	-	30.3	J

Table VII
Summary of Compounds Exceeding Instrument Calibration
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds					
SDG	**Date**	**Compound**	**Initial Calibration %RSD**	**Continuing Calibration %D**	**Qualifier**
WF055	All	Volatiles	-	-	None

Notes: %RSD = percent Relative Standard Deviation for initial calibrations

%D = percent Difference for continuing calibrations

J = the compound was positively identified; the associated numerical value is the approximate concentration of the compound in the sample, either because its concentration was lower than the QL (laboratory "J" flag), or because QC criteria were not met (validation "J").

UJ = the compound was not detected above the reported sample QL. However, the reported sample QL is approximate; the compound concentration may not reliably be presumed to be less than the QL value.

R = the sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the compound cannot be verified.

Table VIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Compound	Concentration	Associated Samples
WF022	Volatiles Acetone	8 ug/L	BKT01001 BKR01001 BKG00101 BKG00101D BKG00102 BKG00103
	Methylene chloride	1 ug/L	BKG00202
	Acetone	16 ug/L	BKG00201 BKF01001
	Acetone	14 ug/L	17T01101 17G00102 17G00101 17G00201 17G00301 01G00101 01G00102 01G00102D
	Semivolatiles	ND	-
	Pesticides/PCBs	ND	-
WF023	Volatiles Methylene chloride	2 ug/L	01T01201 01G00401
	Acetone	15 ug/L	01G00201 01G00301 BKG00301 02G00201 02G00101 18G00301 02G00301 02G00301D
	Semivolatiles	ND	-
	Pesticides/PCBs	ND	-
WF024	Volatiles Acetone	2 ug/L	18T01401 18G00101 15G00401 BKG00203 15R01201 15G00701
	Semivolatiles	ND	-
	Pesticides/PCBs	ND	-
WF025	Volatiles Acetone	3 ug/L	15G00503DL 15R01301 15T01601 15G00301 15G00302 15G00303 15G00101 15G00203
	Semivolatiles	ND	-
	Pesticides/PCBs	ND	-

Table VIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Compound	Concentration	Associated Samples
WF026	Volatiles Acetone	11 ug/L	15T01701 15G00202 15G00201 15G00802 15G00801 16G00201 15G00803D 15R01401
	Acetone	4 ug/L	15G00803 16T01801 16G00202 16G00203
	Acetone	5 ug/L	16G00202DL 16G00602 16G00601 16G00403 16G00403DL 16G00403D 16G00403DDL
	Semivolatiles	ND	-
	Pesticides/PCBs	ND	-
WF027	Volatiles Acetone	5 ug/L	16G00401 16G00402 16G00101 16G00301
	Acetone	5 ug/L	09G00301
	Acetone	6 ug/L	16G00501
	Trichloroethene	1 ug/L	16R01501
	Xylenes (total)	2 ug/L	16G00501D 66T02001 66G02101 66G02103
	Acetone	11 ug/L	16G00303 66G02102 09G00101 09G00301D
	Semivolatiles	ND	-
	Pesticides/PCBs	ND	-
WF028	Volatiles Acetone	5 ug/L	10T02101 09G00201 10G00201 11G00102 11G00401 11T02201 11G00301
	Acetone	11 ug/L	10G00101 11G00402 11G00201 12G00201

Table VIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Compound	Concentration	Associated Samples
WF028 cont.	Acetone	5 ug/L	11G00101
	Carbon disulfide	6 ug/L	12G00101
			11R01601
			12G00101D
			11G00201D
	Semivolatiles	ND	-
	Pesticides/PCBs	ND	-
WF029	Volatiles		13T02301
	Acetone	3 ug/L	13G00101
			13R01701
	Acetone	3 ug/L	13G00102
			13G00201
			13G00103
			14G00201
			14G00101
			14G00101D
			66T02401
			66G00901
			66G00904
			66G00902
			66G00903
	Semivolatiles		
	Bis(2-ethylhexyl)phthalate	1 ug/L	All samples in SDG WF029
	Pesticides/PCBs	ND	-
WF030	Volatiles		66T02501
	Acetone	3 ug/L	66G00801
			66G00802
			66G00803
			66G00804
	Semivolatiles		
	Bis(2-ethylhexyl)phthalate	2 ug/L	All samples in SDG WF030
	Pesticides/PCBs	ND	-
WF031	Volatiles	ND	-
	Semivolatiles		
	Di-n-butylphthalate	3 ug/L	05G00801
	Bis(2-ethylhexyl)phthalate	3 ug/L	05G00802
			05G00901
			05G00902
	Di-n-butylphthalate	2 ug/L	05G01001
	Bis(2-ethylhexyl)phthalate	2 ug/L	05G00301
			05R01901
			05G01001D
	Di-n-butylphthalate	2 ug/L	05G00101
			33G00501
			33G00201
			33G00101
			33G00301
			33G00301D
	Pesticides/PCBs	ND	-

Table VIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Compound	Concentration	Associated Samples
WF031B	Volatiles	ND	-
	Semivolatiles	ND	-
	Pesticides/PCBs	ND	-
WF032	Volatiles	ND	-
	Semivolatiles		
	Di-n-butylphthalate	1 ug/L	33G00401 06G00102 06G00101 06G00301 06R02001 29G00501 29G00501D
	Di-n-butylphthalate	3 ug/L	29G00101 66G01201 66G00102
	Pesticides/PCBS	ND	-
WF033	Volatiles	ND	-
	Semivolatiles	ND	-
	Pesticides/PCBs	ND	-
WF034	Volatiles	ND	-
	Semivolatiles		
	Bis(2-ethylhexyl)phthalate	2 ug/L	66G01101 66G01301 66G00501
	Pesticides/PCBs	ND	-
WF035	Volatiles	ND	-
	Semivolatiles	ND	-
	Pesticides/PCBs	ND	-
WF036	Volatiles	ND	-
	Semivolatiles		
	Di-n-butylphthalate	2 ug/L	66G00701 54G00201 54G00101 31G00201 54R02401 54G00101D
	Pesticides/PCBs	ND	-
WF037	Volatiles	ND	-
	Semivolatiles		
	Di-n-butylphthalate	4 ug/L	All samples in SDG WF037
	Pesticides/PCBs	ND	-

Table VIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Compound	Concentration	Associated Samples
WF038	Volatiles Acetone	7 ug/Kg	36BO0101 36BO0102 36BO0103 36BO0201 36BO0202 36BO0203 36BO0301 36BO0302 36BO0303 36BO0303D 36BO0401 36BO0402 36BO0403 36BO0403D
WF039	Volatiles Acetone Methylene chloride	 7 ug/Kg 4 ug/Kg	35BO0203D 35BO0102DL 35BO0105 35BO0201
WF040	Volatiles Acetone Bromomethane Acetone	 3 ug/L 2 ug/L 3 ug/Kg	All water samples in SDG WF040 35BO0402 35BO0501 35BO0501DL 35BO0502 37BO0201 37BO0202 37BO0101 37BO0102 37BO0103 37BO0301 37BO0302 37BO0303 37BO0203D 37BO0103D
WF041	Volatiles Pesticides & PCBs Semivolatiles Di-n-butylphthalate Bis(2-ethylhexyl)phthalate	ND ND 1 ug/L 2 ug/L	- - 13G00301 13G00401
WF042	Volatiles	ND	-
WF043	Volatiles Acetone	 6 ug/L	 33T05301 06G00102 06G00301 33G00401
WF044	Volatiles Acetone	 3 ug/L	66T05601 66G01201 66G01201D 66G00102 66G01301

Table VIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Compound	Concentration	Associated Samples
WF044 cont.	Acetone	11 ug/L	66T05701 66G00401 66G02001 66T05801 66G00603 66G00603D 66G00604 66G00601 66G00602
WF045	Volatiles Acetone	5ug/L	OWT05901 OWR03401 OWG00501 OWG00502 OWG00502D OWG00503 OWT06001 OWG00101 OWG00102 OWG00103 66T06101 66G02301 66G02302 66G02303
	Acetone	5 ug/L	OWT06201 OWG00302 OWG00302D OWG00303 OWG00301 OWT06401 OWT06401DL OWG00401 OWG00201
	Semivolatiles Di-n-butylphthalate	2 ug/L	OWR03401 OWG00501 OWG00502 OWG00502D OWG00503
	Phenol	72 ug/L	OWG00101
	2-Chlorophenol	67 ug/L	OWG00102
	1,4-Dichlorobenzene	33 ug/L	OWG00103
	N-Nitroso-di-n-propylamine	49 ug/L	
	1,2,4-Trichlorobenzene	36 ug/L	
	4-Chloro-3-methylphenol	62 ug/L	
	Acenaphthylene	12 ug/L	
	Acenaphthene	39 ug/L	
	4-Nitrophenol	69 ug/L	
	2,4-Dinitrotoluene	43 ug/L	
	Pentachlorophenol	65 ug/L	
	Pyrene	42 ug/L	
	Di-n-butylphthalate	5 ug/L	66G02301 66G02302 66G02303
	Di-n-butylphthalate	4 ug/L	OWG00401 OWG00201
	Pesticides & PCBs	ND	-

Table VIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Compound	Concentration	Associated Samples
WF046	Volatiles 2-Butanone	4 ug/L	All samples in SDG WF046
	Semivolatiles Di-n-butylphthalate	3 ug/L	31R03301 31G00101 31G00101D
	Pesticides & PCBs	ND	-
WF047	Volatiles Acetone	4 ug/L	39W028 39W027 39W024 39W032 39W034D 39W031 39T10001 39W001 39W002 39W003 39W004 39W005
WF048	Volatiles 2-Butanone	4 ug/L	39R03401
	Acetone 2-Butanone	3 ug/Kg 4 ug/Kg	39D002 39D001 39D007 39D023 39D026 39D016 39D013 39D019 39D018 39D018D 39D022
WF049	Volatiles 2-Butanone	4 ug/L	39U001
	Semivolatiles	ND	-
WF051	Volatiles 2-Butanone	4 ug/L	16T06801 16R03501
WF052	Volatiles	ND	-
WF053	Volatiles Methylene chloride	8 ug/L	15G00602D 15T07501 15G00401 15G00703 15G00703D 15G00501 15G00502 15G00503
WF054	Volatiles Acetone	4 ug/L	30T07701 30R03901 30G00302

Table VIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds			
SDG	**Compound**	**Concentration**	**Associated Samples**
WF054 cont.	Methylene chloride	8 ug/L	15T07601 15G00801 15G00801D 15G00802 15R03801 15G00803 15G00303
WF055	Volatiles	ND	-

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF022	**Client ID:** BKF01001 **Laboratory ID:** RB858010 **Collection Date:** 7/17/96 **Type:** Source blank		
	Volatiles		
	Acetone	4 ug/L	10U ug/L[1]
	Semivolatiles		
	Di-n-butylphthalate	6 ug/L	None
	Pesticides/PCBs	ND	None
WF022	**Client ID:** BKR01001 **Laboratory ID:** RB858002 **Collection Date:** 7/16/96 **Type:** Equipment rinsate		
	Volatiles	ND	None
	Semivolatiles		
	Di-n-butylphthalate	5 ug/L	None
	Bis(2-ethylhexyl)phthalate	2 ug/L	None
	Pesticides/PCBs	ND	None
WF022	**Client ID:** BKT01001 **Laboratory ID:** RB858001 **Collection Date:** 7/16/96 **Type:** Trip blank		
	Volatiles		
	Acetone	3 ug/L	10U ug/L[1]
WF022	**Client ID:** 17T01101 **Laboratory ID:** RB873001 **Collection Date:** 7/18/96 **Type:** Trip blank		
	Volatiles		
	Acetone	8 ug/L	10U ug/L[1]
WF023	**Client ID:** 01R01101 **Laboratory ID:** RB887005 **Collection Date:** 7/23/96 **Type:** Equipment rinsate		
	Volatiles		
	Acetone	4 ug/L	None
	Semivolatiles		
	Di-n-butylphthalate	6 ug/L	None
	Pesticides/PCBS	ND	None
WF023	**Client ID:** 01T01201 **Laboratory ID:** RB887001 **Collection Date:** 7/22/96 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	2 ug/L	10U ug/L[1]
	Acetone	3 ug/L	10U ug/L[1]

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF023	**Client ID:** 16T01301 **Laboratory ID:** RB887014 **Collection Date:** 7/25/96 **Type:** Trip blank		
	Volatiles		
	Acetone	2 ug/L	None
WF024	**Client ID:** 18T01401 **Laboratory ID:** RB92001 **Collection Date:** 7/29/96 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	2 ug/L	None
	Acetone	4 ug/L	10U ug/L[1]
	Chloroform	1 ug/L	None
WF024	**Client ID:** 15R01201 **Laboratory ID:** RB920005 **Collection Date:** 7/31/96 **Type:** Equipment rinsate		
	Volatiles		
	Acetone	6 ug/L	10U ug/L[1]
	Semivolatiles		
	Di-n-butylphthalate	6 ug/L	None
	Pesticides/PCBs	ND	None
WF025	**Client ID:** 15R01301 **Laboratory ID:** RB956011 **Collection Date:** 8/7/96 **Type:** Equipment rinsate		
	Volatiles	ND	None
	Semivolatiles		
	Di-n-butylphthalate	6 ug/L	None
	Pesticides/PCBs	ND	None
WF025	**Client ID:** 15T01501 **Laboratory ID:** RB956001 **Collection Date:** 8/5/96 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	2 ug/L	None
	Acetone	4 ug/L	None
WF025	**Client ID:** 15T01601 **Laboratory ID:** RB956012 **Collection Date:** 8/8/96 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	1 ug/L	None
	Acetone	2 ug/L	10U ug/L

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF026	**Client ID:** 15T01701 **Laboratory ID:** RB980001 **Collection Date:** 8/12/96 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	1 ug/L	None
WF026	**Client ID:** 16T01801 **Laboratory ID:** RB980015 **Collection Date:** 8/15/96 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	1 ug/L	None
	Acetone	3 ug/L	10U ug/L[1]
WF026	**Client ID:** 15R01401 **Laboratory ID:** RB980012 **Collection Date:** 8/14/96 **Type:** Equipment rinsate		
	Volatiles		
	Acetone	6 ug/L	10U ug/L[1]
	Semivolatiles		
	Di-n-butylphthalate	6 ug/L	None
	Pesticides/PCBS	ND	None
WF027	**Client ID:** 16T01901 **Laboratory ID:** RC016001 **Collection Date:** 8/19/96 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	5 ug/L	None
	Acetone	6 ug/L	None
WF027	**Client ID:** 66T02001 **Laboratory ID:** RC016014 **Collection Date:** 8/22/96 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	3 ug/L	None
WF027	**Client ID:** 16R01501 **Laboratory ID:** RC016012 **Collection Date:** 8/21/96 **Type:** Equipment rinsate		
	Volatiles	ND	None
	Semivolatiles		
	Di-n-butylphthalate	5 ug/L	None
	Pesticides/PCBs	ND	None

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Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF028	**Client ID:** 11T02201 **Laboratory ID:** RC044008 **Collection Date:** 8/28/96 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	2 ug/L	None
	Acetone	8 ug/L	10U ug/L[1]
WF028	**Client ID:** 10T02101 **Laboratory ID:** RC044001 **Collection Date:** 8/26/96 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	2 ug/L	None
WF028	**Client ID:** 11R01601 **Laboratory ID:** RC044016 **Collection Date:** 8/28/96 **Type:** Equipment rinsate		
	Volatiles		
	Acetone	9 ug/L	10U ug/L[1]
	Semivolatiles		
	Di-n-butylphthalate	5 ug/L	None
	Pesticides/PCBs	ND	None
WF029	**Client ID:** 13R01701 **Laboratory ID:** RC092008 **Collection Date:** 9/11/96 **Type:** Equipment rinsate		
	Volatiles		
	Acetone	3 ug/L	10U ug/L[1]
	Semivolatiles		
	Di-n-butylphthalate	5 ug/L	None
	Bis(2-ethylhexyl)phthalate	1 ug/L	10U ug/L[1]
	Pesticides/PCBs	ND	None
WF029	**Client ID:** 13T02301 **Laboratory ID:** RC092001 **Collection Date:** 9/9/96 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	1 ug/L	None
	Acetone	2 ug/L	10U ug/L[1]
WF029	**Client ID:** 66T02401 **Laboratory ID:** RC092011 **Collection Date:** 9/12/96 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	3 ug/L	None
	Acetone	3 ug/L	10U ug/L[1]

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Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF030	**Client ID:** 66R01801 **Laboratory ID:** RC121010 **Collection Date:** 9/18/96 **Type:** Equipment rinsate		
	Volatiles		
	Acetone	4 ug/L	None
	Semivolatiles		
	Di-n-butylphthalate	3 ug/L	None
	Bis(2-ethylhexyl)phthalate	1 ug/L	10U ug/L[1]
	Pesticides/PCBs	ND	None
WF030	**Client ID:** 66T02501 **Laboratory ID:** RC121001 **Collection Date:** 9/16/96 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	3 ug/L	None
	Acetone	3 ug/L	10U ug/L[1]
WF030	**Client ID:** 66T02601 **Laboratory ID:** RC121012 **Collection Date:** 9/19/96 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	3 ug/L	None
	Acetone	3 ug/L	None
WF031	**Client ID:** 05T02701 **Laboratory ID:** MB928001 **Collection Date:** 9/23/96 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	2 ug/L	None
WF031	**Client ID:** 33T02801 **Laboratory ID:** MB958001 **Collection Date:** 9/26/96 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	3 ug/L	None
WF031	**Client ID:** 05R01901 **Laboratory ID:** MB928011 **Collection Date:** 9/25/96 **Type:** Equipment rinsate		
	Volatiles	ND	None
	Semivolatiles		
	Di-n-butylphthalate	2 ug/L	10U ug/L[1]
	Pesticides/PCBs	ND	None

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF031B	**Client ID:** 16T04001 **Laboratory ID:** MC447002 **Collection Date:** 11/21/96 **Type:** Trip blank		
	Volatiles	ND	None
WF032	**Client ID:** 06T02901 **Laboratory ID:** MC011001 **Collection Date:** 9/30/96 **Type:** Trip blank		
	Volatiles	ND	None
WF032	**Client ID:** 29T03001 **Laboratory ID:** MC037001 **Collection Date:** 10/3/96 **Type:** Trip blank		
	Volatiles	ND	None
WF032	**Client ID:** 06R02001 **Laboratory ID:** MC011006 **Collection Date:** 10/2/96 **Type:** Equipment rinsate		
	Volatiles	ND	None
	Semivolatiles Di-n-butylphthalate	3 ug/L	10U ug/L[1]
	Pesticides/PCBs	ND	None
WF033	**Client ID:** 29T03101 **Laboratory ID:** MC085001 **Collection Date:** 10/7/96 **Type:** Trip blank		
	Volatiles	ND	None
WF033	**Client ID:** 66T03201 **Laboratory ID:** MC118001 **Collection Date:** 10/10/96 **Type:** Trip blank		
	Volatiles Acetone	26 ug/L	None
WF033	**Client ID:** 66R02101 **Laboratory ID:** MC02101 **Collection Date:** 10/9/96 **Type:** Equipment rinsate		
	Volatiles Methylene chloride	1 ug/L	None
	Semivolatiles Di-n-butylphthalate	6 ug/L	None
	Pesticides/PCBs	ND	None

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF034	**Client ID:** 66T03301 **Laboratory ID:** MC153001 **Collection Date:** 10/14/96 **Type:** Trip blank		
	Volatiles	ND	None
WF034	**Client ID:** 66T03401 **Laboratory ID:** MC176001 **Collection Date:** 10/17/96 **Type:** Trip blank		
	Volatiles	ND	None
WF034	**Client ID:** 66R02201 **Laboratory ID:** MC153007 **Collection Date:** 10/16/96 **Type:** Equipment rinsate		
	Volatiles		
	Toluene	8 ug/L	None
	Ethylbenzene	1 ug/L	None
	Xylenes (total)	2 ug/L	None
	Semivolatiles		
	Di-n-butylphthalate	2 ug/L	None
	Pesticides/PCBs	ND	None
WF035	**Client ID:** 66T03501 **Laboratory ID:** MC214001 **Collection Date:** 10/21/96 **Type:** Trip blank		
	Volatiles	ND	None
WF035	**Client ID:** 66T03601 **Laboratory ID:** MC231001 **Collection Date:** 10/24/96 **Type:** Trip blank		
	Volatiles	ND	None
WF035	**Client ID:** 66R02301 **Laboratory ID:** MC214006 **Collection Date:** 10/23/96 **Type:** Equipment rinsate		
	Volatiles	ND	None
	Semivolatiles		
	Di-n-butylphthalate	3 ug/L	None
	Pesticides/PCBs	ND	None
WF036	**Client ID:** 66T03701 **Laboratory ID:** MC262001 **Collection Date:** 10/28/96 **Type:** Trip blank		
	Volatiles	ND	None

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF036	**Client ID:** 31T03801 **Laboratory ID:** MC284001 **Collection Date:** 10/31/96 **Type:** Trip blank		
	Volatiles	ND	None
WF036	**Client ID:** 54R02401 **Laboratory ID:** MC262007 **Collection Date:** 10/30/96 **Type:** Equipment rinsate		
	Volatiles	ND	None
	Semivolatiles Di-n-butylphthalate	4 ug/L	10U ug/L[1]
	Pesticides/PCBs	ND	ND
WF037	**Client ID:** 15T03901 **Laboratory ID:** MC424001 **Collection Date:** 11/18/96 **Type:** Trip blank		
	Volatiles	ND	None
WF037	**Client ID:** 16T04001 **Laboratory ID:** MC448004 **Collection Date:** 11/21/96 **Type:** Trip blank		
	Volatiles	ND	None
WF037	**Client ID:** 15R02501 **Laboratory ID:** MC424009 **Collection Date:** 11/20/96 **Type:** Equipment rinsate		
	Volatiles	ND	None
WF037	**Client ID:** 15F00201 **Laboratory ID:** MC424010 **Collection Date:** 11/20/96 **Type:** Source blank		
	Volatiles Xylenes (total)	2 ug/L	None
	Semivolatiles Di-n-butylphthalate	4 ug/L	10U ug/L[1]
	Pesticides/PCBs	ND	None
WF038	**Client ID:** 36RO2601 **Laboratory ID:** MC687016 **Collection Date:** 12/18/96 **Type:** Rinsate		
	Volatiles	ND	None

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF038	**Client ID:** 36TO4101 **Laboratory ID:** MC687001 **Collection Date:** 12/17/96 **Type:** Trip Blank		
	Volatiles	ND	None
WF039	**Client ID:** 35TO4201 **Laboratory ID:** MC698001 **Collection Date:** 12/19/97 **Type:** Trip Blank		
	Volatiles	ND	None
WF039	**Client ID:** 35RO2701 **Laboratory ID:** MC698011 **Collection Date:** 12/21/96 **Type:** Equipment rinsate		
	Volatiles	ND	None
WF040	**Client ID:** 35TO4301 **Laboratory ID:** MC783001 **Collection Date:** 1/7/97 **Type:** Trip blank		
	Volatiles		
	Bromomethane	1 ug/L	10U ug/L[1]
WF040	**Client ID:** 37RO2801 **Laboratory ID:** MC783017 **Collection Date:** 1/9/97 **Type:** Equipment rinsate		
	Volatiles		
	Acetone	5 ug/L	10U ug/L[1]
	Carbon disulfide	2 ug/L	None
WF041	**Client ID:** 35T04501 **Laboratory ID:** MD908001 **Collection Date:** 6/11/97 **Type:** Trip blank		
	Volatiles		
	Acetone	6 ug/L	None
WF041	**Client ID:** 37T04601 **Laboratory ID:** MD926001 **Collection Date:** 6/12/97 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	1 ug/L	None
WF041	**Client ID:** 35T04701 **Laboratory ID:** MD950001 **Collection Date:** 6/15/97 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	3 ug/L	None
	Xylene (total)	1 ug/L	None

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF041	**Client ID:** 13T04801 **Laboratory ID:** MD985001 **Collection Date:** 6/16/97 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	2 ug/L	None
	Acetone	6 ug/L	None
WF041	**Client ID:** 35F00301 **Laboratory ID:** MD908002 **Collection Date:** 6/11/97 **Type:** Source blank		
	Semivolatiles		
	Di-n-butylphthalate	3 ug/L	None
	Pesticides & PCBs	**ND**	-
WF041	**Client ID:** 35R03001 **Laboratory ID:** MD908003 **Collection Date:** 6/11/97 **Type:** Equipment rinsate		
	Semivolatiles		
	Di-n-butylphthalate	4 ug/L	None
	Bis(2-ethylhexyl)phthalate	8 ug/L	None
	Pesticides & PCBs	ND	None
WF042	**Client ID:** 05T04901 **Laboratory ID:** ME007001 **Collection Date:** 6/18/97 **Type:** Trip blank		
	Volatiles	ND	None
WF042	**Client ID:** 05T05001 **Laboratory ID:** ME021001 **Collection Date:** 6/20/97 **Type:** Trip blank		
	Volatiles		
	Acetone	2 ug/L	None
WF042	**Client ID:** 05R03101 **Laboratory ID:** ME007006 **Collection Date:** 6/17/97 **Type:** Equipment rinsate		
	Volatiles	ND	None
WF043	**Client ID:** 05R03201 **Laboratory ID:** ME042002 **Collection Date:** 6/23/97 **Type:** Equipment rinsate		
	Volatiles		
	1,2-Dichloropropane	1 ug/L	None

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Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF043	**Client ID:** 05T05101 **Laboratory ID:** MW042001 **Collection Date:** 6/23/97 **Type:** Trip blank		
	Volatiles	ND	None
WF043	**Client ID:** 33T05201 **Laboratory ID:** MW053001 **Collection Date:** 6/24/97 **Type:** Trip blank		
	Volatiles		
	Acetone	3 ug/L	None
WF043	**Client ID:** 33T05301 **Laboratory ID:** ME073001 **Collection Date:** 6/25/97 **Type:** Trip blank		
	Volatiles	ND	None
WF043	**Client ID:** 30T05401 **Laboratory ID:** ME087001 **Collection Date:** 6/26/97 **Type:** Trip blank		
	Volatiles		
	Acetone	4 ug/L	None
WF044	**Client ID:** 06R03301 **Laboratory ID:** ME100002 **Collection Date:** 6/29/97 **Type:** Equipment rinsate		
	Volatiles		
	Acetone	7 ug/L	None
	Trichloroethene	6 ug/L	None
	Toluene	3 ug/L	None
	Ethylbenzene	1 ug/L	None
	Xylene (total)	2 ug/L	None
WF044	**Client ID:** 06T05501 **Laboratory ID:** ME100001 **Collection Date:** 6/29/97 **Type:** Trip blank		
	Volatiles	ND	None
WF044	**Client ID:** 66T05601 **Laboratory ID:** ME110001 **Collection Date:** 6/30/97 **Type:** Trip blank		
	Volatiles		
	Acetone	5 ug/L	10U ug/L'
WF044	**Client ID:** 66T05701 **Laboratory ID:** ME133001 **Collection Date:** 7/2/97 **Type:** Trip blank		
	Volatiles	ND	None

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Summary of Field Blank Contamination
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NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF044	**Client ID:** 66T05801 **Laboratory ID:** ME135001 **Collection Date:** 7/2/97 **Type:** Trip blank		
	Volatiles		
	Acetone	3 ug/L	10U ug/L[1]
WF045	**Client ID:** OWR03401 **Laboratory ID:** ME149002 **Collection Date:** 7/7/97 **Type:** Equipment rinsate		
	Volatiles		
	Acetone	3 ug/L	10U ug/L[1]
	1,2-Dichloropropane	1 ug/L	None
	Semivolatiles		
	Di-n-butylphthalate	5 ug/L	10U ug/L[1]
	Pesticides & PCBs	ND	None
WF045	**Client ID:** OWT05901 **Laboratory ID:** ME149001 **Collection Date:** 7/7/97 **Type:** Trip blank		
	Volatiles		
	Acetone	2 ug/L	10U ug/L[1]
WF045	**Client ID:** OWT06001 **Laboratory ID:** ME159001 **Collection Date:** 7/8/97 **Type:** Trip blank		
	Volatiles	ND	None
WF045	**Client ID:** 66T06101 **Laboratory ID:** ME175001 **Collection Date:** 7/9/97 **Type:** Trip blank		
	Volatiles		
	Acetone	2 ug/L	10U ug/L[1]
WF045	**Client ID:** OWT06201 **Laboratory ID:** ME190001 **Collection Date:** 7/10/97 **Type:** Trip blank		
	Volatiles	ND	None
WF045	**Client ID:** OWT06401 **Laboratory ID:** ME226001 **Collection Date:** 7/14/97 **Type:** Trip blank		
	Volatiles		
	Acetone	250 ug/L	None

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Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF045	**Client ID:** OWT06401DL **Laboratory ID:** ME226001DL **Collection Date:** 7/14/97 **Type:** Trip blank		
	Volatiles		
	Acetone	250 ug/L	None
WF046	**Client ID:** 31R03301 **Laboratory ID:** MW241002 **Collection Date:** 7/15/97 **Type:** Equipment rinsate		
	Volatiles		
	1,2-Dichloropropane	1 ug/L	None
	Semivolatiles		
	Di-n-butylphthalate	12 ug/L	12U ug/L[1]
	Pesticides & PCBs	ND	None
WF046	**Client ID:** 31T06501 **Laboratory ID:** ME241001 **Collection Date:** 7/15/97 **Type:** Trip blank		
	Volatiles		
	Acetone	4 ug/L	None
WF046	**Client ID:** 31T06601 **Laboratory ID:** ME261001 **Collection Date:** 7/16/97 **Type:** Trip blank		
	Volatiles		
	Toluene	1 ug/L	None
WF046	**Client ID:** 31T06701 **Laboratory ID:** ME305001 **Collection Date:** 7/21/97 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	1 ug/L	None
WF047	**Client ID:** STOR_BLK **Laboratory ID:** ME243008 **Collection Date:** 7/15/97 **Type:** Storage blank		
	Volatiles	ND	None
WF047	**Client ID:** STOR_BLK2 **Laboratory ID:** ME267008 **Collection Date:** 7/16/97 **Type:** Storage blank		
	Volatiles		
	Acetone	4 ug/L	None
	Toluene	0.4 ug/L	None

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF047	**Client ID:** 39T10001 **Laboratory ID:** ME244001 **Collection Date:** 7/15/97 **Type:** Trip blank		
	Volatiles		
	Carbon disulfide	0.40 ug/L	None
	Toluene	0.50 ug/L	None
WF048	**Client ID:** 39R03401 **Laboratory ID:** ME264009 **Collection Date:** 7/17/97 **Type:** Equipment rinsate		
	Volatiles		
	1,2-Dichloropropane	1 ug/L	None
WF049	**Client ID:** 39T10201 **Laboratory ID:** ME262001 **Collection Date:** 7/15/97 **Type:** Trip blank		
	Volatiles		
	Toluene	0.90 ug/L	None
WF049	**Client ID:** 39T10401 **Laboratory ID:** ME263007 **Collection Date:** 7/17/97 **Type:** Trip blank		
	Volatiles		
	Toluene	0.40 ug/L	None
WF051	**Client ID:** 16R03501 **Laboratory ID:** ME306002 **Collection Date:** 7/21/97 **Type:** Equipment rinsate		
	Volatiles		
	Methylene chloride	1 ug/L	None
WF051	**Client ID:** 16T06801 **Laboratory ID:** ME306001 **Collection Date:** 7/21/97 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	1 ug/L	None
	Acetone	3 ug/L	None
WF051	**Client ID:** 16T06901 **Laboratory ID:** ME322001 **Collection Date:** 7/22/97 **Type:** Trip blank		
	Volatiles	ND	None
WF051	**Client ID:** 16T07001 **Laboratory ID:** ME340001 **Collection Date:** 7/23/97 **Type:** Trip blank		
	Volatiles	ND	None

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF051	**Client ID:** 16T07101 **Laboratory ID:** ME348001 **Collection Date:** 7/25/97 **Type:** Trip blank		
	Volatiles	ND	None
WF052	**Client ID:** STORAGEBLK **Laboratory ID:** ME346008 **Collection Date:** 7/25/97 **Type:** Storage blank		
	Volatiles		
	Methylene chloride	1 ug/L	None
	Acetone	3 ug/L	None
WF052	**Client ID:** 39T10501 **Laboratory ID:** ME346007 **Collection Date:** 7/25/97 **Type:** Trip blank		
	Volatiles	ND	None
WF053	**Client ID:** 15R03701 **Laboratory ID:** ME367002 **Collection Date:** 7/27/97 **Type:** Equipment rinsate		
	Volatiles	ND	None
WF053	**Client ID:** 15T07201 **Laboratory ID:** ME367001 **Collection Date:** 7/27/97 **Type:** Trip blank		
	Volatiles	ND	None
WF053	**Client ID:** 15T07301 **Laboratory ID:** ME377001 **Collection Date:** 7/28/97 **Type:** Trip blank		
	Volatiles	ND	None
WF053	**Client ID:** 15T07401 **Laboratory ID:** ME390001 **Collection Date:** 7/29/97 **Type:** Trip blank		
	Volatiles	ND	None
WF053	**Client ID:** 15T07501 **Laboratory ID:** ME404001 **Collection Date:** 7/30/97 **Type:** Trip blank		
	Volatiles	ND	None
WF054	**Client ID:** 15R03801 **Laboratory ID:** ME441005 **Collection Date:** 8/5/97 **Type:** Equipment rinsate		
	Volatiles	ND	None

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF054	**Client ID:** 30R03901 **Laboratory ID:** ME450002 **Collection Date:** 8/6/97 **Type:** Equipment rinsate		
	Volatiles		
	1,2-Dichloropropane	1 ug/L	None
WF054	**Client ID:** 15T07601 **Laboratory ID:** ME441001 **Collection Date:** 8/4/97 **Type:** Trip blank		
	Volatiles	ND	None
WF054	**Client ID:** 30T07701 **Laboratory ID:** ME450001 **Collection Date:** 8/5/97 **Type:** Trip blank		
	Volatiles	ND	None
WF055	**Client ID:** OWR04101 **Laboratory ID:** MF004002 **Collection Date:** 10/27/97 **Type:** Equipment rinsate		
	Volatiles	ND	None
WF055	**Client ID:** 13R04201 **Laboratory ID:** MF004005 **Collection Date:** 10/28/97 **Type:** Equipment rinsate		
	Volatiles	ND	None
WF055	**Client ID:** OWT08001 **Laboratory ID:** MF004001 **Collection Date:** 10/27/97 **Type:** Trip blank		
	Volatiles	ND	None

[1] = sample result was modified based on an associated method blank concentration.

Note: see detailed data validation report for the discrete qualifiers.

Table X
Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike and Laboratory Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Client ID	Analyte	Criteria		% Recovery		RPD/Difference	Qualifier
			% Recovery	Difference	MS	MSD		
WF022	BKG00101	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF023	02G00301	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF024	15G00701	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF025	15G00601	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF026	15G00803	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF027	16G00501	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF028	12G00101	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF029	14G00101	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF030	66G00601	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF031	05G01001	Iron	-	±100	-	-	124.8 ug/L	J
		Lead	-	±3.0	-	-	9.2 ug/L	J
		Sodium	-	±5000	-	-	5978 ug/L	J
		Zinc	-	±20.0	-	-	174 ug/L	J
		Cyanide	75-125	-	3.7	-	-	J (det) R (ND)
WF031B	None	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF032	29G00501	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF033	66G00201	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None

Table X
Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike and Laboratory Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Client ID	Analyte	Criteria		% Recovery		RPD/Difference	Qualifier
			% Recovery	Difference	MS	MSD		
WF034	30G00301	Antimony	75-125	-	126.7	-	-	J (all detects)
		Cyanide	-	-	-	-	-	None
WF035	66G01701	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF036	54G00101	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF037	15F00201	Metals	-	-	-	-	-	None
		Cyanide	75-125	-	3.7	-	-	J (det) R (ND)
WF041	35G00101	Aluminum	-	≤100	-	-	402 ug/L	J
		Iron	-	≤100	-	-	309 ug/L	J
		Manganese	-	≤10	-	-	75.2 ug/L	J
		Cyanide	-	-	-	-	-	None
WF045	OWG00502	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF046	31G00101	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF047	39W034	Metals	-	-	-	-	-	None
WF051	None	Metals	-	-	-	-	-	None
WF053	15G00602	Metals	-	-	-	-	-	None
WF054	15G00801	Metals	-	-	-	-	-	None

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF022	**Client ID**	**BKG00101**	**BKG00101D**	
	Laboratory ID	**RB858003**	**RB858004**	
	Collection Date	**7/16/96**	**7/16/96**	
	Aluminum	43.4 ug/L	54.4 ug/L	22
	Barium	15.6 ug/L	15.6 ug/L	0
	Calcium	536 ug/L	558 ug/L	4
	Iron	54.0 ug/L	57.9 ug/L	7
	Lead	ND	0.80 ug/L	Not calculable
	Magnesium	499 ug/L	521 ug/L	4
	Manganese	1.7 ug/L	1.9 ug/L	11
	Selenium	0.67 ug/L	ND	Not calculable
	Sodium	1080 ug/L	1080 ug/L	0
	Zinc	2.4 ug/L	ND	Not calculable
	Cyanide	3.8 ug/L	6.5 ug/L	52
WF022	**Client ID**	**01G00102**	**01G00102D**	
	Laboratory ID	**RB873008**	**RB873009**	
	Collection Date	**7/19/96**	**7/19/96**	
	Aluminum	19.1 ug/L	10.3 ug/L	50
	Barium	15.6 ug/L	15.6 ug/L	0
	Beryllium	0.53 ug/L	ND	Not calculable
	Calcium	5850 ug/L	6250 ug/L	7
	Copper	ND	1.4 ug/L	Not calculable
	Iron	12.2 ug/L	8.8 ug/L	32
	Lead	1.3 ug/L	1.5 ug/L	14
	Magnesium	337 ug/L	331 ug/L	2
	Manganese	6.7 ug/L	9.0 ug/L	29
	Potassium	938 ug/L	842 ug/L	11
	Sodium	2100 ug/L	2070 ug/L	1
	Vanadium	ND	1.6 ug/L	Not calculable
	Zinc	10.2 ug/L	11.4 ug/L	11
	Cyanide	1.9 ug/L	ND	Not calculable
WF023	**Client ID**	**02G00301**	**02G00301D**	
	Laboratory ID	**RB887012**	**RB887013**	
	Collection Date	**7/24/96**	**7/24/96**	
	Aluminum	79.3 ug/L	84.6 ug/L	6
	Barium	128 ug/L	129 ug/L	0.8
	Beryllium	0.39 ug/L	ND	Not calculable
	Calcium	113000 ug/L	113000 ug/L	0
	Iron	36.2 ug/L	38.7 ug/L	7
	Lead	1.4 ug/L	1.3 ug/L	7
	Magnesium	9560 ug/L	9590 ug/L	0.3
	Manganese	13.5 ug/L	13.7 ug/L	1
	Nickel	7.8 ug/L	9.6 ug/L	21
	Potassium	4610 ug/L	4580 ug/L	0.7
	Selenium	1.2 ug/L	0.66 ug/L	58
	Sodium	2200 ug/L	2240 ug/L	2
	Vanadium	3.0 ug/L	2.8 ug/L	7
	Zinc	1.8 ug/L	2.0 ug/L	11
	Cyanide	4.5 ug/L	2.0 ug/L	77

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF024	**Client ID**	**15G00701**	**15G00701D**	
	Laboratory ID	**RB920009**	**RB950010**	
	Collection Date	**7/31/96**	**7/31/96**	
	Aluminum	161 ug/L	173 ug/L	7
	Barium	15.6 ug/L	19.3 ug/L	21
	Calcium	356 ug/L	360 ug/L	1
	Chromium	2.9 ug/L	2.0 ug/L	37
	Iron	183 ug/L	202 ug/L	10
	Lead	0.70 ug/L	0.60 ug/L	15
	Magnesium	433 ug/L	422 ug/L	3
	Manganese	2.8 ug/L	2.6 ug/L	7
	Sodium	1530 ug/L	1610 ug/L	5
	Vanadium	ND	1.2 ug/L	Not calculable
	Zinc	3.4 ug/L	3.6 ug/L	6
	Cyanide	2.6 ug/L	3.2 ug/L	21
WF025	**Client ID**	**15G00601**	**15G00601D**	
	Laboratory ID	**RB956006**	**RB956008**	
	Collection Date	**8/7/96**	**8/7/96**	
	Aluminum	89.4 ug/L	55.8 ug/L	46
	Arsenic	8.0 ug/L	7.8 ug/L	2
	Barium	67.6 ug/L	63.7 ug/L	6
	Calcium	3690 ug/L	3620 ug/L	2
	Iron	31000 ug/L	30500 ug/L	2
	Lead	0.90 ug/L	0.50U ug/L	Not calculable
	Magnesium	1940 ug/L	1900 ug/L	2
	Manganese	139 ug/L	136 ug/L	2
	Potassium	2460 ug/L	2340 ug/L	5
	Sodium	2630 ug/L	2590 ug/L	2
	Zinc	3.4 ug/L	3.3 ug/L	3
	Cyanide	1.5U ug/L	8.1 ug/L	Not calculable
WF026	**Client ID**	**15G00803**	**15G00803D**	
	Laboratory ID	**RB980007**	**RB980008**	
	Collection Date	**8/14/96**	**8/14/96**	
	Aluminum	187 ug/L	146 ug/L	25
	Barium	10.6 ug/L	10.8 ug/L	2
	Calcium	1440 ug/L	1170 ug/L	21
	Chromium	2.9 ug/L	2.0U ug/L	Not calculable
	Cobalt	2.3U ug/L	2.4 ug/L	Not calculable
	Copper	4.0 ug/L	2.4 ug/L	50
	Iron	194 ug/L	175 ug/L	10
	Lead	0.80 ug/L	0.50 ug/L	46
	Magnesium	322 ug/L	296 ug/L	8
	Manganese	33.1 ug/L	32.9 ug/L	0.6
	Potassium	522 ug/L	316U ug/L	Not calculable
	Sodium	5350 ug/L	5380 ug/L	0.6
	Vanadium	2.0 ug/L	1.5 ug/L	29
	Zinc	176 ug/L	178 ug/L	1
	Cyanide	1.6 ug/L	4.2 ug/L	90

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF026	**Client ID**	**16G00403**	**16G00403D**	
	Laboratory ID	**RB980020**	**RB980021**	
	Collection Date	**8/16/96**	**8/16/96**	
	Aluminum	278 ug/L	290 ug/L	4
	Arsenic	1.0 ug/L	0.50U ug/L	Not calculable
	Barium	28.6 ug/L	27.5 ug/L	4
	Calcium	3110 ug/L	3300 ug/L	6
	Chromium	2.3 ug/L	2.9 ug/L	23
	Copper	1.1U ug/L	1.3 ug/L	Not calculable
	Iron	1370 ug/L	879 ug/L	44
	Lead	4.0 ug/L	2.7 ug/L	39
	Magnesium	1320 ug/L	987 ug/L	29
	Manganese	41.3 ug/L	33.5 ug/L	21
	Potassium	540 ug/L	713 ug/L	28
	Sodium	2570 ug/L	2590 ug/L	0.8
	Vanadium	2.2 ug/L	1.2U ug/L	Not calculable
	Zinc	103 ug/L	945 ug/L	161
	Cyanide	2.9 ug/L	1.6 ug/L	58
WF027	**Client ID**	**16G00501**	**16G00501D**	
	Laboratory ID	**RC016009**	**RC016013**	
	Collection Date	**8/21/96**	**8/21/96**	
	Aluminum	12.6 ug/L	16.7 ug/L	28
	Barium	10 ug/L	10 ug/L	0
	Calcium	239 ug/L	234 ug/L	2
	Cobalt	3.2 ug/L	2.3U ug/L	Not calculable
	Iron	9.2 ug/L	5.3 ug/L	54
	Magnesium	276 ug/L	261 ug/L	6
	Manganese	1.0U ug/L	2.1 ug/L	Not calculable
	Sodium	1550 ug/L	1450 ug/L	7
	Zinc	2.6 ug/L	1.6 ug/L	48
WF027	**Client ID**	**09G00301**	**09G00301D**	
	Laboratory ID	**RC016019**	**RC016020**	
	Collection Date	**8/23/96**	**8/23/96**	
	Aluminum	407 ug/L	372 ug/L	9
	Antimony	8.6U ug/L	9.3 ug/L	Not calculable
	Arsenic	2.6 ug/L	2.8 ug/L	7
	Barium	27.1 ug/L	25.8 ug/L	5
	Calcium	15300 ug/L	14600 ug/L	5
	Chromium	4.0 ug/L	2.4 ug/L	50
	Iron	173 ug/L	148 ug/L	16
	Lead	0.50U ug/L	0.60 ug/L	Not calculable
	Magnesium	158 ug/L	160 ug/L	1
	Manganese	1.5 ug/L	1.7 ug/L	12
	Potassium	2390 ug/L	2010 ug/L	17
	Sodium	2070 ug/L	1950 ug/L	6
	Vanadium	16.4 ug/L	14.3 ug/L	14
	Zinc	14.8 ug/L	1.2 ug/L	170

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF028	**Client ID**	**12G00101**	**12G00101D**	
	Laboratory ID	**RC044012**	**RC044017**	
	Collection Date	**8/27/96**	**8/27/96**	
	Aluminum	14.0 ug/L	15.1 ug/L	8
	Barium	14.5 ug/L	14.5 ug/L	0
	Calcium	1840 ug/L	1870 ug/L	2
	Lead	0.60 ug/L	0.50U ug/L	Not calculable
	Magnesium	320 ug/L	327 ug/L	2
	Manganese	1.0U ug/L	1.4 ug/L	Not calculable
	Potassium	2220 ug/L	2290 ug/L	3
	Sodium	2310 ug/L	2360 ug/L	2
	Thallium	0.70 ug/L	0.60U ug/L	Not calculable
	Zinc	6.7 ug/L	5.5 ug/L	20
	Cyanide	1.8U ug/L	2.1 ug/L	Not calculable
WF028	**Client ID**	**11G00201**	**11G00201D**	
	Laboratory ID	**RC044011**	**RC044018**	
	Collection Date	**8/28/96**	**8/28/96**	
	Aluminum	2770 ug/L	2320 ug/L	18
	Arsenic	1.7 ug/L	2.0 ug/L	16
	Barium	50.3 ug/L	51.6 ug/L	3
	Beryllium	0.40 ug/L	0.30U ug/L	Not calculable
	Calcium	35400 ug/L	41800 ug/L	17
	Chromium	20.4 ug/L	19.2 ug/L	6
	Copper	2.0 ug/L	3.1 ug/L	43
	Iron	232 ug/L	337 ug/L	37
	Lead	0.50U ug/L	0.90 ug/L	Not calculable
	Magnesium	388 ug/L	538 ug/L	32
	Manganese	2.2 ug/L	4.8 ug/L	74
	Potassium	12900 ug/L	9610 ug/L	29
	Sodium	3420 ug/L	2950 ug/L	15
	Vanadium	11.0 ug/L	11.0 ug/L	0
	Zinc	3.4 ug/L	24.3 ug/L	151
	Cyanide	1.5U ug/L	3.3 ug/L	Not calculable
WF029	**Client ID**	**14G00101**	**14G00101D**	
	Laboratory ID	**RC092007**	**RC092009**	
	Collection Date	**9/11/96**	**9/11/96**	
	Aluminum	33.1 ug/L	26.5 ug/L	22
	Arsenic	0.50 ug/L	0.50U ug/L	Not calculable
	Barium	22.3 ug/L	22.3 ug/L	0
	Calcium	3060 ug/L	2870 ug/L	6
	Iron	22.0 ug/L	27.3 ug/L	22
	Lead	1.3 ug/L	0.80 ug/L	48
	Magnesium	702 ug/L	691 ug/L	2
	Manganese	1.9 ug/L	1.9 ug/L	0
	Mercury	0.12 ug/L	0.10U ug/L	Not calculable
	Sodium	1590 ug/L	1570 ug/L	1
	Vanadium	1.2U ug/L	1.4 ug/L	Not calculable
	Zinc	89.5 ug/L	96.8 ug/L	8

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF030	**Client ID**	**66G00601**	**66G00601D**	
	Laboratory ID	**RC121007**	**RC121011**	
	Collection Date	**9/18/96**	**9/18/96**	
	Aluminum	39.9 ug/L	39.7 ug/L	0.5
	Barium	38.1 ug/L	36.2 ug/L	5
	Calcium	863 ug/L	770 ug/L	11
	Copper	1.8 ug/L	1.1U ug/L	**Not calculable**
	Iron	8.2 ug/L	41.9 ug/L	134
	Lead	0.90 ug/L	0.50U ug/L	**Not calculable**
	Magnesium	1130 ug/L	1110 ug/L	2
	Manganese	5.0 ug/L	4.6 ug/L	8
	Potassium	860 ug/L	689 ug/L	22
	Selenium	0.64 ug/L	0.60U ug/L	**Not calculable**
	Sodium	1280 ug/L	1160 ug/L	10
	Zinc	2.9 ug/L	4.8 ug/L	49
WF030	**Client ID**	**66G02203**	**66G02203D**	
	Laboratory ID	**RC121016**	**RC121017**	
	Collection Date	**9/20/96**	**9/20/96**	
	Aluminum	44.0 ug/L	51.9 ug/L	16
	Barium	6.4 ug/L	6.4 ug/L	0
	Calcium	751 ug/L	731 ug/L	3
	Cobalt	2.3U ug/L	2.4 ug/L	Not calculable
	Iron	35.6 ug/L	38.9 ug/L	9
	Magnesium	271 ug/L	242 ug/L	11
	Manganese	9.7 ug/L	9.7 ug/L	0
	Potassium	491 ug/L	316U ug/L	Not calculable
	Sodium	2810 ug/L	2760 ug/L	2
	Zinc	1.2 ug/L	2.2 ug/L	59
	Cyanide	1.8U ug/L	12.0 ug/L	Not calculable
WF031	**Client ID**	**05G01001**	**05G01001D**	
	Laboratory ID	**MB928007**	**MB928012**	
	Collection Date	**9/25/96**	**9/25/96**	
	Barium	27.6 ug/L	27.1 ug/L	2
	Calcium	854 ug/L	803 ug/L	6
	Chromium	0.61 ug/L	0.36 ug/L	52
	Cobalt	0.85 ug/L	0.72 ug/L	17
	Copper	35.6 ug/L	1.7U ug/L	Not calculable
	Iron	40.1 ug/L	31.8U ug/L	Not calculable
	Lead	4.4 ug/L	1.8U ug/L	Not calculable
	Magnesium	874 ug/L	871 ug/L	0.6
	Manganese	3.3 ug/L	2.5 ug/L	28
	Mercury	0.03 ug/L	0.04 ug/L	29
	Nickel	1.4 ug/L	1.4 ug/L	0
	Potassium	3.1U ug/L	825 ug/L	Not calculable
	Selenium	5.4 ug/L	3.9U ug/L	Not calculable
	Sodium	15100 ug/L	14900 ug/L	1
	Thallium	7.4 ug/L	1.9U ug/L	Not calculable
	Vanadium	0.58U ug/L	0.63 ug/L	Not calculable
	Zinc	13.7 ug/L	3.8 ug/L	113

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF031	**Client ID**	**33G00301**	**33G00301D**	
	Laboratory ID	**MB958006**	**MB958007**	
	Collection Date	**9/27/96**	**9/27/96**	
	Aluminum	156	98.7	45
	Antimony	3.5	3.4U	Not calculable
	Barium	59.3	59.9	1
	Calcium	2230	2230	0
	Chromium	0.88	0.34U	Not calculable
	Cobalt	0.70	0.49	35
	Iron	107	50.6	72
	Magnesium	1750	1760	0.6
	Manganese	21.2	21.5	1
	Potassium	31.8	1040	188
	Sodium	5370	5550	3
	Thallium	2.9	3.4	16
	Vanadium	1.0	0.58U	Not calculable
	Zinc	7.4	7.2	3
WF032	**Client ID**	**29G00501**	**29G00501D**	
	Laboratory ID	**MC011007**	**MC011008**	
	Collection Date	**10/2/96**	**10/2/96**	
	Barium	89.7 ug/L	84.2 ug/L	6
	Beryllium	0.14 ug/L	0.19 ug/L	30
	Calcium	1580 ug/L	1470 ug/L	7
	Chromium	2.1 ug/L	2.8 ug/L	29
	Cobalt	0.94 ug/L	0.98 ug/L	4
	Copper	2.7 ug/L	4.4 ug/L	48
	Magnesium	2500 ug/L	2320 ug/L	7
	Manganese	8.4 ug/L	8.0 ug/L	5
	Mercury	0.04 ug/L	0.04 ug/L	0
	Sodium	5040 ug/L	5030 ug/L	0.2
	Zinc	5.1 ug/L	3.8 ug/L	29
	Cyanide	1.0 ug/L	1.2 ug/L	18
WF033	**Client ID**	**66G00201**	**66G00201D**	
	Laboratory ID	**MC118002**	**MC118003**	
	Collection Date	**10/9/96**	**10/9/96**	
	Barium	20.8 ug/L	20.7 ug/L	0.5
	Calcium	3250 ug/L	3100 ug/L	5
	Chromium	0.75 ug/L	0.44 ug/L	52
	Copper	1.7U ug/L	2.7 ug/L	Not calculable
	Iron	73.8 ug/L	31.8U ug/L	Not calculable
	Magnesium	456 ug/L	457 ug/L	0.2
	Manganese	3.4 ug/L	3.2 ug/L	6
	Mercury	0.03 ug/L	0.03 ug/L	0
	Potassium	648 ug/L	1920 ug/L	99
	Sodium	3040 ug/L	3020 ug/L	0.7
	Zinc	3.6 ug/L	6.0 ug/L	50

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF034	**Client ID**	**30G00301**	**30G00301D**	
	Laboratory ID	**MC153005**	**MC153008**	
	Collection Date	**10/16/96**	**10/16/96**	
	Barium	28.0 ug/L	27.8 ug/L	0.7
	Beryllium	0.20 ug/L	0.13U ug/L	Not calculable
	Calcium	1530 ug/L	1480 ug/L	3
	Copper	11.0 ug/L	3.2 ug/L	110
	Iron	626 ug/L	634 ug/L	1
	Lead	3.8 ug/L	2.4 ug/L	45
	Magnesium	642 ug/L	650 ug/L	1
	Manganese	20.7 ug/L	21.0 ug/L	1
	Mercury	0.04 ug/L	0.05 ug/L	22
	Potassium	1880 ug/L	2680 ug/L	35
	Sodium	4600 ug/L	4490 ug/L	2
	Zinc	5.5 ug/L	4.4 ug/L	22
WF035	**Client ID**	**66G01701**	**66G01701D**	
	Laboratory ID	**MC214005**	**MC214007**	
	Collection Date	**10/23/96**	**10/23/96**	
	Aluminum	24.3 ug/L	30.9 ug/L	24
	Barium	10.2 ug/L	10.7 ug/L	5
	Calcium	766 ug/L	816 ug/L	6
	Copper	1.7U ug/L	22.5 ug/L	Not calculable
	Iron	343 ug/L	348 ug/L	1
	Lead	2.0U ug/L	2.6 ug/L	Not calculable
	Magnesium	320 ug/L	324 ug/L	1
	Manganese	4.2 ug/L	5.4 ug/L	25
	Mercury	0.03 ug/L	0.03 ug/L	0
	Selenium	4.0 ug/L	3.9U ug/L	Not calculable
	Sodium	7660 ug/L	7790 ug/L	2
	Zinc	2.5 ug/L	26.3 ug/L	165
WF036	**Client ID**	**54G00101**	**54G00101D**	
	Laboratory ID	**MC262004**	**MC262008**	
	Collection Date	**10/30/96**	**10/30/96**	
	Aluminum	87.6 ug/L	91.6 ug/L	4
	Barium	75.2 ug/L	74.3 ug/L	1
	Beryllium	0.18 ug/L	0.18 ug/L	0
	Calcium	1680 ug/L	1660 ug/L	1
	Chromium	1.2 ug/L	1.0 ug/L	2
	Cobalt	0.90 ug/L	1.4 ug/L	43
	Magnesium	1950 ug/L	1920 ug/L	2
	Manganese	13.9 ug/L	12.9 ug/L	7
	Mercury	0.02 ug/L	0.01U ug/L	Not calculable
	Potassium	2410 ug/L	2530 ug/L	5
	Sodium	2110 ug/L	2070 ug/L	2
	Zinc	4.5 ug/L	3.5 ug/L	25

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF041	**Client ID**	**35G00101**	**35G00101D**	
	Laboratory ID	**MD908004**	**MD908005**	
	Collection Date	**6/11/97**	**6/11/97**	
	Aluminum	47.8 ug/L	45.2 ug/L	6
	Barium	78.8 ug/L	79.0 ug/L	0.2
	Calcium	3150 ug/L	3240 ug/L	3
	Copper	8.2 ug/L	6.8 ug/L	19
	Iron	15.9 ug/L	19.0 ug/L	18
	Lead	1.7 ug/L	0.93U ug/L	Not calculable
	Magnesium	2340 ug/L	2370 ug/L	1
	Manganese	28.7 ug/L	28.9 ug/L	0.7
	Sodium	4330 ug/L	4430 ug/L	2
	Thallium	1.9 ug/L	0.89U ug/L	Not calculable
	Zinc	12.1 ug/L	130 ug/L	166
	Cyanide	ND	ND	-
WF041	**Client ID**	**35G00202**	**35G00202D**	
	Laboratory ID	**MD950002**	**MD950003**	
	Collection Date	**6/15/97**	**6/15/97**	
	Aluminum	65.0 ug/L	50.7 ug/L	25
	Barium	24.8 ug/L	25.3 ug/L	2
	Calcium	973 ug/L	1030 ug/L	6
	Copper	5.6 ug/L	3.5 ug/L	46
	Iron	180 ug/L	196 ug/L	8
	Lead	0.93U ug/L	1.9 ug/L	Not calculable
	Magnesium	813 ug/L	819 ug/L	0.7
	Manganese	9.5 ug/L	9.3 ug/L	2
	Selenium	1.8U ug/L	2.6 ug/L	Not calculable
	Sodium	20900 ug/L	21700 ug/L	4
	Thallium	1.0 ug/L	0.89U ug/L	Not calculable
	Zinc	18.7 ug/L	15.4 ug/L	19
	Cyanide	ND	ND	-
WF045	**Client ID**	**OWG00502**	**OWG00502D**	
	Laboratory ID	**ME149004**	**ME149005**	
	Collection Date	**7/8/97**	**7/8/97**	
	Aluminum	175 ug/L	160 ug/L	9
	Barium	7.3 ug/L	7.1 ug/L	3
	Calcium	648 ug/L	585 ug/L	10
	Copper	2.9 ug/L	4.4 ug/L	41
	Iron	106 ug/L	97.1 ug/L	9
	Magnesium	308 ug/L	317 ug/L	3
	Manganese	3.3 ug/L	3.5 ug/L	6
	Nickel	7.8 ug/L	7.7U ug/L	Not calculable
	Sodium	1990 ug/L	2060 ug/L	3
	Zinc	4.5 ug/L	4.7 ug/L	4
	Cyanide	ND	ND	-

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF045	**Client ID**	**OWG00302**	**OWG00302D**	
	Laboratory ID	**ME190002**	**ME190003**	
	Collection Date	**7/10/97**	**7/10/97**	
	Aluminum	31.5 ug/L	16.6U ug/L	Not calculable
	Barium	10.2 ug/L	10.5 ug/L	3
	Calcium	460 ug/L	454 ug/L	1
	Iron	83.3 ug/L	51.1 ug/L	48
	Lead	1.9 ug/L	1.2U ug/L	Not calculable
	Magnesium	286 ug/L	300 ug/L	5
	Manganese	3.0 ug/L	3.0 ug/L	0
	Sodium	1670 ug/L	1670 ug/L	0
	Zinc	3.4 ug/L	3.8 ug/L	11
	Cyanide	ND	ND	-
WF046	**Client ID**	**31G00101**	**31G00101D**	
	Laboratory ID	**ME241003**	**ME241004**	
	Collection Date	**7/15/97**	**7/15/97**	
	Aluminum	96.0 ug/L	91.1 ug/L	5
	Barium	22.6 ug/L	22.5 ug/L	0.4
	Calcium	857 ug/L	851 ug/L	0.7
	Copper	1.3U ug/L	1.4 ug/L	Not calculable
	Iron	120 ug/L	103 ug/L	15
	Magnesium	662 ug/L	675 ug/L	2
	Manganese	9.7 ug/L	9.9 ug/L	2
	Potassium	1910 ug/L	2200 ug/L	15
	Sodium	1760 ug/L	1890 ug/L	7
	Vanadium	1.8 ug/L	1.7U ug/L	Not calculable
	Zinc	3.5 ug/L	9.8 ug/L	95
	Cyanide	ND	ND	-
WF047	**Client ID**	**39W034**	**39W034D**	
	Laboratory ID	**ME243005**	**ME243006**	
	Collection Date	**7/15/97**	**7/15/97**	
	Aluminum	94.0 ug/L	76.3 ug/L	21
	Barium	22.9 ug/L	22.8 ug/L	0.4
	Calcium	1030 ug/L	1010 ug/L	2
	Copper	8.2 ug/L	1.3U ug/L	Not calculable
	Iron	747 ug/L	751 ug/L	0.5
	Magnesium	871 ug/L	854 ug/L	2
	Manganese	12.5 ug/L	12.6 ug/L	0.8
	Sodium	2210 ug/L	2090 ug/L	6
	Zinc	14.7 ug/L	3.0 ug/L	132
WF051	**Client ID**	**16G00101**	**16G00101D**	
	Laboratory ID	**ME340009**	**ME340010**	
	Collection Date	**7/24/97**	**7/24/97**	
	Barium	20.5 ug/L	20.7 ug/L	1
	Calcium	514 ug/L	520 ug/L	1
	Copper	1.7 ug/L	1.7 ug/L	0
	Iron	11.2 ug/L	14.7 ug/L	27
	Magnesium	617 ug/L	623 ug/L	1
	Manganese	3.2 ug/L	3.0 ug/L	6
	Sodium	2130 ug/L	2110 ug/L	1
	Zinc	3.2 ug/L	8.2 ug/L	88

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF053	**Client ID**	**15G00602**	**15G00602D**	
	Laboratory ID	**ME367004**	**ME367005**	
	Collection Date	**7/27/97**	**7/27/97**	
	Aluminum	16.6U ug/L	29.9 ug/L	Not calculable
	Barium	13.0 ug/L	13.0 ug/L	0
	Calcium	676 ug/L	675 ug/L	0.1
	Chromium	3.3 ug/L	4.2 ug/L	24
	Iron	33.8 ug/L	92.6 ug/L	93
	Magnesium	504 ug/L	490 ug/L	3
	Manganese	2.3 ug/L	2.7 ug/L	16
	Sodium	2870 ug/L	2740 ug/L	5
	Zinc	3.1 ug/L	3.4 ug/L	9
WF053	**Client ID**	**15G00703**	**15G00703D**	
	Laboratory ID	**ME404003**	**ME404004**	
	Collection Date	**7/30/97**	**7/30/97**	
	Aluminum	43.6 ug/L	108 ug/L	14
	Antimony	17.3U ug/L	21.2 ug/L	Not calculable
	Barium	6.6 ug/L	6.2 ug/L	6
	Calcium	587 ug/L	549 ug/L	7
	Chromium	10.6 ug/L	13.4 ug/L	23
	Copper	2.9 ug/L	4.5 ug/L	43
	Iron	107 ug/L	115 ug/L	7
	Lead	0.93U ug/L	5.1 ug/L	Not calculable
	Magnesium	280 ug/L	266 ug/L	5
	Manganese	6.9 ug/L	6.5 ug/L	6
	Nickel	10.9 ug/L	20.3 ug/L	60
	Sodium	2040 ug/L	1820 ug/L	11
	Zinc	5.2 ug/L	6.1 ug/L	16
WF054	**Client ID**	**15G00801**	**15G00801D**	
	Laboratory ID	**ME441002**	**ME441003**	
	Collection Date	**8/4/97**	**8/4/97**	
	Aluminum	143 ug/L	116 ug/L	21
	Arsenic	2.0 ug/L	1.1U ug/L	Not calculable
	Barium	34.7 ug/L	37.3 ug/L	7
	Calcium	1870 ug/L	2010 ug/L	7
	Copper	5.2 ug/L	2.6 ug/L	67
	Iron	4760 ug/L	4940 ug/L	4
	Magnesium	1370 ug/L	1470 ug/L	7
	Manganese	84.6 ug/L	91.4 ug/L	8
	Mercury	0.04U ug/L	0.07 ug/L	Not calculable
	Sodium	1830 ug/L	1960 ug/L	7
	Thallium	0.89U ug/L	0.90 ug/L	Not calculable
	Zinc	8.5 ug/L	6.6 ug/L	25

Table XII
Summary of Analytes Exceeding Instrument Calibration
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Date	Analyte	Initial Calibration r	Continuing Calibration %R	Qualifier
WF022	All	Metals Cyanide	- -	- -	None None
WF023	All	Metals Cyanide	- -	- -	None None
WF024	All	Metals Cyanide	- -	- -	None None
WF025	All	Metals Cyanide	- -	- -	None None
WF026	All	Metals Cyanide	- -	- -	None None
WF027	All	Metals Cyanide	- -	- -	None None
WF028	All	Metals Cyanide	- -	- -	None None
WF029	All	Metals Cyanide	- -	- -	None None
WF030	All	Metals Cyanide	- -	- -	None None
WF031	All	Metals Cyanide	- -	- -	None None
WF031B	All	Metals Cyanide	- -	- -	None None
WF032	All	Metals Cyanide	- -	- -	None None
WF033	All	Metals Cyanide	- -	- -	None None
WF034	All	Metals Cyanide	- -	- -	None None
WF035	All	Metals Cyanide	- -	- -	None None
WF036	All	Metals Cyanide	- -	- -	None None
WF037	All	Metals Cyanide	- -	- -	None None
WF041	All	Metals Cyanide	- -	- -	None None
WF045	All	Metals Cyanide	- -	- -	None None
WF046	All	Metals Cyanide	- -	- -	None None
WF047	All	Metals	-	-	None
WF051	All	Metals	-	-	None

Table XII
Summary of Analytes Exceeding Instrument Calibration
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Date	Analyte	Initial Calibration r	Continuing Calibration %R	Qualifier
WF053	All	Metals	-	-	None
WF054	All	Metals	-	-	None

Notes: r = correlation coefficient for initial calibrations

%R = percent recovery for continuing calibrations

J = the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample because QC criteria were not met (validation "J").

UJ = the analyte was not detected above the reported sample IDL. However, the reported sample is approximate; the analyte concentration may not reliably be presumed to be less than the IDL value.

R = the sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Table XIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes			
SDG	**Analyte**	**Concentration**	**Associated Samples**
WF022	Aluminum	6.240 ug/L	All samples in SDG WF022
	Iron	12.320 ug/L	
	Lead	0.500 ug/L	
	Sodium	38.890 ug/L	
	Zinc	3.660 ug/L	
WF023	Arsenic	-0.500 ug/L	All samples in SDG WF023
	Iron	5.980 ug/L	
	Lead	1.200 ug/L	
	Sodium	34.400 ug/L	
	Zinc	1.200 ug/L	
WF024	Aluminum	10.600 ug/L	All samples in SDG WF024
	Iron	13.190 ug/L	
	Lead	0.500 ug/L	
	Sodium	37.550 ug/L	
WF025	Aluminum	13.650 ug/L	All samples in SDG WF025
	Beryllium	-0.320 ug/L	
	Iron	7.390 ug/L	
	Selenium	0.650 ug/L	
	Zinc	1.610 ug/L	
WF026	Aluminum	17.380 ug/L	All samples in SDG WF026
	Calcium	119.520 ug/L	
	Iron	10.050 ug/L	
	Magnesium	22.940 ug/L	
	Mercury	0.140 ug/L	
	Sodium	41.280 ug/L	
	Zinc	2.510 ug/L	
	Mercury	0.20 ug/L	All samples in SDG WF026
WF027	Aluminum	18.000 ug/L	All samples in SDG WF027
	Antimony	9.280 ug/L	
	Arsenic	0.500 ug/L	
	Calcium	94.550 ug/L	
	Sodium	28.990 ug/L	
	Vanadium	1.280 ug/L	
	Mercury	0.21 ug/L	All samples in SDG WF027
WF028	Aluminum	51.600 ug/L	All samples in SDG WF028
	Antimony	-10.930 ug/L	
	Calcium	113.470 ug/L	
	Magnesium	45.540 ug/L	
	Mercury	0.140 ug/L	
	Potassium	498.120 ug/L	
	Sodium	43.870 ug/L	
	Zinc	1.230 ug/L	

Table XIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF029	Aluminum Barium Cobalt Iron Vanadium	10.6 ug/L 3.0 ug/L 2.7 ug/L 21.4 ug/L 1.4 ug/L	All samples in SDG WF029
	Cobalt Vanadium	2.7 ug/L 1.6 ug/L	All samples in SDG WF029
	Mercury	-0.1 ug/L	All samples in SDG WF029
	Iron Vanadium	5.3 ug/L 1.6 ug/L	All samples in SDG WF029
	Calcium Cobalt Iron Sodium Zinc	153.810 ug/L 2.390 ug/L 11.590 ug/L 37.260 ug/L 1.630 ug/L	All samples in SDG WF029
WF030	Calcium Iron Sodium	59.580 ug/L 6.080 ug/L 54.620 ug/L	All samples in SDG WF030
WF031	Mercury Potassium Silver Thallium	0.030 ug/L -617.8 ug/L -1.2 ug/L 3.3 ug/L	All samples in SDG WF031
	Mercury Potassium Silver Thallium	0.047 ug/L 34.4 ug/L -1.6 ug/L 3.7 ug/L	All samples in SDG WF031
	Mercury Potassium Silver	0.055 ug/L 542.9 ug/L -1.4 ug/L	All samples in SDG WF031
	Mercury Potassium Silver Thallium	0.070 ug/L -21.4 ug/L -1.3 ug/L 3.5 ug/L	All samples in SDG WF031
	Mercury Potassium	0.047 ug/L -411.210 ug/L	All samples in SDG WF031
	Mercury Potassium Silver Thallium	0.085 ug/L 955.8 ug/L -2.5 ug/L 3.2 ug/L	All samples in SDG WF031
	Mercury	0.127 ug/L	All samples in SDG WF031
	Mercury	0.130 ug/L	All samples in SDG WF031
	Mercury Potassium Silver	-0.030 ug/L -335.53 ug/L -1.420 ug/L	All samples in SDG WF031

Table XIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF031 cont.	Arsenic	-6.4 ug/L	All samples in SDG WF031
	Chromium	-0.4 ug/L	
	Mercury	0.034 ug/L	
	Potassium	171.0 ug/L	
	Thallium	5.1 ug/L	
	Vanadium	1.4 ug/L	
	Mercury	0.016 ug/L	All samples in SDG WF031
	Potassium	342.4 ug/L	
	Silver	-1.2 ug/L	
	Thallium	5.2 ug/L	
	Vanadium	0.8 ug/L	
	Chromium	-0.7 ug/L	All samples in SDG WF031
	Mercury	0.011 ug/L	
	Potassium	308.7 ug/L	
	Thallium	6.2 ug/L	
	Vanadium	0.7 ug/L	
	Barium	-0.2 ug/L	All samples in SDG WF031
	Chromium	-0.6 ug/L	
	Mercury	-0.021 ug/L	
	Potassium	377.6 ug/L	
	Thallium	7.2 ug/L	
	Mercury	0.014 ug/L	All samples in SDG WF031
	Arsenic	-6.7 ug/L	All samples in SDG WF031
	Barium	-0.2 ug/L	
	Chromium	-0.8 ug/L	
	Mercury	-0.032 ug/L	
	Nickel	-1.4 ug/L	
	Potassium	441.5 ug/L	
	Thallium	5.7 ug/L	
	Vanadium	0.6 ug/L	
WF031B	Copper	604 ug/L	All samples in SDG WF031B
	Aluminum	-19.5 ug/L	All samples in SDG WF031B
	Barium	0.4 ug/L	
	Copper	4.4 ug/L	
	Manganese	0.4 ug/L	
	Barium	0.4 ug/L	All samples in SDG WF031B
	Copper	6.6 ug/L	
	Iron	3.5 ug/L	
	Mercury	0.0 ug/L	
	Nickel	9.5 ug/L	
	Sodium	10.6 ug/L	
	Barium	25.130 ug/L	All samples in SDG WF031B
	Beryllium	-0.830 ug/L	
	Calcium	129.890 ug/L	
	Copper	8.310 ug/L	
	Iron	8.680 ug/L	
	Magnesium	25.430 ug/L	
	Manganese	0.490 ug/L	
	Silver	2.970 ug/L	
	Sodium	84.450 ug/L	
	Vanadium	2.060 ug/L	
	Zinc	3.100 ug/L	
	Cyanide	-0.981 ug/L	

Table XIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF032	Copper	4.5 ug/L	All samples in SDG WF032
	Manganese	0.5 ug/L	
	Mercury	0.0242 ug/L	
	Potassium	-1595.8 ug/L	
	Beryllium	0.2 ug/L	All samples in SDG WF032
	Cobalt	0.3 ug/L	
	Copper	5.5 ug/L	
	Manganese	0.7 ug/L	
	Mercury	0.0265 ug/L	
	Sodium	17.3 ug/L	
	Beryllium	0.2 ug/L	All samples in SDG WF032
	Copper	4.9 ug/L	
	Manganese	0.6 ug/L	
	Mercury	0.0255 ug/L	
	Potassium	1914.8 ug/L	
	Sodium	11.6 ug/L	
	Beryllium	0.2 ug/L	All samples in SDG WF032
	Copper	5.6 ug/L	
	Manganese	0.6 ug/L	
	Mercury	-0.0178 ug/L	
	Sodium	17.4 ug/L	
	Barium	1.210 ug/L	All samples in SDG WF032
	Chromium	2.750 ug/L	
	Copper	3.390 ug/L	
	Manganese	0.410 ug/L	
	Mercury	0.015 ug/L	
	Sodium	856.490 ug/L	
	Zinc	2.310 ug/L	
	Barium	0.3 ug/L	All samples in SDG WF032
	Beryllium	0.1 ug/L	
	Cobalt	0.4 ug/L	
	Copper	5.8 ug/L	
	Manganese	0.2 ug/L	
	Barium	0.3 ug/L	All samples in SDG WF032
	Beryllium	0.1 ug/L	
	Copper	5.8 ug/L	
	Manganese	0.4 ug/L	
	Mercury	-0.0874 ug/L	
	Nickel	2.0 ug/L	
	Sodium	11.5 ug/L	
	Barium	0.2 ug/L	All samples in SDG WF032
	Beryllium	0.1 ug/L	
	Copper	5.6 ug/L	
	Manganese	0.5 ug/L	
	Thallium	2.6 ug/L	
	Barium	0.3 ug/L	All samples in SDG WF032
	Beryllium	0.3 ug/L	
	Cobalt	0.6 ug/L	
	Copper	7.0 ug/L	
	Manganese	0.8 ug/L	
	Nickel	1.4 ug/L	
	Thallium	4.3 ug/L	

Table XIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF032 cont.	Aluminum	107.660 ug/L	All samples in SDG WF032
	Antimony	4.320 ug/L	
	Barium	1.760 ug/L	
	Cadmium	1.660 ug/L	
	Calcium	105.840 ug/L	
	Cobalt	0.430 ug/L	
	Copper	12.450 ug/L	
	Iron	54.350 ug/L	
	Magnesium	103.090 ug/L	
	Manganese	0.280 ug/L	
	Sodium	154.770 ug/L	
	Zinc	9.120 ug/L	
	Antimony	4.3 ug/L	All samples in SDG WF032
	Barium	0.4 ug/L	
	Beryllium	0.3 ug/L	
	Copper	5.2 ug/L	
	Manganese	0.6 ug/L	
	Sodium	10.2 ug/L	All samples in SDG WF032
WF033	Barium	0.3 ug/L	All samples in SDG WF033
	Beryllium	0.1 ug/L	
	Cobalt	0.4 ug/L	
	Copper	5.8 ug/L	
	Manganese	0.2 ug/L	
	Mercury	0.07 ug/L	
	Potassium	-1595.8 ug/L	
	Barium	0.3 ug/L	All samples in SDG WF033
	Beryllium	0.1 ug/L	
	Copper	5.8 ug/L	
	Manganese	0.4 ug/L	
	Mercury	0.04 ug/L	
	Potassium	655.4 ug/L	
	Barium	0.2 ug/L	All samples in SDG WF033
	Beryllium	0.1 ug/L	
	Copper	5.6 ug/L	
	Manganese	0.5 ug/L	
	Mercury	0.05 ug/L	
	Potassium	1914.8 ug/L	
	Thallium	2.6 ug/L	
	Barium	0.3 ug/L	All samples in SDG WF033
	Beryllium	0.3 ug/L	
	Cobalt	0.6 ug/L	
	Copper	7.0 ug/L	
	Manganese	0.8 ug/L	
	Potassium	425.8 ug/L	
	Thallium	4.3 ug/L	
	Aluminum	164.460 ug/L	All samples in SDG WF033
	Barium	1.220 ug/L	
	Calcium	107.040 ug/L	
	Copper	2.900 ug/L	
	Iron	33.430 ug/L	
	Magnesium	82.790 ug/L	
	Manganese	0.330 ug/L	
	Potassium	1602.780 ug/L	
	Sodium	221.450 ug/L	
	Zinc	1.660 ug/L	

Table XIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF033 cont.	Mercury	0.06 ug/L	All samples in SDG WF033
	Barium	0.4 ug/L	All samples in SDG WF033
	Beryllium	0.3 ug/L	
	Copper	5.2 ug/L	
	Manganese	0.6 ug/L	
	Mercury	0.05 ug/L	
	Potassium	163.8 ug/L	
	Antimony	4.810 ug/L	All samples in SDG WF033
	Barium	0.460 ug/L	
	Copper	2.870 ug/L	
	Manganese	0.330 ug/L	
	Potassium	509.990 ug/L	
	Sodium	137.200 ug/L	
	Zinc	3.200 ug/L	
	Barium	0.8 ug/L	All samples in SDG WF033
	Beryllium	0.6 ug/L	
	Cadmium	0.8 ug/L	
	Chromium	0.9 ug/L	
	Cobalt	1.1 ug/L	
	Manganese	1.0 ug/L	
	Potassium	1734.0 ug/L	
	Thallium	2.4 ug/L	
	Vanadium	1.1 ug/L	
	Barium	1.2 ug/L	All samples in SDG WF033
	Beryllium	0.8 ug/L	
	Cadmium	0.9 ug/L	
	Chromium	1.2 ug/L	
	Cobalt	1.1 ug/L	
	Manganese	1.3 ug/L	
	Potassium	1605.5 ug/L	
	Thallium	3.4 ug/L	
	Vanadium	1.8 ug/L	
	Barium	1.1 ug/L	All samples in SDG WF033
	Beryllium	0.8 ug/L	
	Cadmium	0.8 ug/L	
	Chromium	1.1 ug/L	
	Cobalt	1.1 ug/L	
	Manganese	1.2 ug/L	
	Potassium	768.8 ug/L	
	Thallium	3.2 ug/L	
	Vanadium	1.7 ug/L	
	Barium	0.7 ug/L	All samples in SDG WF033
	Beryllium	0.7 ug/L	
	Cadmium	0.6 ug/L	
	Chromium	0.9 ug/L	
	Cobalt	0.8 ug/L	
	Manganese	1.0 ug/L	
	Potassium	314.6 ug/L	
	Vanadium	1.2 ug/L	

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Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF033 cont.	Barium	1.0 ug/L	All samples in SDG WF033
	Beryllium	0.6 ug/L	
	Cadmium	0.6 ug/L	
	Chromium	0.9 ug/L	
	Cobalt	1.0 ug/L	
	Manganese	1.0 ug/L	
	Potassium	684.9 ug/L	
	Thallium	2.2 ug/L	
	Vanadium	1.2 ug/L	
	Barium	0.9 ug/L	All samples in SDG WF033
	Beryllium	0.7 ug/L	
	Cadmium	0.7 ug/L	
	Chromium	0.9 ug/L	
	Cobalt	1.0 ug/L	
	Manganese	1.0 ug/L	
	Potassium	722.1 ug/L	
	Thallium	3.4 ug/L	
	Vanadium	1.2 ug/L	
WF034	Copper	5.8 ug/L	All samples in SDG WF034
	Mercury	0.023 ug/L	
	Copper	5.8 ug/L	All samples in SDG WF034
	Manganese	0.4 ug/L	
	Mercury	0.017 ug/L	
	Beryllium	0.1 ug/L	All samples in SDG WF034
	Copper	5.6 ug/L	
	Manganese	0.5 ug/L	
	Mercury	0.030 ug/L	
	Beryllium	0.3 ug/L	All samples in SDG WF034
	Copper	7.0 ug/L	
	Manganese	0.8 ug/L	
	Mercury	0.042 ug/L	
	Sodium	10.2 ug/L	
	Barium	0.460 ug/L	66G02001
	Copper	2.870 ug/L	66G00302
	Sodium	137.200 ug/L	66G01801
	Zinc	3.200 ug/L	30G00301
	Cyanide	-1.327 ug/L	30G00401
			66R02201
			30G00301D
	Mercury	0.024 ug/L	All samples in SDG WF034
	Beryllium	0.3 ug/L	All samples in SDG WF034
	Copper	5.2 ug/L	
	Manganese	0.6 ug/L	
	Mercury	0.026 ug/L	
	Mercury	0.040 ug/L	All samples in SDG WF034
	Mercury	0.033 ug/L	All samples in SDG WF034

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Summary of Method Blank Contamination
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NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF034 cont.	Arsenic	-13.610 ug/L	66G01101
	Barium	1.700 ug/L	66G01301
	Beryllium	-0.710 ug/L	66G00501
	Calcium	108.610 ug/L	66G00501F
	Copper	1.700 ug/L	
	Lead	-8.620 ug/L	
	Manganese	0.790 ug/L	
	Selenium	10.810 ug/L	
	Sodium	70.400 ug/L	
	Zinc	3.200 ug/L	
	Beryllium	0.2 ug/L	All samples in SDG WF034
	Silver	3.3 ug/L	
	Sodium	11.9 ug/L	
	Beryllium	0.2 ug/L	All samples in SDG WF034
	Manganese	0.4 ug/L	
	Silver	2.2 ug/L	
	Sodium	12.2 ug/L	
	Beryllium	0.5 ug/L	All samples in SDG WF034
	Copper	1.9 ug/L	
	Manganese	0.6 ug/L	
	Sodium	20.0 ug/L	
	Beryllium	0.1 ug/L	All samples in SDG WF034
	Silver	2.6 ug/L	
	Sodium	17.3 ug/L	
	Beryllium	0.2 ug/L	All samples in SDG WF034
	Manganese	0.4 ug/L	
	Sodium	9.7 ug/L	
WF035	Barium	0.8 ug/L	All samples in SDG WF035
	Beryllium	0.6 ug/L	
	Manganese	1.0 ug/L	
	Mercury	0.0239 ug/L	
	Thallium	2.4 ug/L	
	Barium	1.2 ug/L	All samples in SDG WF035
	Beryllium	0.8 ug/L	
	Manganese	1.3 ug/L	
	Mercury	0.0256 ug/L	
	Thallium	3.4 ug/L	
	Barium	1.1 ug/L	All samples in SDG WF035
	Beryllium	0.8 ug/L	
	Manganese	1.2 ug/L	
	Mercury	0.0401 ug/L	
	Thallium	3.2 ug/L	
	Barium	0.7 ug/L	All samples in SDG WF035
	Beryllium	0.7 ug/L	
	Manganese	1.0 ug/L	
	Mercury	0.334 ug/L	
	Aluminum	101.120 ug/L	All samples in SDG WF035
	Barium	0.410 ug/L	
	Iron	56.400 ug/L	
	Manganese	0.430 ug/L	
	Sodium	152.450 ug/L	
	Zinc	2.190 ug/L	

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Summary of Method Blank Contamination
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NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF035 cont.	Barium	1.0 ug/L	All samples in SDG WF035
	Beryllium	0.6 ug/L	
	Manganese	1.0 ug/L	
	Mercury	0.0250 ug/L	
	Thallium	2.2 ug/L	
	Barium	0.9 ug/L	All samples in SDG WF035
	Beryllium	0.7 ug/L	
	Manganese	1.0 ug/L	
	Thallium	3.4 ug/L	
	Barium	0.570 ug/L	All samples in SDG WF035
	Beryllium	-0.910 ug/L	
	Calcium	109.820 ug/L	
	Copper	5.470 ug/L	
	Manganese	0.720 ug/L	
	Zinc	4.400 ug/L	
	Manganese	0.6 ug/L	All samples in SDG WF035
	Manganese	0.4 ug/L	All samples in SDG WF035
	Barium	0.4 ug/L	All samples in SDG WF035
	Beryllium	-0.2 ug/L	
	Manganese	0.6 ug/L	
	Beryllium	-0.2 ug/L	All samples in SDG WF035
	Manganese	0.6 ug/L	
	Beryllium	-0.2 ug/L	All samples in SDG WF035
	Manganese	0.4 ug/L	
WF036	Aluminum	17.7 ug/L	All samples in SDG WF036
	Barium	0.8 ug/L	
	Beryllium	0.6 ug/L	
	Cadmium	0.8 ug/L	
	Chromium	0.9 ug/L	
	Cobalt	1.1 ug/L	
	Manganese	1.0 ug/L	
	Mercury	0.0265 ug/L	
	Thallium	2.4 ug/L	
	Vanadium	1.1 ug/L	
	Aluminum	18.4 ug/L	All samples in SDG WF036
	Barium	1.2 ug/L	
	Beryllium	0.8 ug/L	
	Cadmium	0.9 ug/L	
	Chromium	1.2 ug/L	
	Cobalt	1.1 ug/L	
	Manganese	1.3 ug/L	
	Mercury	0.0251 ug/L	
	Thallium	3.4 ug/L	
	Vanadium	1.8 ug/L	

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NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF036 cont.	Aluminum	14.7 ug/L	All samples in SDG WF036
	Barium	1.1 ug/L	
	Beryllium	0.8 ug/L	
	Cadmium	0.8 ug/L	
	Chromium	1.1 ug/L	
	Cobalt	1.1 ug/L	
	Manganese	1.2 ug/L	
	Mercury	0.0165 ug/L	
	Thallium	3.2 ug/L	
	Vanadium	1.7 ug/L	
	Barium	0.7 ug/L	All samples in SDG WF036
	Beryllium	0.7 ug/L	
	Cadmium	0.6 ug/L	
	Chromium	0.9 ug/L	
	Cobalt	0.8 ug/L	
	Manganese	1.0 ug/L	
	Mercury	0.0157 ug/L	
	Vanadium	1.2 ug/L	
	Aluminum	63.950 ug/L	All samples in SDG WF036
	Barium	0.730 ug/L	
	Chromium	0.490 ug/L	
	Manganese	0.430 ug/L	
	Mercury	0.014 ug/L	
	Potassium	1817.440 ug/L	
	Cyanide	-1.333 ug/L	
	Barium	1.0 ug/L	All samples in SDG WF036
	Beryllium	0.6 ug/L	
	Cadmium	0.6 ug/L	
	Chromium	0.9 ug/L	
	Cobalt	1.0 ug/L	
	Manganese	1.0 ug/L	
	Thallium	2.2 ug/L	
	Vanadium	1.2 ug/L	
	Aluminum	91.5 ug/L	All samples in SDG WF036
	Barium	0.9 ug/L	
	Beryllium	0.7 ug/L	
	Cadmium	0.7 ug/L	
	Chromium	0.9 ug/L	
	Cobalt	1.0 ug/L	
	Manganese	1.0 ug/L	
	Thallium	3.4 ug/L	
	Vanadium	1.2 ug/L	
WF037	Copper	6.4 ug/L	All samples in SDG WF037
	Aluminum	-19.5 ug/L	All samples in SDG WF037
	Barium	0.4 ug/L	
	Copper	4.4 ug/L	
	Barium	0.4 ug/L	All samples in SDG WF037
	Copper	6.6 ug/L	

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Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF037 cont.	Barium	25.130 ug/L	All samples in SDG WF037
	Beryllium	-0.830 ug/L	
	Calcium	129.890 ug/L	
	Copper	8.310 ug/L	
	Iron	8.680 ug/L	
	Magnesium	25.430 ug/L	
	Manganese	0.490 ug/L	
	Silver	2.970 ug/L	
	Sodium	84.450 ug/L	
	Vanadium	2.060 ug/L	
	Zinc	3.100 ug/L	
	Cyanide	-0.981 ug/L	
WF041	Cyanide	-0.6 ug/L	All samples in SDG WF041
	Barium	0.5 ug/L	All samples in SDG WF041
	Sodium	12.2 ug/L	All samples in SDG WF041
	Cyanide	-0.4 ug/L	
	Barium	0.7 ug/L	All samples in SDG WF041
	Sodium	16.3 ug/L	
	Beryllium	-1.010 ug/L	All samples in SDG WF041
	Calcium	133.200 ug/L	
	Copper	3.740 ug/L	
	Iron	9.490 ug/L	
	Lead	1.260 ug/L	
	Sodium	93.470 ug/L	
	Thallium	1.310 ug/L	
	Zinc	19.070 ug/L	
	Cyanide	-1.002 ug/L	
	Barium	-0.6 ug/L	All samples in SDG WF041
	Chromium	-2.9 ug/L	
	Copper	-1.7 ug/L	
	Magnesium	-22.9 ug/L	
	Silver	-2.8 ug/L	
	Vanadium	-3.0 ug/L	
	Copper	6.4 ug/L	All samples in SDG WF041
	Thallium	1.4 ug/L	
	Vanadium	-1.9 ug/L	
	Cobalt	8.9 ug/L	All samples in SDG WF041
	Thallium	1.6 ug/L	
	Cyanide	-0.4 ug/L	
	Beryllium	-0.830 ug/L	All samples in SDG WF041
	Calcium	105.800 ug/L	
	Iron	3.860 ug/L	
	Selenium	-3.230 ug/L	
	Sodium	15.150 ug/L	
	Vanadium	-2.240 ug/L	
	Zinc	0.940 ug/L	
	Selenium	-3.4 ug/L	All samples in SDG WF041
	Thallium	-1.3 ug/L	
	Lead	1.2 ug/L	All samples in SDG WF041
	Selenium	-2.6 ug/L	
	Cyanide	-0.4 ug/L	

Table XIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF041 cont.	Selenium Thallium	-3.1 ug/L 1.3 ug/L	All samples in SDG WF041
	Selenium Cyanide	-2.8 ug/L -0.5 ug/L	All samples in SDG WF041
	Thallium Cyanide	-1.0 ug/L -0.4 ug/L	All samples in SDG WF041
	Cyanide	0.4 ug/L	All samples in SDG WF041
	Cyanide	0.4 ug/L	All samples in SDG WF041
	Cyanide	0.4 ug/L	All samples in SDG WF041
WF045	Cyanide	-0.6 ug/L	All samples in SDG WF045
	Cyanide	-0.6 ug/L	All samples in SDG WF045
	Manganese	0.4 ug/L	All samples in SDG WF045
	Vanadium	1.8 ug/L	All samples in SDG WF045
	Beryllium Calcium Iron Sodium Vanadium Zinc Cyanide	-0.860 ug/L 136.80 ug/L 5.390 ug/L 32.780 ug/L -1.730 ug/L 3.340 ug/L -1.013 ug/L	All samples in SDG WF045
	Mercury	0.1 ug/L	All samples in SDG WF045
	Cyanide	-0.6 ug/L	All samples in SDG WF045
	Thallium Cyanide	1.1 ug/L -0.6 ug/L	All samples in SDG WF045
	Cyanide	-0.6 ug/L	All samples in SDG WF045
	Aluminum Barium Beryllium Calcium Iron Sodium Thallium Zinc Cyanide	17.320 ug/L 0.450 ug/L -0.550 ug/L 121.820 ug/L 6.770 ug/L 45.700 ug/L -1.390 ug/L 2.510 ug/L -0.899 ug/L	All samples in SDG WF045
	Beryllium Manganese Sodium	0.2 ug/L 0.5 ug/L 17.2 ug/L	OWG00401 OWG00201
	Beryllium Manganese Sodium Zinc	0.2 ug/L 0.7 ug/L 12.2 ug/L 1.0 ug/L	OWG00401 OWG00201

Table XIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF045 cont.	Barium	0.9 ug/L	OWG00401
	Beryllium	0.5 ug/L	OWG00201
	Chromium	3.0 ug/L	
	Manganese	1.0 ug/L	
	Sodium	19.9 ug/L	
	Thallium	1.2 ug/L	
	Vanadium	2.0 ug/L	
	Zinc	1.6 ug/L	
	Cyanide	-0.377 ug/L	OWG00401 OWG00201
	Beryllium	0.2 ug/L	OWG00401
	Sodium	11.0 ug/L	OWG00201
	Selenium	-2.2 ug/L	OWG00401 OWG00201
	Thallium	-1.0 ug/L	OWG00401 OWG00201
WF046	Beryllium	0.2 ug/L	All samples in SDG WF046
	Sodium	17.2 ug/L	
	Beryllium	0.2 ug/L	All samples in SDG WF046
	Mercury	0.040 ug/L	
	Sodium	12.2 ug/L	
	Beryllium	0.5 ug/L	All samples in SDG WF046
	Mercury	0.043 ug/L	
	Sodium	19.9 ug/L	
	Aluminum	17.320 ug/L	All samples in SDG WF046
	Barium	0.450 ug/L	
	Beryllium	-0.550 ug/L	
	Calcium	121.820 ug/L	
	Iron	6.770 ug/L	
	Sodium	45.700 ug/L	
	Thallium	-1.390 ug/L	
	Zinc	2.510 ug/L	
	Boron	-0.377 ug/L	
	Beryllium	0.2 ug/L	All samples in SDG WF046
	Sodium	11.0 ug/L	
WF047	Beryllium	0.2 ug/L	All samples in SDG WF047
	Manganese	0.5 ug/L	
	Mercury	0.1 ug/L	
	Sodium	17.2 ug/L	
	Beryllium	0.2 ug/L	All samples in SDG WF047
	Manganese	0.7 ug/L	
	Sodium	12.2 ug/L	
	Zinc	1.0 ug/L	
	Barium	0.9 ug/L	All samples in SDG WF047
	Beryllium	0.5 ug/L	
	Chromium	3.0 ug/L	
	Manganese	1.0 ug/L	
	Sodium	19.9 ug/L	
	Thallium	1.1 ug/L	
	Vanadium	2.0 ug/L	
	Zinc	1.6 ug/L	

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Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF047 cont.	Aluminum	17.320 ug/L	All samples in SDG WF047
	Barium	0.450 ug/L	
	Beryllium	-0.550 ug/L	
	Calcium	121.820 ug/L	
	Iron	6.770 ug/L	
	Sodium	45.700 ug/L	
	Thallium	-1.390 ug/L	
	Zinc	2.510 ug/L	
	Beryllium	0.2 ug/L	All samples in SDG WF047
	Sodium	11.0 ug/L	
	Selenium	-2.2 ug/L	All samples in SDG WF047
WF051	Barium	1.0 ug/L	All samples in SDG WF051
	Beryllium	0.2 ug/L	
	Chromium	3.4 ug/L	
	Copper	1.5 ug/L	
	Manganese	0.5 ug/L	
	Silver	2.8 ug/L	
	Vanadium	2.4 ug/L	
	Manganese	-0.5 ug/L	All samples in SDG WF051
	Mercury	0.04 ug/L	
	Vanadium	1.8 ug/L	
	Arsenic	1.1 ug/L	All samples in SDG WF051
	Mercury	0.04 ug/L	
	Selenium	-1.9 ug/L	
	Manganese	-0.5 ug/L	All samples in SDG WF051
	Mercury	0.07 ug/L	
	Beryllium	-0.800 ug/L	All samples in SDG WF051
	Calcium	140.860 ug/L	
	Iron	5.470 ug/L	
	Sodium	36.740 ug/L	
	Zinc	1.980 ug/L	
	Mercury	0.08 ug/L	All samples in SDG WF051
	Silver	-2.4 ug/L	
	Aluminum	16.800 ug/L	All samples in SDG WF051
	Barium	0.600 ug/L	
	Beryllium	-0.680 ug/L	
	Calcium	127.440 ug/L	
	Chromium	3.050 ug/L	
	Cobalt	2.850 ug/L	
	Copper	2.120 ug/L	
	Iron	10.740 ug/L	
	Manganese	0.690 ug/L	
	Silver	3.040 ug/L	
	Sodium	54.160 ug/L	
	Vanadium	2.700 ug/L	
	Zinc	2.710 ug/L	
	Calcium	42.0 ug/L	All samples in SDG WF051

Table XIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF051 cont.	Barium	0.6 ug/L	All samples in SDG WF051
	Beryllium	0.4 ug/L	
	Cobalt	2.6 ug/L	
	Copper	1.7 ug/L	
	Manganese	0.9 ug/L	
	Zinc	1.2 ug/L	
	Manganese	0.7 ug/L	All samples in SDG WF051
	Arsenic	-1.130 ug/L	All samples in SDG WF051
	Beryllium	-0.720 ug/L	
	Calcium	131.080 ug/L	
	Iron	12.060 ug/L	
	Zinc	4.540 ug/L	
	Lead	-1.3 ug/L	All samples in SDG WF051
	Lead	-1.4 ug/L	All samples in SDG WF051
	Magnesium	0.5 ug/L	
	Lead	-1.6 ug/L	All samples in SDG WF051
	Aluminum	18.640 ug/L	All samples in SDG WF051
	Barium	0.490 ug/L	
	Beryllium	-0.760 ug/L	
	Calcium	134.210 ug/L	
	Chromium	3.850 ug/L	
	Iron	35.410 ug/L	
	Manganese	0.500 ug/L	
	Sodium	35.200 ug/L	
	Zinc	2.300 ug/L	
	Lead	-2.0 ug/L	All samples in SDG WF051
	Vanadium	2.0 ug/L	
	Barium	0.9 ug/L	All samples in SDG WF051
	Beryllium	0.3 ug/L	
	Lead	-2.0 ug/L	
	Manganese	0.7 ug/L	
	Sodium	9.2 ug/L	
	Sodium	15.0 ug/L	All samples in SDG WF051
	Arsenic	-1.6 ug/L	All samples in SDG WF051
WF053	Aluminum	18.640 ug/L	All samples in SDG WF053
	Barium	0.490 ug/L	
	Beryllium	-0.760 ug/L	
	Calcium	134.210 ug/L	
	Chromium	3.850 ug/L	
	Iron	35.410 ug/L	
	Manganese	0.500 ug/L	
	Sodium	35.200 ug/L	
	Zinc	2.330 ug/L	

Table XIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF053 cont.	Barium	-0.760 ug/L	All samples in SDG WF053
	Calcium	138.650 ug/L	
	Chromium	3.750 ug/L	
	Copper	3.390 ug/L	
	Iron	14.500 ug/L	
	Manganese	0.490 ug/L	
	Nickel	8.370 ug/L	
	Sodium	42.790 ug/L	
	Zinc	2.940 ug/L	
	Aluminum	26.970 ug/L	All samples in SDG WF053
	Beryllium	-0.710 ug/L	
	Calcium	151.990 ug/L	
	Iron	16.430 ug/L	
	Manganese	0.580 ug/L	
	Silver	4.360 ug/L	
	Sodium	52.750 ug/L	
	Zinc	3.720 ug/L	
	Beryllium	-0.970 ug/L	All samples in SDG WF053
	Calcium	130.780 ug/L	
	Copper	1.480 ug/L	
	Iron	19.510 ug/L	
	Lead	-1.380 ug/L	
	Manganese	0.780 ug/L	
	Sodium	13.170 ug/L	
	Zinc	6.090 ug/L	
	Aluminum	52.990 ug/L	All samples in SDG WF053
	Arsenic	1.300 ug/L	
	Beryllium	-0.940 ug/L	
	Calcium	198.990 ug/L	
	Chromium	6.790 ug/L	
	Copper	2.230 ug/L	
	Iron	38.980 ug/L	
	Lead	-1.460 ug/L	
	Manganese	1.000 ug/L	
	Sodium	60.080 ug/L	
	Zinc	2.040 ug/L	
WF054	Mercury	0.1 ug/L	All samples in SDG WF054
	Mercury	0.1 ug/L	All samples in SDG WF054
	Mercury	0.1 ug/L	All samples in SDG WF054
	Beryllium	-0.980 ug/L	All samples in SDG WF054
	Calcium	110.890 ug/L	
	Iron	9.300 ug/L	
	Mercury	0.052 ug/L	
	Vanadium	-2.660 ug/L	
	Zinc	2.260 ug/L	

Table XIV
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Parameter	Concentration	Qualifier
WF022	**Client ID:** BKR01001		
	Laboratory ID: RB858002		
	Collection Date: 7/16/96		
	Type: Equipment rinsate		
	Sodium	43.4 ug/L	None
	Aluminum	55.9 ug/L	23.9U ug/L[1]
	Calcium	69.0 ug/L	None
	Iron	23.9 ug/L	43.4U ug/L[1]
	Magnesium	39.7 ug/L	None
	Mercury	0.10 ug/L	None
	Zinc	1.2 ug/L	1.2U ug/L[1]
WF022	**Client ID:** BKF01001		
	Laboratory ID: RB858010		
	Collection Date: 7/17/96		
	Type: Source blank		
	Sodium	61.3 ug/L	61.3U ug/L[1]
WF023	**Client ID:** 01R01101		
	Laboratory ID: RB887005		
	Collection Date: 7/23/96		
	Type: Equipment rinsate		
	Aluminum	13.3 ug/L	None
	Iron	10.8 ug/L	10.8U ug/L[1]
	Zinc	1.2 ug/L	1.2U ug/L[1]
	Cyanide	2.6 ug/L	None
WF024	**Client ID:** 15R01201		
	Laboratory ID: RB920005		
	Collection Date: 7/31/96		
	Type: Equipment rinsate		
	Aluminum	13.8 ug/L	13.8U ug/L[1]
	Iron	10.5 ug/L	10.5U ug/L[1]
	Sodium	55.4 ug/L	55.4U ug/L[1]
	Cyanide	2.6 ug/L	None
WF025	**Client ID:** 15R01301		
	Laboratory ID: RB956011		
	Collection Date: 8/7/96		
	Type: Equipment rinsate		
	Iron	5.3 ug/L	5.3U ug/L[1]
	Sodium	26.6 ug/L	None
	Zinc	1.8 ug/L	1.8U ug/L[1]
WF026	**Client ID:** 15R01401		
	Laboratory ID: RB980012		
	Collection Date: 8/14/96		
	Type: Equipment rinsate		
	Iron	14.8 ug/L	14.8U ug/L[1]
	Zinc	1.1 ug/L	1.1U ug/L[1]
	Cyanide	1.8 ug/L	None

Table XIV
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Parameter	Concentration	Qualifier
WF027	**Client ID:** 16R01501		
	Laboratory ID: RC016012		
	Collection Date: 8/21/96		
	Type: Equipment rinsate		
	Arsenic	0.50 ug/L	0.50U ug/L[1]
	Calcium	64.0 ug/L	64.0U ug/L[1]
	Lead	0.80 ug/L	None
	Sodium	26.9 ug/L	26.9U ug/L[1]
	Zinc	1.8 ug/L	None
WF028	**Client ID:** 11R01601		
	Laboratory ID: RC044016		
	Collection Date: 8/28/96		
	Type: Equipment rinsate		
	Calcium	67.2 ug/L	67.2U ug/L[1]
	Sodium	30.8 ug/L	30.8U ug/L[1]
	Cyanide	1.5 ug/L	None
WF029	**Client ID:** 13R01701		
	Laboratory ID: RC092008		
	Collection Date: 9/11/96		
	Type: Equipment rinsate		
	Calcium	66.4 ug/L	66.4U ug/L[1]
	Sodium	25.4 ug/L	25.4U ug/L[1]
	Zinc	1.8 ug/L	1.8U ug/L[1]
WF030	**Client ID:** 66R01801		
	Laboratory ID: RC121010		
	Collection Date: 9/18/96		
	Type: Equipment rinsate		
	Calcium	55.7 ug/L	55.7U ug/L[1]
	Iron	9.2 ug/L	9.2U ug/L[1]
	Selenium	0.68 ug/L	None
	Sodium	24.9 ug/L	24.9U ug/L[1]
	Zinc	2.0 ug/L	None
WF031	**Client ID:** 05R01901		
	Laboratory ID: MB928011		
	Collection Date: 9/25/96		
	Type: Equipment rinsate		
	Barium	0.34 ug/L	None
	Manganese	0.38 ug/L	None
	Mercury	0.06 ug/L	0.06U ug/L[1]
	Zinc	2.0 ug/L	None
WF032	**Client ID:** 06R02001		
	Laboratory ID: MC011006		
	Collection Date: 10/2/96		
	Type: Equipment rinsate		
	Barium	2.8 ug/L	2.8U ug/L[1]
	Chromium	2.5 ug/L	2.5U ug/L[1]
	Copper	2.9 ug/L	2.9U ug/L[1]
	Manganese	0.48 ug/L	0.48U ug/L[1]
	Mercury	0.01 ug/L	0.01U ug/L[1]
	Sodium	365 ug/L	None
	Zinc	3.0 ug/L	3.0U ug/L[1]
	Cyanide	1.4 ug/L	None

Table XIV
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Parameter	Concentration	Qualifier
WF033	**Client ID:** 66R02101		
	Laboratory ID: MC085007		
	Collection Date: 10/9/96		
	Type: Equipment rinsate		
	Barium	1.6 ug/L	1.6U ug/L[1]
	Beryllium	0.32 ug/L	0.32U ug/L[1]
	Chromium	0.55 ug/L	0.55U ug/L[1]
	Cobalt	0.84 ug/L	0.84U ug/L[1]
	Manganese	2.4 ug/L	2.4U ug/L[1]
	Potassium	777 ug/L	777U ug/L[1]
	Sodium	334 ug/L	334U ug/L[1]
	Vanadium	0.63 ug/L	0.63U ug/L[1]
	Zinc	1.4 ug/L	1.4U ug/L[1]
WF034	**Client ID:** 66R0201		
	Laboratory ID: MC153007		
	Collection Date: 10/16/96		
	Type: Equipment rinsate		
	Barium	0.56 ug/L	0.56 ug/L[1]
	Manganese	0.44 ug/L	0.44 ug/L[1]
	Mercury	0.02 ug/L	0.02 ug/L[1]
	Sodium	119 ug/L	119 ug/L[1]
	Zinc	2.2 ug/L	2.2 ug/L[1]
WF035	**Client ID:** 66R02301		
	Laboratory ID: MC214006		
	Collection Date: 10/23/96		
	Type: Equipment rinsate		
	Aluminum	30.7 ug/L	30.7 ug/L[1]
	Barium	1.3 ug/L	1.3 ug/L[1]
	Calcium	101 ug/L	101 ug/L[1]
	Manganese	0.94 ug/L	0.94 ug/L[1]
	Mercury	0.03 ug/L	0.03 ug/L[1]
	Sodium	100 ug/L	100 ug/L[1]
	Zinc	2.4 ug/L	2.4 ug/L[1]
WF036	**Client ID:** 54R02401		
	Laboratory ID: MC262007		
	Collection Date: 10/30/96		
	Type: Equipment rinsate		
	Aluminum	14.8 ug/L	14.8 ug/L[1]
	Barium	0.59 ug/L	0.59 ug/L[1]
	Chromium	0.48 ug/L	0.48 ug/L[1]
	Manganese	0.32 ug/L	0.32 ug/L[1]
	Potassium	756 ug/L	756 ug/L[1]
	Sodium	265 ug/L	None
	Zinc	1.4 ug/L	None
WF037	**Client ID:** 15F00201		
	Laboratory ID: MC424010		
	Collection Date: 12/2/96		
	Type: Source blank		
	Barium	1.2 ug/L	None
	Calcium	111 ug/L	None
	Copper	6.8 ug/L	None
	Manganese	0.43 ug/L	None
	Sodium	95.7 ug/L	None
	Zinc	2.6 ug/L	None

Table XIV
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Parameter	Concentration	Qualifier
WF041	**Client ID:** 35F00301		
	Laboratory ID: MD908002		
	Collection Date: 6/11/97		
	Type: Source blank		
	Barium	0.78 ug/L	None
	Calcium	164 ug/L	164U ug/L[1]
	Copper	10.3 ug/L	10.3U ug/L[1]
	Iron	35.6 ug/L	35.6U ug/L[1]
	Lead	1.0 ug/L	1.0U ug/L[1]
	Manganese	0.88 ug/L	None
	Sodium	129 ug/L	129U ug/L[1]
	Zinc	13.3 ug/L	13.3U ug/L[1]
WF041	**Client ID:** 35R03001		
	Laboratory ID: MD908003		
	Collection Date: 6/11/97		
	Type: Equipment rinsate		
	Barium	1.0 ug/L	None
	Calcium	165 ug/L	165U ug/L[1]
	Copper	4.9 ug/L	4.9U ug/L[1]
	Iron	10.7 ug/L	10.7U ug/L[1]
	Manganese	1.2 ug/L	None
	Sodium	148 ug/L	148U ug/L[1]
	Thallium	1.7 ug/L	1.7U ug/L[1]
	Zinc	15.8 ug/L	15.8U ug/L[1]
WF045	**Client ID:** OWR03401		
	Laboratory ID: ME149002		
	Collection Date: 7/7/97		
	Type: Equipment rinsate		
	Barium	0.44 ug/L	0.44U ug/L[1]
	Calcium	133 ug/L	133U ug/L[1]
	Copper	1.8 ug/L	None
	Iron	7.1 ug/L	7.1U ug/L[1]
	Sodium	60.4 ug/L	60.4U ug/L[1]
	Zinc	1.7 ug/L	1.7U ug/L[1]
WF046	**Client ID:** 31R03301		
	Laboratory ID: MW241002		
	Collection Date: 7/15/97		
	Type: Equipment rinsate		
	Barium	1.1 ug/L	1.1U ug/L[1]
	Calcium	126 ug/L	126U ug/L[1]
	Iron	4.4 ug/L	4.4U ug/L[1]
	Manganese	0.40 ug/L	None
	Sodium	65.6 ug/L	65.6U ug/L[1]
	Zinc	5.4 ug/L	5.4U ug/L[1]

Table XIV
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Parameter	Concentration	Qualifier
WF051	**Client ID:** 16R03601		
	Laboratory ID: ME340005		
	Collection Date: 7/23/97		
	Type: Equipment rinsate		
	Calcium	166 ug/L	166U ug/L[1]
	Copper	1.7 ug/L	1.7U ug/L[1]
	Iron	12.7 ug/L	12.7U ug/L[1]
	Lead	1.2 ug/L	None
	Manganese	0.68 ug/L	0.68U ug/L[1]
	Sodium	48.9 ug/L	48.9U ug/L[1]
	Zinc	2.6 ug/L	2.6U ug/L[1]
WF053	**Client ID:** 15R03701		
	Laboratory ID: ME367002		
	Collection Date: 7/27/97		
	Type: Equipment rinsate		
	Barium	1.6 ug/L	None
	Calcium	134 ug/L	134U ug/L[1]
	Chromium	4.2 ug/L	4.2U ug/L[1]
	Copper	2.1 ug/L	2.1U ug/L[1]
	Iron	18.4 ug/L	None
	Manganese	0.69 ug/L	0.69U ug/L[1]
	Sodium	83.0 ug/L	83.0U ug/L[1]
	Zinc	5.0 ug/L	5.0U ug/L[1]
WF054	**Client ID:** 15R03801		
	Laboratory ID: ME441005		
	Collection Date: 8/5/97		
	Type: Equipment rinsate		
	Cadmium	4.7 ug/L	
	Calcium	159 ug/L	159U ug/L[1]
	Copper	1.3 ug/L	None
	Iron	13.3 ug/L	13.3U ug/L[1]
	Manganese	0.48 ug/L	None
	Mercury	0.05 ug/L	0.05U ug/L[1]
	Sodium	20.0 ug/L	None
	Zinc	1.8 ug/L	None
WF054	**Client ID:** 30R03901		
	Laboratory ID: ME450002		
	Collection Date: 8/6/97		
	Type: Equipment rinsate		
	Aluminum	16.7 ug/L	None
	Barium	0.78 ug/L	None
	Calcium	150 ug/L	150U ug/L
	Copper	3.7 ug/L	None
	Iron	14.0 ug/L	14.0U ug/L
	Manganese	0.58 ug/L	None
	Sodium	67.0 ug/L	None
	Zinc	4.4 ug/L	None

[1] = sample result was modified based on an associated method blank concentration.

Note: see detailed data validation report for the discrete qualifiers.

Table XV
Sample Event PARCC Summary
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton, Florida

SDG	Fraction	Precision[1]	Accuracy[2]	Representativeness	Completeness (%)	Comparability
WF022	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF023	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF024	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF025	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF026	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF027	Volatiles	Acceptable	Acceptable	Acceptable	99.0	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF028	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF029	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF030	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF031	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	**Unacceptable**	Acceptable	**0**	Acceptable
WF031B	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF032	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	99.3	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable

Table XV
Sample Event PARCC Summary
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton, Florida

SDG	Fraction	Precision[1]	Accuracy[2]	Representativeness	Completeness (%)	Comparability
WF033	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF034	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF035	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF036	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF037	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	**Unacceptable**	Acceptable	**0**	Acceptable
WF038	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
WF039	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
WF040	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
WF041	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides & PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF042	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
WF043	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
WF044	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
WF045	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides & PCBs	**Unacceptable**	**Unacceptable**	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF046	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides & PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF047	Volatiles	Acceptable	Acceptable	Acceptable	97.0	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
WF048	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
WF049	Volatiles	Acceptable	Acceptable	Acceptable	95.2	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
WF051	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
WF052	Volatiles	Acceptable	Acceptable	Acceptable	94.3	Acceptable

Table XV
Sample Event PARCC Summary
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton, Florida

SDG	Fraction	Precision[1]	Accuracy[2]	Representativeness	Completeness (%)	Comparability
WF053	Volatiles Metals	Acceptable Acceptable	Acceptable Acceptable	Acceptable Acceptable	100 100	Acceptable Acceptable
WF054	Volatiles Metals	Acceptable Acceptable	Acceptable Acceptable	Acceptable Acceptable	100 100	Acceptable Acceptable
WF055	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable

[1]Cumulative of sampling and analytical components
[2]Analytical component.
[3]Samples results rejected for database purposes were not used in the completeness calculation.

Notes: All completeness is expressed as the ratio of number of sample results considered usable (i.e., not qualified as rejected) to the total number of sample results.

% = *percent*

APPENDIX F

HUMAN HEALTH RISK DATA

Aluminum. Aluminum occurs naturally in the soil and makes up approximately 8 percent of the Earth's crust. Higher soil concentrations are associated with industries which burn coal and aluminum mining and smelting. Human exposures to aluminum may occur through ingestion of foods grown in soil that contain aluminum and the use of antacids, antiperspirants, and other drug store items. Aluminum in antiperspirants can cause skin rashes in some people. Factory workers who inhale large amounts of aluminum dust may develop lung problems. Aluminum has caused lower birth weights in some animals. Studies have shown that aluminum accumulates in the brains of people with Alzheimer's disease. However, any causal link between aluminum exposure and this disease is yet to be demonstrated. Both human epidemiological studies and animal experiments strongly suggests that aluminum is not a carcinogen.

References:
Agency for Toxic Substances and Disease Registry (ATSDR), 1989. "Toxicological Profile for Aluminum"; Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, October 1989.

Arsenic. Arsenic has been used in pesticide formulations and has industrial uses in tanneries, as well as the glass and wine making industries. Toxicity depends on its chemical form. Arsenic is an irritant of the skin, mucous membranes, and gastrointestinal tract. Symptoms of acute toxicity include vomiting, diarrhea, convulsions, and a severe drop in blood pressure. Subchronic effects include hyperpigmentation, sensory-motor polyneuropathy, persistent headache, and lethargy. Chronic oral exposure has caused skin lesions, peripheral vascular disease, and peripheral neuropathy. The USEPA has classified arsenic in Group A, human carcinogen, based on increased incidence of lung cancer in occupational studies.

References:
Agency for Toxic Substances and Disease Registry (ATSDR), 1992. "Toxicological Profile for Arsenic"; Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, February 1992.

Iron. Iron is a metal which is required for a variety of physiological functions such as heme biosynthesis, oxidative phosphorylation and mixed-function oxidase-mediated metabolic reactions. Only divalent forms of iron are absorbed. As absorption occurs, divalent iron is biochemically converted to trivalent iron, the biologically active form. Under normal conditions, absorbed dietary iron is complexed to hemoglobin and transported to the liver for storage until needed for physiological reactions. The balance of iron is regulated only by the amount of dietary intake and the degree of intestinal absorption. Intestinal absorption tends to be low (2 - 15%) except during periods of increased iron need when absorption efficiency increases dramatically.

Acute iron toxicity has been well characterized following the accidental ingestion of iron-containing preparations by children. Shortly after ingestion, the corrosive effects of iron cause vomiting and diarrhea, often bloody. Later signs include shock, metabolic acidosis, seizures, liver and/or kidney failure, coma, and death. Chronic iron overload manifests as disturbances in liver function, diabetes mellitus, and endocrine and cardiovascular effects. Inhalation of iron containing dust or fumes in occupational settings may result in deposition of iron particles in the lungs leading to interstitial fibrosis. Autopsies of hematite miners noted an increase in lung cancer. However, the

etiology of the lung cancer may be related to factors other than iron exposure such as cigarette, silica, or PAH exposures.

References:
Aisen, P., Cohen, G. and Kang, J.O., 1990. Iron Toxicosis. Int. Rev. Exp. Pathol. 31:1-46.

Goyer, R.A., 1991. Toxic Effects of Metals. In: Casarett and Doull's Toxicology: The Basic Science of Poisons, 3rd edition. Eds. C.D. Klaassen, M.O. Amdur and J. Doull. Macmillan Publishing Co. N.Y.

Manganese. Manganese is a naturally occurring substance found in many types of rock. It does not generally occur in the environment as the pure metal, rather, it is found combined with other chemicals such as sulfur, oxygen, and chlorine. Manganese is mixed with iron to make various types of steel. Manganese is a component of some ceramics, pesticides, fertilizers, and in nutritional supplements. In small doses manganese is beneficial to human health. Manganese miners and steel workers exposed to elevated concentrations of manganese have evidenced mental and emotional disturbances, and slow and clumsy body movements. Target organs of manganese are the lung and CNS. When inhaled, manganese dust can also cause lung irritation. EPA has classified manganese as a Class D, not classifiable as to human carcinogenicity.

References:
Agency for Toxic Substances and Disease Registry (ATSDR), 1991. "Toxicological Profile for Manganese"; Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, February 1991.

Trichloroethene. Trichloroethene is a man-made chlorinated solvent that is used extensively in industry as a metal decreasing agent. Trichloroethene is also used in dry cleaning and as a solvent in paints and adhesives.

Several human deaths and acute neurotoxic effects have been attributed to oral and inhalation exposure to trichloroethene. In animals, oral and inhalation exposure to trichloroethene have produce neurotoxic effects, including behavioral changes, and renal toxicity. Additionally, inhalation and oral exposures to trichloroethene in animals have produced lung, liver, and testicular cancers. Epidemiological data in humans is insufficient to conclude whether or not trichloroethene is a human carcinogen. However, studies on trichloroethene metabolism suggest that it is metabolized similarly in humans and laboratory animals. Therefore, the USEPA has place trichloroethene in weight-of-evidence group B2, probable human carcinogen.

References:
MADEP, 1992. "Risk Assessment Shortform Residential Exposure Scenario, Version 1.6"; Policy #WSC/ORS-142-92; Office of Research and Standards and the Bureau of Waste Site Cleanup, Boston, MA; September 1992.

Vanadium. Vanadium is widely, but sparsely, distributed in the Earth's crust and in the environment. It is invaluable as an alloying agent with steel; ferrovanadium alloys are used in high-stress applications such as bearings, jet engines, and cutting tools. Human and animal studies indicate that vanadium is readily absorbed from the lungs and poorly absorbed from the gastrointestinal tract. It distributes primarily to the bone and kidney. Vanadium is a

respiratory irritant. Inhalation of vanadium dusts in both animals and occupationally-exposed workers induces mild to moderate respiratory irritation. The effects are reversible and subside when exposure is discontinued. No studies were located regarding cancer in humans or animals following inhalation, oral, or dermal exposures. However, vanadium has been found to induce DNA damage in human cell cultures, suggesting that vanadium may have the potential to be genotoxic to humans.

References:

ATSDR, 1990. Toxicological Profile for Vanadium. Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, October, 1990.

Table F-1
Screening Concentrations for Surface Soil for Selection of Chemicals of Potential Concern

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Chemical	Risk Based Screening Concentration[1]	Florida Cleanup Target Level[2]	Florida Cleanup Target Level Based on Leaching	Selected Screening Concentration[3]
Volatile Organic Compounds (µg/kg)				
Methylene chloride	85,000	16,000	20	16,000
Semivolatile Organic Compounds (µg/kg)				
bis(2-Ethylhexyl)phthalate	46,000	76,000	3,600,000	46,000
Fluoranthene	310,000	2,900,000	1,200,000	310,000
Pyrene	230,000	2,200,000	880,000	230,000
Inorganic Analytes (mg/kg)				
Aluminum	7,800	72,000	NSC	7,800
Arsenic	[4]0.43	0.8	29	0.43
Barium	550	110	1,600	110
Beryllium	16	120	63	16
Calcium	[5]1,000,000	NSC	NSC	1,000,000
Chromium	[6]23	[6]210	38	23
Cobalt	470	4,700	NSC	470
Copper	310	110	NSC	110
Iron	2,300	23,000	NSC	2,300
Lead	[7]400	400	NSC	400
Magnesium	[5]460,468	NSC	NSC	460,468
Manganese	160	1,600	NSC	160
Mercury	2.3	5.4	2.1	2.3
Nickel	160	110	130	110
Potassium	[5]1,000,000	NSC	NSC	1,000,000
Selenium	39	390	5	39
Silver	39	390	17	39
Sodium	[5]1,000,000	NSC	NSC	1,000,000

See notes at end of table.

Table F-1 (Continued)
Screening Concentrations for Surface Soil for Selection of Chemicals of Potential Concern

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Chemical	Risk Based Screening Concentration[1]	Florida Cleanup Goal[2]	Florida Cleanup Goal Based on Leaching	Selected Screening Concentration[3]
Inorganic Analytes (mg/kg) (Continued)				
Vanadium	55	15	6,000	15
Zinc	2,300	23,000	12,000	2,300

[1] For all chemicals except the essential nutrients, the USEPA Region III Risk Based Concentration (RBC) Table for residential soil (October 1998) has been used, unless otherwise noted. Screening values are based on a cancer risk of 10^{-6} or a hazard quotient of 1.0. Noncarcinogenic RBCs have been adjusted to reflect a target hazard quotient of 0.1.
[2] Chapter 62-777, Florida Administrative Code, June 1999.
[3] The selected screening concentration for the human health risk assessment is the lowest value of the RBC and the Florida Soil Cleanup Target Level. For analytes that selected as an HHCPC in groundwater, the Florida Soil Cleanup Target Level based on Leaching is selected as the screening concentration.
[4] RBC value is based on arsenic as a carcinogen.
[5] Essential nutrient screening value (GIR Report, Appendix C).
[6] RBC and Florida Soil Cleanup Target Level values are based on Chromium VI.
[7] RBC is not available for lead; value is from Revised Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites (OSWER Directive 9355.4-12).

Notes: µg/kg = micrograms per kilogram.
mg/kg = milligrams per kilogram.
NSC = no screening criteria available.

Table F-2
Screening Concentrations for Subsurface Soil for Selection of Chemicals of Potential Concern

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Risk-Based Screening Concentration[1]	Florida Cleanup Target Level[2]	Florida Cleanup Target Level Based on Leaching[2]	Selected Screening Concentration[3]
Volatile Organic Compounds (µg/kg)				
Acetone	20,000,000	5,500,000	2,800	5,500,000
2-Butanone	120,000,000	21,000,000	17,000	21,000,000
2-Hexanone	8,200,000	34,000	1,400	34,000
4-Methyl-2-pentanone	16,000,000	1,500,000	2,600	1,500,000
Carbon disulfide	20,000,000	1,400,000	5,600	1,400,000
Toluene	41,000,000	2,600,000	500	2,600,000
Xylenes (total)	410,000,000	40,000,000	200	40,000,000
Semivolatile Organic Compounds (µg/kg)				
4-Methylphenol	1,000,000	3,000,000	30	1,000,000
Diethylphthalate	160,000,000	920,000,000	86,000	160,000,000
Naphthalene	4,100,000	270,000	1,700	270,000
Phenol	120,000,000	390,000,000	50	120,000,000
bis(2-Ethylhexyl)phthalate	410,000	280,000	3,600,000	280,000
Inorganic Analytes (mg/kg)				
Aluminum	100,000	1,000,000	NSC	100,000
Antimony	82	240	5	82
Arsenic	[4] 3.8	3.7	29	3.7
Barium	14,000	87,000	1,600	14,000
Beryllium	410	820	63	410
Calcium	[5] 1,000,000	NSC	NSC	1,000,000
Chromium	[6] 1,000	[6] 420	38	420
Cobalt	610	110,000	NSC	610
Copper	8,200	78,000	NSC	8,200
Cyanide	4,100	28,000	40	4,100
Iron	61,000	NSC	NSC	61,000
Lead	[7]400	920	NSC	400
Magnesium	[5]460,468	NSC	NSC	460,468
Manganese	4,100	22,000	NSC	4,100
Mercury	61	8.7	2.1	8.7
Nickel	4,100	28,000	130	4,100

See notes at end of table.

Table F-2 (Continued)
Screening Concentrations for Subsurface Soil for Selection of Chemicals of Potential Concern

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Risk-Based Screening Concentration[1]	Florida Cleanup Target Level[2]	Florida Cleanup Target Level Based on Leaching[2]	Selected Screening Concentration[3]
Inorganic Analytes (mg/kg) (Continued)				
Potassium	[5]1,000,000	NSC	NSC	1,000,000
Silver	1,000	9,100	17	1,000
Sodium	[5]1,000,000	NSC	NSC	1,000,000
Vanadium	1,400	7,400	6,000	1,400
Zinc	61,000	560,000	12,000	61,000

[1] For all chemicals except the essential nutrients, the USEPA Region III Risk Based Concentration (RBC) Table for industrial soil (October 1998) has been used, unless otherwise noted. Screening values are based on a cancer risk of 10^{-6} or a hazard quotient of 1.0. Noncarcinogenic RBCs have been adjusted to reflect a target hazard quotient of 0.1.
[2] Chapter 62-777, Florida Administrative Code, June 1999.
[3] The selected screening concentration for the human health risk assessment is the lowest value of the RBC and the Florida Soil Cleanup Target Level. For analytes that selected as an HHCPC in groundwater, the Florida Soil Cleanup Target Level based on Leaching is selected as the screening concentration.
[4] RBC value is based on arsenic's as a carcinogen.
[5] Essential nutrient screening value (see GIR Report).
[6] RBC and Florida Soil Cleanup Target Levels values are based on Chromium VI.
[7] RBC is not available for lead; value is from Revised Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites (OSWER Directive 9355.4-12).

Notes: µg/kg = micrograms per kilogram.
mg/kg = milligrams per kilogram.
NSC = no screening criteria available.

Table F-3
Screening Concentrations for Groundwater
For Selection of Chemicals of Potential Concern

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Chemical	Risk-Based Screening Concentration[1]	Federal MCL[2]	Florida Groundwater Cleanup Target Levels[3]	Selected Screening Concentration[4]
Volatile Organic Compounds (µg/ℓ)				
1,1-Dichloroethane	80	NSC	700	80
1,2-Dichloroethene (total)	5.5	[5]70	[5]70	5.5
Carbon Disulfide	100	NSC	700	100
Tetrachloroethene	1.1	5	3	1.1
Trichloroethene	1.6	5	3	1.6
Inorganic Analytes (µg/ℓ)				
Aluminum	3,700	(50-200)	(200)	50
Arsenic	0.045	50	50	0.045
Barium	260	2,000	2,000	260
Calcium	[6]1,055,398	NSC	NSC	1,055,398
Copper	150	[7]1,300 (1,000)	(1,000)	150
Cyanide	[8]73	200	200	73
Iron	1,100	(300)	(300)	300
Lead	NSC	[9]15	15	15
Magnesium	[6]118,807	NSC	NSC	118,807
Manganese	73	(50)	(50)	50
Potassium	[6]297,016	NSC	NSC	297,016
Selenium	18	50	50	18
Sodium	[6]396,022	NSC	160,000	160,000
Zinc	1,100	(5,000)	(5,000)	1,100

See notes at end of table.

Table F-3 (Continued)
Screening Concentrations for Groundwater
For Selection of Chemicals of Potential Concern

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

[1] For all chemicals except the essential nutrients, the USEPA Region III Risk Based Concentration (RBC) Table for tap water (October 1998) has been used. Screening values are based on a cancer risk of 10^{-6} and a hazard quotient of 1. Per USEPA Region IV Guidance (USEPA, 1995), the noncarcinogenic RBCs have been adjusted to reflect a target hazard quotient of 0.1.
[2] Federal MCLs are taken from USEPA Drinking Water Regulations and Health Advisories from October 1996. Primary MCLs have no marks, Secondary MCLs are indicated by parentheses ( ), and Federal maximum contaminant level goals (MCLGs) are indicated by brackets [ ]. The lowest of these nonzero values is presented.
[3] Florida Department of Environmental Protection Groundwater Cleanup Target Levels, from Chapter 62-777, Florida Administrative Code, June 1999. Primary Standards have no marks, Secondary Standards are indicated by parentheses ( ), and other criteria (i.e., carcinogen, organoleptic, or a systemic toxicant) are indicated by brackets [ ].
[4] The selected screening concentration for the human health risk assessment is the lowest value of the RBC, Federal MCL value, and Florida Cleanup Target Level values.
[5] MCL and Florida Groundwater Cleanup Target Level values are based on the cis-1,2-dichloroethene isomer.
[6] Essential nutrient screening value (see GIR Report).
[7] Treatment technology action level for copper in drinking water distribution system (USEPA Drinking Water Standards and Health Advisories May 1996).
[8] RBC value is based on hydrogen cyanide.
[9] Treatment technology action level for lead in drinking water (USEPA Drinking Water Standards and Health Advisories, May 1996).

Notes: MCL = maximum contaminant level.
$\mu g/\ell$ = micrograms per liter.
NSC = not presented in available guidance.

Table F-4
Oral Dose-Response Data for Carcinogenic Effects

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Chemical	Weight of Evidence	Oral Slope Factor (mg/kg/day)(-1)	Source	Test Species	Exposure Route	Tumor Type	Study Source
Volatile Organic Compounds							
Trichloroethylene	B2	1.1e-02	(1)				
Inorganic Analytes							
Aluminum	D	NE					
Arsenic	A	1.5e+00	IRIS	Human	Oral-drinking water	Skin	IRIS
Iron	D	NE					
Manganese	D	NE					
Vanadium	D	NE					

[1] This value was provided by the Environmental Criteria and Assessment Office of the U.S.Environmental Protection Agency in response to a specific request.

Notes:
Integrated Risk Information System (IRIS)

Weight of Evidence (route-specific):
A = Human carcinogen
B = Probable human carcinogen (B1 = limited human evidence; B2 = sufficient human evidence)
C = Possible human carcinogen
D = Not classifiable as to human carcinogenicity

mg/kg-day = milligrams per kilogram per day.
NE = not evaluated.
IRIS = Integrated Risk Information System (on-line database search, current as of November 1997).

Table F-5
Dermal Dose-Response Data for Carcinogenic Effects

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Compound	Weight of Evidence	Oral Slope Factor (mg/kg-day)-1	Oral Absorption Efficiency (Percent)	Reference	Dermal Slope Factor (mg/kg-day)-1
Volatile Organic Compounds					
Trichloroethylene	B2	1.1e-02	100	Prout et al., 1985	1.1e-02
Inorganic Analytes					
Aluminum	D	NE			NE
Arsenic	A	1.5e+00	98	Vahter, 1983	1.5e+00
Iron	D	NE			NE
Manganese	D	NE			NE
Vanadium	D	NE			NE

Ref: Prout, M.S., Provan, W.M. and Green, T. 1985. Species Differences in Response to Trichloroethylene. Toxicol. Appl. Pharmacol. 79: 389-400.
Vahter, M. 1983. Metabolism of Arsenic. In: Fowler, B.A., ed. Biological and Environmental Effect of Arsenic. NY: Elsevier. pp. 171-198.

Notes:
Weight of Evidence (route-specific):
- A = Human carcinogen
- B = Probable human carcinogen (B1 = limited human evidence; B2 = sufficient human evidence)
- C = Possible human carcinogen
- D = Not classifiable as to human carcinogenicity

mg/kg-day = milligrams per kilogram per day.
NE = not evaluated.

Table F-6
Inhalation Dose-Response Data for Carcinogenic Effects

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Chemical	Weight of Evidence	Inhalation Slope Factor (mg/kg/day)(-1)	Source	Inhalation Unit Risk ($\mu g/m^3$)(-1)	Source	Test Species	Exposure Route	Tumor Type	Study Source
Volatile Organic Compounds									
Trichloroethylene	B2	6.0e-03	(1)	1.7e-06	(1)				
Inorganic Analytes									
Aluminum	D	NE		NE					
Arsenic	A	1.5e+01	HEAST	4.3e-03	IRIS	Human	Inhalation	Lung	IRIS
Iron	D	NE		NE					
Manganese	D	NE		NE					
Vanadium	D	NE		NE					

[1] This value was provided by the Environmental Criteria and Assessment Office of the U.S.Environmental Protection Agency in response to a specific request.

Notes:
Weight of Evidence (route-specific):
- A = Human carcinogen.
- B = Probable human carcinogen (B1 = limited human evidence; B2 = sufficient human evidence).
- C = Possible human carcinogen.
- D = Not classifiable as to human carcinogenicity.

mg/kg-day = milligrams per kilogram per day.
$\mu g/m^3$ = micrograms per cubic meter.
NE = not evaluated.
IRIS = Integrated Risk Information System (on-line database search, current as of February 1998).
HEAST = Health Effects Assessment Summary Tables (current as of July 1997).

Table F-7
Oral Dose-Response Data for Noncarcinogenic Effects

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Chemical	Chronic		Subchronic		Study Type	Confidence Level	Critical Effect	Test Animal	Uncertainty Factor	Study Source
	Oral RfD (mg/kg-day)	Source	Oral RfD (mg/kg-day)	Source						
Volatile Organic Compounds										
Trichloroethylene	6.0e-03	(1)	ND							
Inorganic Analytes										
Aluminum	1.0e+00	(1)	ND							
Arsenic	3.0e-04	IRIS	3.0e-04	HEAST	Oral-drinking water	Medium	Hyperpigmentation, keratosis	Human	3 D	IRIS
Iron	3.0e-01	(1)	ND							
Manganese										
Food	1.4e-01	IRIS	1.4e-01	HEAST	Oral-diet	NA	CNS effects	Human	1	IRIS
All other media	4.7e-02	IRIS	ND		Oral-diet	NA	CNS effects	Human	3 M	IRIS
Vanadium	7.0e-03	HEAST	7.0e-03	HEAST	Oral-drinking water	Low	No effects observed	Rat	100 H,A	HEAST

[1] This value was provided by the Environmental Criteria and Assessment Office (ECAO) of the USEPA in response to a specific request.

Notes:
Uncertainty factors:
- H = Variation in human sensitivity.
- A = Animal to human extrapolation.
- S = Extrapolation from subchronic to chronic no observable adverse effects level (NOAEL).
- L = Extrapolation from lowest observed adverse effects level to NOAEL.
- D = Inadequate data.
- M = Modifying factor.

RfD = reference dose.
mg/kg-day = milligrams per kilogram per day.
ND = no data.
IRIS = Integrated Risk Information System (on-line database search, current as of November 1997).
HEAST = Health Effects Assessment Summary Tables (current as of July 1997).
NA = not applicable.
CNS = central nervous system.

Table F-8
Dermal Dose-Response Data for Noncarcinogenic Effects

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Chemical	Chronic Oral RfD (mg/kg-day)	Subchronic Oral RfD (mg/kg-day)	Oral Absorption Efficiency (Percent)	Reference	Dermal Chronic RfD (mg/kg-day)	Dermal Subchronic RfD (mg/kg-day)
Volatile Organic Compounds						
Trichloroethylene	6.0e-03	ND	100	Prout et al., 1985	6.0e-03	ND
Inorganic Analytes						
Aluminum	1.0e+00	ND	20		2.0e-01	ND
Arsenic	3.0e-04	3.0e-04	98	Vahter, 1983	2.9e-04	2.9e-04
Iron	3.0e-01	ND	2	Goyer, 1991	6.0e-03	ND
Manganese	4.7e-02	ND	4	ATSDR, 1991b	1.9e-03	ND
Vanadium	7.0e-03	7.0e-03	3	ATSDR, 1991c	2.1e-04	2.1e-04

Ref:
ATSDR. 1991a. "Toxicological Profile for Antimony". Agency for Toxic Substances and Disease Registry, U.S. Public Health Service (Draft).
ATSDR. 1991b. "Toxicological Profile for Manganese". Agency for Toxic Substances and Disease Registry, U.S. Public Health Service (Draft).
ATSDR. 1991c. "Toxicological Profile for Vanadium". Agency for Toxic Substances and Disease Registry, U.S. Public Health Service (Draft).
Goyer, R.A. 1991. Toxic Effects of Metals. In: Cassarett and Doull's Toxicology: The Basic Science of Poisons, 4th edition. Eds. M.O. Amdur, J. Doull and C.D. Klaassen. Pergamon Press, N.Y.
Prout, M.S., W.M. Provan, and T. Green. 1985. Species Differences in Response to Trichloroethylene. Toxicol. Appl. Pharmacol. 79: 389-400.
Vahter, M. 1983. Metabolism of Arsenic. In: Fowler, B.A., ed. Biological and Environmental Effect of Arsenic. NY: Elsevier. pp. 171-198.

Notes:
Weight of Evidence (route-specific):
A = Human carcinogen.
B = Probable human carcinogen (B1 = limited human evidence; B2 = sufficient human evidence).
C = Possible human carcinogen.
D = Not classifiable as to human carcinogenicity.

RfD = reference dose.
mg/kg-day = milligrams per kilogram per day.
ND = no data.
ATSDR = Agency for Toxic Substances and Disease Registry.

Table F-9
Inhalation Dose-Response Data for Noncarcinogenic Effects

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Chemical	Chronic		Subchronic		Study Type	Confidence Level	Critical Effect	Test Animal	Uncertainty Factor	Study Source
	RfD (mg/kg/day)	Source	RfD (mg/kg/day)	Source						
Volatile Organic Compounds										
Trichloroethylene	ND		ND							
Inorganic Analytes										
Aluminum	ND		ND							
Arsenic	ND		ND							
Iron	ND		ND							
Manganese	1.4e-05	IRIS	ND		Inhalation	Medium	Impaired neurobehavioral function	Human	1,000 H,L,D	IRIS
Vanadium	ND		ND							

Notes:
Uncertainty factors:
A = Animal to human extrapolation.
H = Variation in human sensitivity.
S = Extrapolation from subchronic to chronic no observable adverse effects level (NOAEL).
L = Extrapolation from lowest observed adverse effects level to NOAEL.
D = Inadequate data.
M = Modifying factor.

RfD = reference dose.
mg/kg-day = milligrams per kilogram per day.
ND = no data.
IRIS = Integrated Risk Information System (on-line database search, current as of November 1997.

APPENDIX G

ECOLOGICAL RISK DATA

Table G-1
Summary of Bioaccumulation Data

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Bioaccumulation Factor [a]				
	Log K_{ow} [b]	Invertebrate [c]	Plant [d]	Mammal [e]	Bird [f]
Volatile Organic Compounds					
Methylene chloride	1.3	NA	NA	NA	NA
Semivolatile Organic Compounds					
bis(2-Ethylhexyl)phthalate	5.1	5.0E-01	8.7E02	1.9E-00	NA
Inorganic Analytes					
Aluminum	NA	7.5E-01 [g]	8.0E-03 [h]	7.5E-01 [i]	NA
Chromium	NA	1.6E-01[j]	1.5E-03[h]	2.8E-01[i]	NA
Manganese	NA	2.0E-01 [g]	5.0E-01 [h]	2.0E-01 [i]	NA
Vanadium	NA	1.2E-00 [g]	1.1E-02 [h]	1.2E-00 [i]	NA

[a] Units for bioaccumulation factors (BAFs) are mg/kg (fresh) tissue weight over mg/kg (dry) soil weight for invertebrates and plants. The BAF units for small mammals and small birds are mg/kg (fresh) tissue weight over mg/kg (fresh) food weight. No BAFs were calculated for volatile organic compounds because available evidence suggests that these analytes do not bioaccumulate (Suter, 1993, Maughan, 1993).
[b] Log K_{ow} values are from the Superfund Chemical Data Matrix (USEPA, 1993), unless otherwise noted.
[c] The value is an average BAF for semivolatiles measured in earthworms (Beyer, 1990) , unless otherwise noted. Dry weight values were converted to wet weight assuming earthworm are 80% water ($BAF_{weight\ weight} = BAF_{dry\ weight} / 0.2$).
[d] Plant BAF were calculated using the following equation presented by Travis and Arms (1988) unless otherwise noted: log (Plant Bioaccumulation Factor) = 1.588-0.578 (log K_{ow}). The calculated plant BAF value was converted from dry weight to wet weight by dividing the BAF by a factor of 0.2 (assuming 80% water content of plants) ($BAF_{weight\ weight} = BAF_{dry\ weight} / 0.2$).
[e] Mammalian BAFs were calculated using the following equation from Travis and Arms (1988), unless otherwise noted: log BTF (biotransfer factor) = Log K_{ow} - 7.6. To convert from BTF to BAF, the calculated log BTF is first transformed to base 10 than multiplied by the average ingestion rates for nonlactating and lactating test animals (12 kg/day). BAFs are convert from dry to wet feed weight by divided the BAF by a factor of 0.2 ($BAF_{wet\ weight}$ = BTF *12 mg/day/0.2).
[f] Bioaccumulation data are generally lacking for birds. Therefore, there is uncertainty associated with estimating body doses for birds without considering what chemicals may have bioacumulated in prey-item tissue.
[g] A prey-specific value is not available. The value shown is the small mammal BAF for this chemical.
[h] Value from Baes et al. (1984) for leafy portions of plants multiplied by 0.2 to represent 80% water composition of plants.
[i] Value derived from BTFs, presented in Baes et al. (1984) for uptake into cattle. BTF converted to BAF by multiplying by food ingestion rate of 12 kg/day dry weight.
[j] BCF for earthworms from Diercxsens, et.al. (1985).

Table continued on next page.

Table G-1
Summary of Bioaccumulation Data

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

References:

Baes, C.F. III, R.D. Sharp, A.L. Sjoreen, and R.W. Shor. 1984. "A Review and Analysis of Parameters for Assessing Transport of Environmentally Released Radionuclides through Agriculture." ORNL-5786. U.S. Department of Energy, Environmental Sciences Division Oak Ridge, Tennessee: Oak Ridge National Laboratory (September).

Beyer, W.N. 1990. "Evaluating Soil Contamination." Biological Report No. 90(2). U.S. Department of the Interior, Fish and Wildlife Service. Washington, D.C.

Maughan, J.T. 1993. Ecological Assessment of Hazardous Waste Sites. New York: Van Nostrand Reinhold.

Suter, G. W. 1993. "Ecological Risk Assessment." Chelsea Michigan: Lewis Publishers.

Travis, C.C., and A.D. Arms. 1988. "Bioconcentration of Organics in Beef, Milk, and Vegetation." Environ. Sci. Tech. 22:271-274.

U.S. Environmental Protection Agency (USEPA). 1993. Superfund Chemical Data Matrix (SCDM). Washington, D.C.

Notes: Log K_{ow} = Logarithm transformation of the octanol/water partitioning coefficient.
BAF = bioaccumulation factor.
mg/kg = milligrams per kilogram.
BTF = biotransfer factor.

Table G-2
Ingestion Toxicity Information for Wildlife

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Test Species	Test Type	Duration	Effect	Lethal RTV mg/kg-BW-day			Sublethal RTV mg/kg-BW-day			References
					Oral LD50	LOAEL	RTV[1]	LOAEL	NOAEL	RTV[2]	
Volatile Organic Compounds											
Methylene chloride	Rat	Oral LD50	NR	Mortality	1,600		320				RTECS, 1994
	Dog	Oral LD50	NR	Mortality	3,000		600				RTECS, 1994
	Rabbit	Oral LD50	NR	Mortality	1,900						RTECS, 1994
	Rat	Oral (chronic)	2 years	Liver toxicity				52.6	5.9		IRIS, 1993
	Rat	Oral (subchronic)	3 months	Mortality, blood chemistry, histopathology-12.5							
Semivolatile Organic Compounds											
bis(2-Ethylhexyl)phthalate	Rat	Oral LD50	NR	Mortality	30,600						RTECS, 1993
	Rat	Oral	NR	Reproductive effects				7,140			RTECS, 1993
	Rat	Oral	NR	Reproductive effects				35		3.5	RTECS, 1993
	Rat	Oral	NR	Reproductive effects				6,000			RTECS, 1993
	Rat	Oral	NR	Reproductive effects				17,200			RTECS, 1993
	Rat	Oral	NR	Reproductive effects				10,000			RTECS, 1993
	Rat	Oral	NR	Reproductive effects				9,766			RTECS, 1993
	Mouse	Oral LD50	NR	Mortality	30,000						RTECS, 1993
	Mouse	Oral	NR	Reproductive effects				78,880			RTECS, 1993

See notes at end of table.

Table G-2 (Continued)
Ingestion Toxicity Information for Wildlife

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Test Species	Test Type	Duration	Effect	Lethal RTV mg/kg-BW-day			Sublethal RTV mg/kg-BW-day			References
					Oral LD50	LOAEL	RTV[1]	LOAEL	NOAEL	RTV[2]	
Semivolatile Organic Compounds (Continued)											
	Mouse	Oral	NR	Reproductive effects				4,200			RTECS, 1993
	Mouse	Oral	NR	Reproductive effects				50			RTECS, 1993
	Mouse	Oral	NR	Reproductive effects				1,000			RTECS, 1993
	Mouse	Oral	NR	Reproductive effects				2,040			RTECS, 1993
	Rabbit	Oral LD50	NR	Mortality	34,000						RTECS, 1993
	Guinea pig	Oral LD50	NR	Mortality	26,000						RTECS, 1993
	Guinea pig	Oral	NR	Reproductive effects				20,000			RTECS, 1993
	Mammal	Oral	NR	Reproductive effects				20,000			RTECS, 1993
	Mammal	Oral	NR	Reproductive effects				509,000			RTECS, 1993
	Mouse	Oral LD50		Mortality	800		160				RTECS, 1993
	Mouse	Oral (subchronic)	13 weeks	Renal effects				125			RTECS, 1993
Inorganic Analytes											
Aluminum	Mouse	Oral (chronic)	2-3 generations	Reduced body weight gain of newborns				[3]425		1,425	NIOSH, 1985

See notes at end of table.

Table G-2 (Continued)
Ingestion Toxicity Information for Wildlife

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Test Species	Test Type	Duration	Effect	Lethal RTV mg/kg-BW-day			Sublethal RTV mg/kg-BW-day			References
					Oral LD50	LOAEL	RTV[1]	LOAEL	NOAEL	RTV[2]	
Inorganic Analytes (Continued)											
	Rat	Oral (subchronic)	15 days	Reduced growth				100			Bernuzzi, V., et al., 1989
	Rat	Oral LD50	NR	Mortality	3,700		740				Sax, N.I, 1984
Manganese	Mouse	Oral (subchronic)	90 days	Delayed growth of testes				140		14	ATSDR, 1990a
	Mouse	Oral (chronic)	1 0 3 weeks	Mortality	4,050						ATSDR, 1990a
	Rat	Oral LD50	NR	Mortality	410						ATSDR, 1990a
	Rat	Oral LD50	20 days	Mortality	225		45				ATSDR, 1990a
	Rat	Oral (subchronic)	20 days	Decreased litter weight during gestation					620		ATSDR, 1990a
	Rat	Oral (chronic)	1 0 3 weeks	Mortality	930						ATSDR, 1990a
	Guinea pig	Oral LD50	NR	Mortality	400						USEPA, 1984a
	Monkey	Oral (chronic)	1 8 months	Weakness, rigidity				25			ATSDR, 1990a
	Rodents/ livestock	Oral (subchronic)	10 days - 2 months	Decreased growth rate				100			Cunningham, et al., 1966
	Mouse	Oral (subchronic)	180 days	Mortality		2,300					Glanutsos, G., et al., 1982
Chromium	Japanese quail	Oral LD-d50	5 days	Mortality	126		25				Hill and Camardese, 1986
	Rat	Oral (subchronic)	90 days	Histopathologic and reproductive effects					1,400		Ivankovic and Preussman, 1975
	Mouse	Oral (chronic)	7 weeks	Decreased spermatogenesis				3.5		0.35	ATSDR, 1993b
	Black Duck	Oral (subchronic)	5 months	Reproductive effects					200	200	Outridge and Scheuhammer, 1993
	Rat	Oral LD-d50		Mortality	200		40				ATSDR, 1991e

See notes at end of table.

Table G-2 (Continued)
Ingestion Toxicity Information for Wildlife

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Test Species	Test Type	Duration	Effect	Lethal RTV mg/kg-BW-day			Sublethal RTV mg/kg-BW-day			References
					Oral LD50	LOAEL	RTV[1]	LOAEL	NOAEL	RTV[2]	
Vanadium	Japanese quail	Oral LD50	5 days	Mortality	96		19.2				Hill, E.F., et al., 1986
	Mouse	Gavage LD50	One time	Mortality	31		6.2				ATSDR, 1990c
	Rat	Oral (subchronic)	2 months	Hypertension				15			Susic, D., et al., 1986
	Rat	Oral (subchronic)	35 days	Development effects					8.4	8.4	Domingo, J.L., et al., 1986
	Chicken	Oral (subchronic)	6 weeks	Decrease in egglaying				[4]11		1.1	Berg, L.R., et al., 1963

[1] Selected lethal RTVs are boxed. The lethal RTVs correspond to the NOAEL when available. When an NOAEL is not available, then the RTV value is calculated by applying a ten-fold application factor to the LOAEL or a five-fold application factor to the Oral LD50.
[2] Selected sublethal RTVs are boxed. The sublethal RTV corresponds to the NOAEL when available. When an NOAEL is not available, the sublethal RTV value is calculated by applying a ten-fold application factor to the sublethal LOAEL.
[3] Sublethal RTV for aluminum is equal to the LOAEL value because the toxicity test is multi-generational in duration.
[4] Converted from 30 ppm to 11 mg/kg BW-day using standard default parameters (USEPA, 1988).

References:

ATSDR, 1990a, "Toxicological Profile for Manganese," Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, October.
ATSDR, 1990b, "Toxicological Profile for Silver," Agency for Toxic Substances and Disease Registry, U.S. Public Health Service.
ATSDR, 1990c, "Toxicological Profile for Vanadium," Agency for Toxic Substances and Disease Registry, U.S. Public Health Service.
Berg, L.R., G.E. Bearse, and L.H. Merrill, 1963, "Vanadium Toxicity in Laying Hens," Poultry Science, Vol. 42, pp. 1407-1411.
Bernuzzi, V., D. Desor, and P.R. Lehr, 1989, "Effects of Postnatal Aluminum Lactate Exposure on Neuromotor Maturation in Rats," Bulletin of Environmental Contamination and Toxicology, Vol. 42, pp. 451-5.
Cunningham, G.N., M.B. Wise, and E.R. Barrick, 1966, "Effect of High Dietary Levels of Manganese on the Performance and Blood Constituents of Calves," Journal of Animal Science, Vol. 25, p. 532.
Domingo, J.L., J.L. Paternain, J.M. Llobet, and J. Corbella, 1986, "Effects of Vanadium on Reproduction, Gestation, Parturition, and Lactation in Rats Upon Oral Administration," Life Sciences, Vol. 39, pp. 819-824.

Table G-2 (Continued)
Ingestion Toxicity Information for Wildlife

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

References: (Continued)

Dunning, J.B., 1984, Body Weights of 686 Species of North American Birds, Monograph No. 1, Cave Creek, Arizona: Western Bird Banding Association, May.

Gianutsos, G., and M.T. Murray, 1982, "Alterations in Brain Dopamine and GABA following Inorganic or Organic Manganese Administration," Neurotoxicology, Vol. 3, pp. 75-81, 1982.

Hill, E.F., and M.B. Camardese, 1986, "Lethal Dietary Toxicities of Environmental Contaminants and Pesticides to Coturnix," Technical Report No. 2, U.S. Fish and Wildlife Service, Washington, D.C.

Integrated Risk Information System (IRIS), 1988-1993, "Volumes I and II. Chemical Files," U.S. Environmental Protection Agency, Washington, D.C.

National Institute for Occupational Safety and Health (NIOSH), 1985, "Registry of Toxic Effects of Chemical Substances," NIOSH Publication No. 86-103, U.S. Department of Health and Human Services, Washington, D.C.

Registry of Toxic Effects of Chemical Substances (RTECS), 1993-1995, On-line database search.

Sax, N.I., 1984, Dangerous Properties of Industrial Material, 6th edition, New York: Van Nostrand Reinhold Company.

Susic, D., and D. Kentera, 1986, "Effect of Chronic Vanadate Administration on Pulmonary Circulation in the Rat," Respiration, Vol. 49, pp. 68-72.

USEPA, 1984a, "Health Effects Assessment for Chloride," Environmental Criteria and Assessment Office, Cincinnati, Ohio, September.

USEPA, 1984b, "Health Effects Assessment for Benzene," Office of Emergency and Remedial Response, Washington, D.C., September.

USEPA, 1988, "Recommendations for and Documentation of Biological Values for use in Risk Assessment" PB 88-179874, EPA-600/6-87-008, Washington, D.C.

Notes: mg/kg = milligrams per kilogram.
RTV = reference toxicity value.
BW = body weight.
LD_{50} = dose resulting in 50% mortality in test population.
LOAEL = lowest observed adverse effect level.
NOAEL = no observed adverse effect level.
NR = not reported.
% = percent.
gest = gestation.

Table G-3
RTVs Selected for Ecological Risk Assessment [a]

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Small Mammal [b]		Small Bird [c]		Predatory Mammal [d]		Predatory Bird [e]	
	Lethal	Sublethal	Lethal	Sublethal	Lethal	Sublethal	Lethal	Sublethal
Volatile Organic Compounds								
Methylene chloride	320	NA	NA	NA	600	NA	NA	NA
Semivolatile Organic Compounds								
bis(2-Ethylhexyl)phthalate	160	3.5	NA	NA	160	3.5	NA	NA
Inorganic Analytes								
Aluminum	740	425	NA	NA	740	425	NA	NA
Chromium	40	0.35	25	200	40	0.35	25	200
Manganese	45	14	NA	NA	45	14	NA	NA
Vanadium	6.2	8.4	19.2	1.1	6.2	8.4	19.2	1.1

[a] Lethal RTVs correspond to the boxed lethal RTV presented in Table G-2. Lethal RTVs correspond to the highest NOAEL, one-tenth of the lowest LOAEL, or one-fifth of the lowest LD_{50}. Sublethal RTVs correspond to the boxed RTV. When an NOAEL value is not available, one-tenth of the sublethal LOAEL is used as a surrogate.
[b] These RTVs represent chemical concentration that are not anticipated to result in adverse effects for the cotton mouse and short-tailed shrew.
[c] These RTVs represent chemical concentrations that are not anticipated to result in adverse effects for the eastern meadowlark.
[d] These RTVs represent chemical concentrations that are not anticipated to result in adverse effects for the red fox. When no data were available, the small mammal value is used as a surrogate.
[e] These RTVs represent chemical concentrations that are not anticipated to result in adverse effects for the great-horned owl. When no data were available, the small bird value is used as a surrogate.

Notes: NA = not available.
RTV = reference toxicity value.
mg/kg = milligrams per kilogram.
LD_{50} = dose resulting in 50% mortality in test population.
LOAEL = lowest observed adverse effect level.
NOAEL = no observed adverse effect level.

Table G-4
Summary of Toxicity Data for Plant Receptors

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Reference	RTV in soil [a] (mg/kg)	RTV in solution (mg/ℓ) [a]
Volatile Organic Compounds			
Methylene chloride		>1,000	
Semivolatile Organic Compounds			
bis(2-Ethylhexyl)phthalate	Hulzebos et al., 1993 [c]	>1,000	$>S_w$
Inorganic Analytes			
Aluminum	Will and Suter, 1994	50	0.2
Chromium	Will and Suter, 1994	1	0.05
Manganese	Will and Suter, 1994	500	4
Vanadium	Will and Suter, 1994	2	0.5

[a] RTVs in soil are equal to chemical concentrations in soil that are not expected to result in adverse effects to plants.
[b] Value for toluene used as a surrogate (Will and Suter, 1994).
[c] Value represents 14-day growth EC_{50} for *Lactuca sativa* in soil.

Notes: RTV = reference toxicity value.
mg/kg = milligrams per kilogram.
> = greater than.

References:

Hulzebos, E.M., D.M.M. Adema, E.M. Dirven-van Breemen, L. Henzen, W.A. van Dis, H.A. Herbold, J.A. Hoekstra, R. Baerselman, and C.A.M. van Gestel. 1993. "Phytoxicity Studies with Lactuca sativa in Soil and Nutrient Solution." Environ. Toxicol. and Chem. 1

Will, M.E., and G.W. Suter. 1994. Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Terrestrial Plants. 1994 Rev. (September). Environmental Sciences Division. Oak Ridge, Tennessee: Oak Ridge National Laboratory.

Table G-5
Summary of Toxicity Data for Terrestrial Invertebrates

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Test Type	Test Duration	Test Species	Chemical concentration (mg/kg)	Effect	RTV (mg/kg)	Reference
Volatile Organic Compounds							
Methylene chloride	Soil Test	14-day	*E. foetida*	740	LC_{50}	150	Neuhauser et al., 1985.
Semivolatile Organic Compounds							
bis(2-Ethylhexyl)phthalate	Soil Test	14-day	4 test species	2,390	LC_{50}	478	Neuhauser et al., 1985.
Inorganic Analytes							
Aluminum	NA	NA	NA	NA	NA	NA	NA
Chromium	Soil Test	8-week	*E. foetida*	250	Reproduction inhibitor	50	Molnar et al., 1989
Manganese	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA

[a] Equal to the lowest LC_{50} in each chemical class, multiplied by a safety factor of 0.2. Value for 2-chloroethylvinylether used for chlorinated solvents.

[b] Mean of LC_{50} for four test species (*A. teberculata, E. foetida, E. eugeniae*, and *P. excavatus*) from artificial soil tests; values used for a whole chemical class are multiplied by a factor of 0.2 (Neuhauser et al., 1986). Value for dimethylphthalate used for phthalates.

Reference:

Neuhauser, E.F., R.C. Loehr, M.R. Malecki, D.L. Milligan, and P.R. Durkin. 1985. "The Toxicity of Selected Organic Chemicals to the Earthworm *Eisenia foetida*." J. Environ. Qual. 14:383-388.

Notes: mg/kg = milligrams per kilogram.
RTV = reference toxicity value.
NA = not available.
LD_{50} = dose resulting in 50 percent mortality in test population.

Table G-6.
Exposure Parameters and Assumptions for Representative Wildlife Species [a]
Remedial Investigation Report, Site 13
Naval Air Station Whiting Field
Milton, Florida

Representative Wildlife Species		Percent Prey in Diet: Inverts	Plants	Small Mammals	Small Birds	Soil	Home Range (acres)	ED [b]	Site Foraging Frequency [c]	Food Ingestion Rate (kg/day)	Body Weight (kg)
Cotton mouse	(Small herb. mammal)	10%	88%	0%	0%	2%	0.147	1	1.00E+00	0.0029	0.021
Eastern meadowlark	(Small omn. bird)	75%	20%	0%	0%	5%	5	1	1.00E+00	0.0119	0.087
Short-tailed shrew	(Small carn. mammal)	78%	12%	0%	0%	10%	0.96	1	1.00E+00	0.0024	0.017
Red fox	(Predatory mammal)	20%	10%	57%	10%	3%	250	1	3.00E-02	0.24	4.69
Great-horned owl	(Predatory bird)	0%	0%	80%	19%	1%	15	1	5.00E-01	0.078	1.5
Mourning Dove	(herb. bird)	1%	94%	0%	0%	5%	5	1	1.00E+00	0.015	0.13

NOTES:

SITE AREA:	7.5 acres

[a] Documentation of exposure parameters presented in: Table 7-5.

[b] ED = Exposure Duration (percentage of year receptor is expected to be found at study area).

[c] SFF = Site Foraging Frequency (calculated by dividing site area by receptor home range (cannot exceed 1.0)).

Table G-7
Estimated Exposure from Ingestion of Food and Soil Containing the Reasonable Maximum Exposure Concentration of ECPCs.
Remedial Investigation Report, Site 13
Naval Air Station Whiting Field
Milton, Florida

EXPOSURE CONCENTRATION DATA		ESTIMATED CONCENTRATIONS IN PRIMARY FOOD ITEMS				BAF VALUES FOR OTHER FOOD ITEMS	
ANALYTE	RME CONCENTRATION (mg/kg)	Invert BAF [a]	Concentration in Invertebrate Tissue [b] (mg/kg)	Plant BAF [a]	Concentration in Plant Tissue [c] (mg/kg)	Small Mammal BAF [a]	Small Bird BAF [a]
Methylene chloride	0.0071	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	0.26	5.0E-02	1.3E-02	8.7E-03	2.3E-03	1.9E-01	NA
Aluminum	22026	7.5E-02	1.7E+03	8.0E-04	1.8E+01	7.5E-02	NA
Manganese	219	2.0E-02	4.4E+00	5.0E-02	1.1E+01	2.0E-02	NA
~~Silver~~	~~1.1~~	~~1.5E-01~~	~~1.7E-01~~	~~8.0E-02~~	~~8.8E-02~~	~~1.5E-01~~	~~NA~~
Vanadium	43.8	1.2E-01	5.3E+00	1.1E-03	4.8E-02	1.2E-01	NA
Chromium	24.2	1.6E-01	4.5E+00	1.5E-03	4.2E-02	2.8E-01	NA

ECPC = Ecological Chemical of Potential Concern.
RME = Reasonable Maximum Exposure.
BAF = Bioaccumulation Factor.
mg/kg = milligrams per kilograms

[a] Bioaccumulation data presented in: Table G-1.
[b] Invertebrate tissue concentration is the invertebrate BAF multiplied by the RME concentration.
[c] Plant tissue concentration is the plant BAF multiplied by the RME concentration.

Table G-7
Estimated Exposure from Ingestion of Food and Soil Containing the Reasonable Maximum Exposure Concentration of ECPCs.
Remedial Investigation Report, Site 13
Naval Air Station Whiting Field
Milton, Florida

POTENTIAL DIETARY EXPOSURE (mg/kgBW/day) [d]

ANALYTE	Cotton mouse	Eastern meadowlark	Short-tailed shrew	Red fox	Great-horned owl	Mourning Dove
Methylene chloride	2.0E-05	4.9E-05	1.0E-04	3.3E-07	1.8E-06	7.7E-04
bis(2-Ethylhexyl)phthalate	1.2E-03	3.2E-03	5.1E-03	2.0E-05	1.6E-04	2.8E-02
Aluminum	8.6E+01	3.2E+02	4.9E+02	1.7E+00	8.9E+00	2.4E+03
Manganese	2.0E+00	2.2E+00	3.6E+00	1.3E-02	6.5E-02	2.4E+04
~~Silver~~	~~1.6E-02~~	~~2.7E-02~~	~~3.4E-02~~	~~1.4E-04~~	~~8.4E-04~~	
Vanadium	2.0E-01	8.4E-01	1.2E+00	4.2E-03	2.4E-02	2.6E+00
Chromium	6.6E-02	1.6E-01	3.4E-01	2.1E-02	1.2E-01	2.6E+00

[d] Calculated by summing the concentration derived from each pathway (multiplying pathway concentration, percent in diet, SFF, and ingestion rate, and then dividing by body weight).

SFF = Site Foraging Frequency.

Table G-8
Lethal Effect Risks for Representative Wildlife Species from RME Concentrations of ECPCs.
Remedial Investigation Report, Site 13
Naval Air Station Whiting Field
Milton, Florida

ANALYTE	Cotton mouse			Eastern meadowlark			Short-tailed shrew		
	PDE	RTV	HQ	PDE	RTV	HQ	PDE	RTV	HQ
Methylene chloride	2.0E-05	3.2E+02	6.1E-08	4.9E-05	NA	NA	1.0E-04	3.2E+02	3.1E-07
bis(2-Ethylhexyl)phthalate	1.2E-03	1.6E+02	7.3E-06	3.2E-03	NA	NA	5.1E-03	1.6E+02	3.2E-05
Aluminum	8.6E+01	7.4E+02	1.2E-01	3.2E+02	NA	NA	4.9E+02	7.4E+02	6.7E-01
Manganese	2.0E+00	4.5E+01	4.4E-02	2.2E+00	NA	NA	3.6E+00	4.5E+01	7.9E-02
~~Silver~~	~~1.6E-02~~	~~6.8E+00~~	~~2.4E-03~~	~~2.7E-02~~	~~NA~~	~~NA~~	~~3.4E-02~~	~~6.8E+00~~	~~5.0E-03~~
Vanadium	2.0E-01	6.2E+00	3.2E-02	8.4E-01	1.9E+01	4.4E-02	1.2E+00	6.2E+00	1.9E-01
Chromium	1.4E-01	4.0E+01	3.6E-03	6.5E-01	2.5E+01	2.6E-02	8.9E-01	4.0E+01	2.2E-02
SUMMARY HAZARD INDEX			1.9E-01			~~4.4E-02~~ 6.0E-02			9.4E-01

PDE = Potential Dietary Exposure (mg/kg-BW/day).

RTV = Reference Toxicity Value (mg/kg-BW/day) = highest NOAEL for closest related species. When an NOAEL is not available, then 1/10 of the lowest reported LOAEL, or 1/5 of the lowest reported LD_{50} is used as a surrogate.

HQ = Hazard Quotient (calculated by dividing PDE by RTV).

NA = not available.

Table G-8
Lethal Effect Risks for Representative Wildlife Species from RME Concentrations of ECPCs.
Remedial Investigation Report, Site 13
Remedial Investigation Report, Site 13
Naval Air Station Whiting Field
Milton, Florida

ANALYTE	Red fox			Great-horned owl		
	PDE	RTV	HQ	PDE	RTV	HQ
Methylene chloride	3.3E-07	6.0E+02	5.4E-10	1.8E-06	NA	NA
bis(2-Ethylhexyl)phthalate	2.0E-05	1.6E+02	1.3E-07	1.6E-04	NA	NA
Aluminum	1.7E+00	7.4E+02	2.2E-03	8.9E+00	NA	NA
Manganese	1.3E-02	4.5E+01	3.0E-04	6.5E-02	NA	NA
~~Silver~~	~~1.4E-04~~	~~6.8E+00~~	~~2.0E-05~~	~~8.4E-04~~	~~NA~~	~~NA~~
Vanadium	4.2E-03	6.2E+00	6.7E-04	2.4E-02	1.9E+01	1.2E-03
Chromium	1.2E-01	4.0E+01	3.0E-03	5.5E-02	2.5E+01	2.2E-03
SUMMARY HAZARD INDEX			3.2E-03			3.4 ~~1.2E-03~~

PDE = Potential Dietary Exposure (mg/kg-BW/day).

RTV = Reference Toxicity Value (mg/kg-BW/day) = highest NOAEL for closest related species. When an NOAEL is not available, then 1/10 of the lowest reported LOAEL, or 1/5 of the lowest reported LD_{50} is used as a surrogate.

HQ = Hazard Quotient (calculated by dividing PDE by RTV).

NA = not available.

BW = body weight.

Table G-9
Sublethal Effect Risks for Representative Wildlife Species from RME Concentrations of ECPCs.
Remedial Investigation Report, Site 13
Naval Air Station Whiting Field
Milton, Florida

ANALYTE	*Cotton mouse*			*Eastern meadowlark*			*Short-tailed shrew*		
	PDE	RTV	HQ	PDE	RTV	HQ	PDE	RTV	HQ
Methylene chloride	2.0E-05	NA	NA	4.9E-05	NA	NA	1.0E-04	NA	NA
bis(2-Ethylhexyl)phthalate	1.2E-03	3.5E+00	3.4E-04	3.2E-03	NA	NA	5.1E-03	3.5E+00	1.5E-03
Aluminum	8.6E+01	4.3E+02	2.0E-01	3.2E+02	NA	NA	4.9E+02	4.3E+02	1.2E+00
Manganese	2.0E+00	1.4E+01	1.4E-01	2.2E+00	NA	NA	3.6E+00	1.4E+01	2.6E-01
~~Silver~~	~~1.6E-02~~	~~NA~~	~~NA~~	~~2.7E-02~~	~~NA~~	~~NA~~	~~3.4E-02~~	~~NA~~	~~NA~~
Vanadium	2.0E-01	8.4E+00	2.4E-02	8.4E-01	1.1E+00	7.6E-01	1.2E+00	8.4E+00	1.4E-01
Chromium	1.4E-01	1.4E+03	1.04E-04	6.8E-01	2.0E+02	3.3E-03	8.9E-01	1.4E+03	6.3E-04
SUMMARY HAZARD INDEX			3.7E-01			7.6E-01			1.6E+00

PDE = Potential Dietary Exposure (mg/kg-BW/day).

RTV = Reference Toxicity Value (mg/kg-BW/day) = highest NOAEL for closest related species. When an NOAEL is not available, then 1/10 of the lowest reported LOAEL is used as a surrogate.

HQ = Hazard Quotient (calculated by dividing PDE by RTV).

NA = not available.

Table G-9
Sublethal Effect Risks for Representative Wildlife Species from RME Concentrations of ECPCs.
Remedial Investigation Report, Site 13
Naval Air Station Whiting Field
Milton, Florida

ANALYTE	Red fox			Great-horned owl		
	PDE	RTV	HQ	PDE	RTV	HQ
Methylene chloride	3.3E-07	NA	NA	1.8E-06	NA	NA
bis(2-Ethylhexyl)phthalate	2.0E-05	3.5E+00	5.7E-06	1.6E-04	NA	NA
Aluminum	1.7E+00	4.3E+02	3.9E-03	8.9E+00	NA	NA
Manganese	1.3E-02	1.4E+01	9.6E-04	6.5E-02	NA	NA
~~Silver~~	~~1.4E-04~~	~~NA~~	~~NA~~	~~8.4E-04~~	~~NA~~	~~NA~~
Vanadium	4.2E-03	8.4E+00	5.0E-04	2.4E-02	1.1E+00	2.2E-02
Chromium	1.2E-01	1.4E+03	8.5E-05	5.5E-02	2.0E+02	
SUMMARY HAZARD INDEX			5.4E-03			2.2E-02

PDE = Potential Dietary Exposure (mg/kg-BW/day).

RTV = Reference Toxicity Value (mg/kg-BW/day) = highest NOAEL for closest related species. When an NOAEL is not available, then 1/10 of the lowest reported LOAEL is used as a surrogate.

HQ = Hazard Quotient (calculated by dividing PDE by RTV).

NA = not available.

BW = body weight.

Table G-10
Estimated Exposure from Ingestion of Food and Soil Containing Central Tendency Concentration of ECPCs: Lethal Effects
Remedial Investigation Report, Site 13
Naval Air Station Whiting Field
Milton, Florida

EXPOSURE CONCENTRATION DATA		ESTIMATED CONCENTRATIONS IN PRIMARY FOOD ITEMS				BAF VALUES FOR OTHER FOOD ITEMS	
ANALYTE	CENTRAL TENDENCY CONCENTRATION (mg/kg)	Invert BAF [a]	Concentration in Invertebrate Tissue [b] (mg/kg)	Plant BAF [a]	Concentration in Plant Tissue [c] (mg/kg)	Small Mammal BAF [a]	Small Bird BAF [a]
Methylene chloride	0.006	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	0.189	5.0E-02	9.5E-03	8.7E-03	1.6E-03	1.9E-01	NA
Aluminum	16042	7.5E-02	1.2E+03	8.0E-04	1.3E+01	7.5E-02	NA
Manganese	95.5	2.0E-02	1.9E+00	5.0E-02	4.8E+00	2.0E-02	NA
~~Silver~~	~~0.85~~	~~1.5E-01~~	~~1.3E-01~~	~~8.0E-02~~	~~6.8E-02~~	~~1.5E-01~~	~~NA~~
Vanadium	30.9	1.2E-01	3.7E+00	1.1E-03	3.4E-02	1.2E-01	NA
Chromium	24.2	1.6E-01	4.5E+00	1.5E-03	4.2E-02	2.8E-01	NA

ECPC = Ecological Chemical of Potential Concern.
BAF = Bioaccumulation Factor.
mg/kg = milligrams per kilograms.

[a] Bioaccumulation data presented in: Table G-1.
[b] Invertebrate tissue concentration is the invertebrate BAF multiplied by the central tendency exposure concentration.
[c] Plant tissue concentration is the plant BAF multiplied by the central tendency exposure concentration.

Table G-10
Estimated Exposure from Ingestion of Food and Soil Containing Central Tendency Concentration of ECPCs: Lethal Effects
Remedial Investigation Report, Site 13
Naval Air Station Whiting Field
Milton, Florida

POTENTIAL DIETARY EXPOSURE (mg/kgBW/day) [d]

ANALYTE	*Cotton mouse*	*Eastern meadowlark*	*Short-tailed shrew*	*Red fox*	*Great horned owl*	mourning Dove
Methylene chloride	1.7E-05	4.1E-05	8.5E-05	2.8E-07	1.6E-06	7.7E-04
bis(2-Ethylhexyl)phthalate	8.5E-04	2.3E-03	3.7E-03	1.5E-05	1.1E-04	2.8E-02
Aluminum	6.2E+01	2.3E+02	3.6E+02	1.2E+00	6.5E+00	2.4E+03
Manganese	8.7E-01	9.8E-01	1.6E+00	5.9E-03	2.8E-02	2.4E+04
~~Silver~~	~~1.2E-02~~	~~2.1E-02~~	~~2.6E-02~~	~~1.1E-04~~	~~6.5E-04~~	
Vanadium	1.4E-01	5.9E-01	8.4E-01	2.9E-03	1.7E-02	4.0E+00
chromium	6.6E-02	1.6E-01	3.4E-01	2.1E-02	1.2E-01	2.6E+00

[d] Calculated by summing the concentration derived from each pathway (multiplying pathway concentration, percent in diet, SFF, and ingestion rate, and then dividing by body weight).

SFF = Site Foraging Frequency.

Table G-11
Lethal Effect Risks for Representative Wildlife Species from Central Tendency Concentrations of ECPCs.
Remedial Investigation Report, Site 13
Naval Air Station Whiting Field
Milton, Florida

ANALYTE	*Cotton mouse*			*Eastern meadowlark*			*Short-tailed shrew*		
	PDE	RTV	HQ	PDE	RTV	HQ	PDE	RTV	HQ
Methylene chloride	1.7E-05	3.2E+02	5.2E-08	4.1E-05	NA	NA	8.5E-05	3.2E+02	2.6E-07
bis(2-Ethylhexyl)phthalate	8.5E-04	1.6E+02	5.3E-06	2.3E-03	NA	NA	3.7E-03	1.6E+02	2.3E-05
Aluminum	6.2E+01	7.4E+02	8.4E-02	2.3E+02	NA	NA	3.6E+02	7.4E+02	4.9E-01
Manganese	8.7E-01	4.5E+01	1.9E-02	9.8E-01	NA	NA	1.6E+00	4.5E+01	3.5E-02
~~Silver~~	~~1.2E-02~~	~~6.8E+00~~	~~1.8E-03~~	~~2.1E-02~~	~~NA~~	~~NA~~	~~2.6E-02~~	~~6.8E+00~~	~~3.8E-03~~
Vanadium	1.4E-01	6.2E+00	2.3E-02	5.9E-01	1.9E+01	3.1E-02	8.4E-01	6.2E+00	1.4E-01
Chromium	1.4E-01	4.0E+01	3.6E-03	6.5E-01	2.5E-01	2.6E-02	8.9E-01	~~1.4E+03~~ 4.0E+01	~~6.3E-04~~ 2.2E-02
SUMMARY HAZARD INDEX			1.3E-01			3.1E-02			6.6E-01

PDE = Potential Dietary Exposure (mg/kg-BW/day).

RTV = Reference Toxicity Value (mg/kg BW/day) = highest NOAEL for closest related species. When an NOAEL is not available, then 1/10 of the lowest reported LOAEL, or 1/5 of the lowest reported LD_{50} is used as a surrogate.

HQ = Hazard Quotient (calculated by dividing PDE by RTV).

NA = not available.

Table G-11
Lethal Effect Risks for Representative Wildlife Species from Central Tendency Concentrations of ECPCs.
Remedial Investigation Report, Site 13
Naval Air Station Whiting Field
Milton, Florida

ANALYTE	*Red fox*			*Great-horned owl*		
	PDE	RTV	HQ	PDE	RTV	HQ
Methylene chloride	2.8E-07	6.0E+02	4.6E-10	1.6E-06	NA	NA
bis(2-Ethylhexyl)phthalate	1.5E-05	1.6E+02	9.1E-08	1.1E-04	NA	NA
Aluminum	1.2E+00	7.4E+02	1.6E-03	6.5E+00	NA	NA
Manganese	5.9E-03	4.5E+01	1.3E-04	2.8E-02	NA	NA
~~Silver~~	~~1.1E-04~~	~~6.8E+00~~	~~1.6E-05~~	~~6.5E-04~~	~~NA~~	~~NA~~
Vanadium	2.9E-03	6.2E+00	4.7E-04	1.7E-02	1.9E+01	8.7E-04
Chromium	1.2E-01	9.0E+01	8.0E-03	5.5E-02	2.6E+01	2.2E-03
SUMMARY HAZARD INDEX			2.3E-03			8.7E-04

PDE = Potential Dietary Exposure (mg/kg-BW/day).

RTV = Reference Toxicity Value (mg/kg-BW/day) = highest NOAEL for closest related species. When an NOAEL is not available, then 1/10 of the lowest reported LOAEL, or 1/5 of the lowest reported LD_{50} is used as a surrogate.

HQ = Hazard Quotient (calculated by dividing PDE by RTV).

NA = not available.

BW = body weight.

Table G-12
Sublethal Effect Risks for Representative Wildlife Species from Central Tendency Exposure Concentrations of ECPCs.
Remedial Investigation Report, Site 13
Naval Air Station Whiting Field
Milton, Florida

ANALYTE	*Cotton mouse*			*Eastern meadowlark*			*Short-tailed shrew*		
	PDE	RTV	HQ	PDE	RTV	HQ	PDE	RTV	HQ
Methylene chloride	1.7E-05	NA	NA	4.1E-05	NA	NA	8.5E-05	NA	NA
bis(2-Ethylhexyl)phthalate	8.5E-04	3.5E+00	2.4E-04	2.3E-03	NA	NA	3.7E-03	3.5E+00	1.1E-03
Aluminum	6.2E+01	4.3E+02	1.5E-01	2.3E+02	NA	NA	3.6E+02	4.3E+02	8.4E-01
Manganese	8.7E-01	1.4E+01	6.2E-02	9.8E-01	NA	NA	1.6E+00	1.4E+01	1.1E-01
~~Silver~~	~~1.2E-02~~	~~NA~~	~~NA~~	~~2.1E-02~~	~~NA~~	~~NA~~	~~2.6E-02~~	~~NA~~	~~NA~~
Vanadium	1.4E-01	8.4E+00	1.7E-02	5.9E-01	1.1E+00	5.4E-01	8.4E-01	8.4E+00	1.0E-01
chromium	1.4E-01	1.4E+03	1.0E-04	6.5E-01	2.0E+02	3.3E-03	8.9E-01	1.4E+03	6.3E-04
SUMMARY HAZARD INDEX			2.3E-01			5.4E-01			1.1E+00

PDE = Potential Dietary Exposure (mg/kg-BW/day).

RTV = Reference Toxicity Value (mg/kg-BW/day) = highest NOAEL for closest related species. When an NOAEL is not available, then 1/10 of the lowest reported LOAEL is used as a surrogate.

HQ = Hazard Quotient (calculated by dividing PDE by RTV).

NA = not available.

Table G-12
Sublethal Effect Risks for Representative Wildlife Species from Central Tendency Exposure Concentrations of ECPCs.
Remedial Investigation Report, Site 13
Naval Air Station Whiting Field
Milton, Florida

ANALYTE	Red fox			Great-horned owl		
	PDE	RTV	HQ	PDE	RTV	HQ
Methylene chloride	2.8E-07	NA	NA	1.6E-06	NA	NA
bis(2-Ethylhexyl)phthalate	1.5E-05	3.5E+00	4.2E-06	1.1E-04	NA	NA
Aluminum	1.2E+00	4.3E+02	2.8E-03	6.5E+00	NA	NA
Manganese	5.9E-03	1.4E+01	4.2E-04	2.8E-02	NA	NA
~~Silver~~	~~1.1E-04~~	~~NA~~	~~NA~~	~~6.5E-04~~	~~NA~~	~~NA~~
Vanadium	2.9E-03	8.4E+00	3.5E-04	1.7E-02	1.1E+00	1.5E-02
Chromium	1.2E-01	1.4E+03	8.5E-05	5.5E-02	2.0E+02	2.7E-04
SUMMARY HAZARD INDEX			3.6E-03			1.5E-02

PDE = Potential Dietary Exposure (mg/kg-BW/day).

RTV = Reference Toxicity Value (mg/kg-BW/day) = highest NOAEL for closest related species. When an NOAEL is not available, then 1/10 of the lowest reported LOAEL is used as a surrogate.

HQ = Hazard Quotient (calculated by dividing PDE by RTV).

NA = not available.

BW = body weight.

Evaluation of the USEPA Process Document with Respect to the Ecological Risk Assessment

The only major difference between the approach used in the Site 13 ERA and the approach recommended in the Process Document (USEPA, 1997), is the order in which information was presented. All of the information that should be included in a screening-level problem formulation (i.e., Step 1 in the process document) was included in this ERA. The difference that would possibly have the greatest effect is that in the ERA, assessment and measurement endpoints were identified before ecological contaminants of potential concern (ECPCs) were selected, whereas the Process Document suggests that more relevant endpoints can be identified if CPCs are selected first. In order to evaluate whether this difference would have any effect on the conclusions of the ERA toxicological data were reviewed, to determine if the selected assessment and measurement endpoints are appropriate for the ECPCs.

The ECPCs identified at Site 13 included methylene chloride, bis(2-ethylhexyl)phthalate, aluminum, chromium, manganese, and vanadium. Ecological effects associated with each of the ECPCs was reviewed and is summarized in the following paragraphs.

Methylene chloride is a volatile organic compound. Ecotoxicological effects associated with this compound include mortality (i.e., lethal effects) for the rat, dog, rabbit, and liver toxicity and histopathology (i.e., sublethal effects) for the rat. It is not expected to build up in plants or animals, and does not readily dissolve in water. Methylene chloride is highly volatile (i.e., evaporates easily), therefore the greatest potential for exposure is breathing vapors in air. Lethal concentrations in air that caused mortality in rats, mice guinea pigs, rabbits, dogs, and primates ranged from 1,000 to 16,000 ppm (ATSDR, 1998). Chronic oral exposure to methylene chloride resulted in varying effects based on dose. Rats exposed orally to 55 mg/kg/day, over a 78 to 104 week exposure period showed changes in fat, decreased body weight, and decreased food and water consumption. Additional studies showed that exposure to methylene chloride caused histological alterations to the liver at a dose of 50 mg/kg/day for 2 years, with a NOAEL of 5 mg/kg/day (IRIS, 1988). Methylene chloride is considered a possible carcinogen, based on tumor growth in some animals exposed to this analyte.

Bis(2-Ethylhexyl)phthalate is a semi-volatile organic compound. Ecotoxicological effects associated with oral exposure to this compound include mortality (at very high doses (30,600 to 33,900 mg/kg, in rats and rabbits), hepatic effects, body weight effects, and developmental and reproductive effects. Rats and mice exposed to BEHP show signs of liver toxicity including enlargement of liver. Chronic exposure to 50 mg/kg/day had an effect on the male test population while the female test population showed signs of liver toxicity at much higher concentrations (i.e., 200 mg/kg/day). Small mammals showed a decrease in weight gain after acute exposure to BEHP (i.e., greater than 1,000 mg/kg/day). There was no effect on weight gain at exposures of 50 and 65 mg/kg/day. A single oral dose of 1,055 mg/kg given to pregnant rats resulted in fetus resorption and fetal mortality. Mice were shown to be more susceptible to reproductive effects as compared to rats. A significant increase in fetal malformations was noted at doses of 91 mg/kg, given during gestation. Reproductive effects are also noted in male rodents exposed to doses as low as 130 mg/kg for 166 days, and at a dose of 390 mg/kg sired significantly fewer offspring. No reproductive effects were

observed in larger mammals (i.e., male monkeys) exposed to 2,000 mg/kg for 14 days. BEHP is not a bioaccumulating compound, and is readily metabolized by mammals.

Aluminum, chromium, manganese, and vanadium are the four inorganic analytes selected as ECPCs at Site 13. Aluminum is excreted, and does not typically bioaccumulate in mammals. Rats exposed to 155 mg/kg/day and 14 mg/kg/day, had significant mortality and decreased fetal weights, respectively. The literature suggest that larger mammals (i.e., dogs) are more susceptible to aluminum toxicity, as the NOAEL for rats is 1,500 mg/kg/day, and the NOAEL for dogs is 60 mg/kg/day (based on affects to the respiratory, cardiac, hepatic, and renal systems). Similarly, the NOAEL based on reproductive effects for small mammals was 100 mg/kg/day, and the NOAEL for dogs was 60 mg/kg/day (ATSDR, 1991). These studies suggest that larger mammals are most susceptible to aluminum toxicity.

Chromium is typically found in trivalent and hexavalent forms, chromium (III) and chromium (VI), respectively. The literature suggests that chromium (VI) is more toxic than chromium (III), and chromium is more toxic to females than males, based on LD50 studies using rats. Chromium is also known to cause reproductive effects in avian and mammalian species (i.e., ducks and rats) (ATSDR, 1998). The oral LD_{50} values for the Japanese quail and rat are 126 and 200 mg/kg/day, respectively. Sublethal effects (i.e., reproductive effects) were noted at concentrations ranging from 1,400 mg/kg/day to 3.5 mg/kg/day.

Manganese is typically found in the environment in combination with oxygen, sulfur, and chloride, forming stable compounds. The literature suggests that manganese has a low acute oral toxicity, based on an LD_{50} value of 1,300 mg/kg/day (14-day exposure period). Long term chronic exposure to manganese, suggest that prolonged exposure (i.e., 2 years) at 200 mg/kg/day to 731 mg/kg/day would likely cause liver toxicity and renal failure. Manganese has a low bioaccumulation potential, and is currently not considered carcinogenic (ATSDR, 1997).

Vanadium also has a low bioaccumulation potential, as it is typically excreted after ingestion; and is currently not considered carcinogenic. The oral LD_{50} for rats, from exposure to vanadium is a single oral dose of 41 mg/kg/day, and the LD_{50} for mice was 31 mg/kg/day. Another LD_{50} was developed for rats based on the exposure of 225 mg/kg/day for 20 days. Developmental effects associated with exposure of pregnant rat dams to vanadium included reduced pup weight and length at birth and throughout lactation (ATSDR, 1990). The toxicological information available for vanadium suggests that pregnant small mammals are more susceptible than other receptors to exposure to vanadium.

The available toxicological data suggest that small mammals may be more susceptible to some of the selected ECPCs whereas large mammals may be more sensitive to others. Toxicological effects for all ECPCs were related reproductive effects or liver/renal effects. If these ECPCs had shown a tendency to target a specific organ or effect, it may have been appropriate to focus endpoints on those effects. Because these ECPCs do not seem to target one type of receptor or effect over another, the assessment endpoints would not change. In addition, because none of these ECPCs shows significant bioaccumulation potential, it may not have been necessary to evaluate food chain effects; an evaluation of incremental soil ingestion alone may have been adequate.

Based on this evaluation, it is apparent that had the Process Document been followed, results and conclusions of the ERA would not differ from those currently presented.

Subsurface Soil Evaluation. A number of volatile and semivolatile organic compounds, and inorganic compounds were detected in subsurface soil at Site 13 (see Table 1). A total of seven VOCs were detected including acetone, carbon disulfide, 2-butanone, 4-methyl-2-pentanone, 2-hexanone, toluene, and xylene were detected in subsurface soil. Two compounds, toluene and xylene were detected at concentrations below ecological screening values. The remaining VOCs lacked ecological screening values, and invertebrate and plant reference toxicity values. Therefore the risks to plants and invertebrates from these analytes could not be quantitatively evaluated. However, it is unlikely that these contaminants would pose a threat to ecological receptors at the levels detected.

A total of five SVOCs were detected in subsurface soil including phenol, 4-methylphenol, naphthalene, diethylphthalate, and bis(2-ethylhexyl)phthalate. Diethylphthalate was detected at a concentration below the available screening value. The remaining compounds were lacking ecological screening values or were detected at concentrations that exceeded available screening values. Bis(2-ethylhexyl)phthalate was detected in one sample at 410 μg/kg, which is less than the invertebrate reference toxicity value. Risks to invertebrates could not be evaluated for the other compounds, as reference toxicity values were unavailable for these compounds. Risks to plants could not be quantitatively evaluated for any of the SVOCs detected in subsurface soil, as reference toxicity values are not available.

A total of twenty one inorganic analytes were detected in subsurface soil. Of these aluminum, chromium, mercury, and vanadium were detected at concentrations that exceeded ecological screening values. Invertebrate reference toxicity values (RTVs) were available for chromium and mercury only, and detected concentrations of these analytes were less than available RTVs. Therefore it is unlikely that invertebrates would be at risk from exposure to these analytes. Risks to invertebrates from exposure to aluminum and vanadium could not be quantitatively evaluated. Plant reference toxicity values were available for all of the inorganic analytes detected above ecological screening values. All of the analytes detected in subsurface were detected at concentrations that exceeded plant RTVs. However, aluminum, chromium, and vanadium were detected at concentrations that are consistent with average concentrations detected in surface soil in the eastern United States (U.S. Geological Survey, 1984). It is important to note that the vegetation observed at the site is consistent with recolonization of a disturbed area, and do not show signs of stress, therefore it is unlikely that these contaminants would pose a risk to plants. Based on this it is unlikely the assessment endpoint including plant biomass and/or plant cover availability would be reduced such that small mammal and bird populations would be affected at Site 13.

Table 1
Comparison of Analytes Detected in Subsurface Soil Samples from Test Pits at Site 13 to Ecological Screening Criteria

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	13SS0201	13SS0302	13SS0503	13SS0503A Duplicate Sample	Invertebrate RTV[1]	Plant RTV[1]		Ecological Screening Value[2]
						Soil	Solution	
Laboratory Sample No:	22927002	22927003	22927005	22927006				
Collection Date:	06-OCT-92	06-OCT-92	06-OCT-92	06-OCT-92				
Sample Depth (ft bls):	5 to 6	8 to 10	8 to 9	8 to 9				
Volatile Organic Compounds (µg/kg)								
Acetone	86 J	67 J	700 J	580 J	NA	NA	NA	NA
Carbon disulfide	--	2 J	--	--	NA	NA	NA	NA
2-Butanone	--	--	270	270	NA	NA	NA	NA
4-Methyl-2-pentanone	--	--	27 J	34	NA	NA	NA	NA
2-Hexanone	--	3 J	--	19 J	NA	NA	NA	NA
Toluene	--	--	--	10 J	NA	NA	NA	50
Xylenes (total)	2 J	2 J	--	12 J	NA	NA	NA	50
Semivolatile Organic Compounds (µg/kg)								
Phenol	--	--	130 J	130 J	NA	70	NA	50
4-Methylphenol	--	68 J	1,200	990	NA	NA	NA	NA
Naphthalene	--	--	510	140 J	NA	NA	NA	100
Diethylphthalate	--	--	140 J	99 J	NA	NA	NA	100,000
bis(2-Ethylhexyl)phthalate	--	--	410 J	--	478	NA	NA	NA
Pesticides and PCBs (µg/kg)								
None Detected								
Inorganic Analytes (mg/kg)								
Aluminum	23,900	10,700	14,800	11,500	NA	50	0.2	50
Antimony	--	--	3.7 J	--	NA	NA	NA	3.5
Beryllium	0.2 J	0.16 J	0.17 J	0.16 J	NA	NA	NA	1.1
Arsenic	6.5	4.7	4.1	3.4	NA	NA	NA	10

See notes at end of table.

Table 1 (Continued)
Comparison of Analytes Detected in Subsurface Soil Samples from Test Pits at Site 13 to Ecological Screening Criteria

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	13SS0201	13SS0302	13SS0503	13SS0503A Duplicate Sample	Invertebrate RTV[1]	Plant RTV[1]		Ecological Screening Value[2]
						Soil	Solution	
Laboratory Sample No:	22927002	22927003	22927005	22927006				
Collection Date:	06-OCT-92	06-OCT-92	06-OCT-92	06-OCT-92				
Sample Depth (ft bls):	5 to 6	8 to 10	8 to 9	8 to 9				
Inorganic Analytes (mg/kg)--continued								
Barium	7.5 J	6.3 J	7.1 J	7 J	NA	NA	NA	165
Calcium	130 J	151 J	192 J	194 J		NA	NA	NSC
Chromium	21	15.9	17.3	16.2	50	1	0.05	0.4
Cobalt	1.4 J	0.75 J	1.3 J	0.63 J	NA	NA	NA	20
Copper	5.8 J	3.9 J	5 J	5.3 J	NA	NA	NA	40
Iron	16,200	13,500	15,600	12,200	NA	NA	NA	200
Lead	6	5.8	4.7	5.5	NA	NA	NA	50
Magnesium	97.7 J	73.2 J	74.8 J	72.9 J	NA	NA	NA	NSC
Manganese	41.6	21.7	22.5	15.1	NA	NA	NA	100
Mercury	0.2 J	0.16 J	4.2	0.08 J	36	0.3	0.004	0.1
Nickel	2.1 J	--	--	--	NA	NA	NA	30
Potassium	--	--	180 J	--	NA	NA	NA	NSC
Silver	0.53 J	0.5 J	0.62 J	0.52 J	NA	NA	NA	2.0
Sodium	206 J	211 J	206 J	195 J	NA	NA	NA	NSC
Vanadium	44.6	38.2	40.1	34.9	NA	2	0.5	2.0
Zinc	10.2	6	7.3	6.8	NA	NA	NA	50
Cyanide	--	--	--	0.12 J	NA	NA	NA	0.9

See notes on following page.

Table 1 (Continued)
Comparison of Analytes Detected in Subsurface Soil Samples from Test Pits at Site 13 to Ecological Screening Criteria

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

[1] Plant and invertebrate RTVs are presented in Appendix G, Tables G-4 and G-5, respectively. Generally, the plant RTVs are the lowest observed effect concentration from among growth studies on plants in solid media. Invertebrate RTVs are the lowest concentration lethal to 50 percent of a test population (14-day soil test on *Eisenia foetida*) from among chemicals in the same chemical class (applies to organic compounds). A conservative factor of 0.2 was applied to invertebrate RTVs; the resultant value should be protective of 99.9 percent of the population from acute effects (Neuhauser et. al., 1986).
[2] The ecological screening values are the Region IV recommended ecological screening values (mg/kg) for soil. USEPA Region IV memorandum 4WD-OTS, December 22, 1998.

Notes: bls = below land surface.
µg/kg = micrograms per kilogram.
J = estimated value.
-- = concentration of analyte, if present, was less than detection limit.
PCB = polychlorinated biphenyl.
mg/kg = milligrams per kilogram.
RTV = reference toxicity value.
NSC = no screening concentration available.
NA = not available.

APPENDIX H

EVALUATION OF BACKGROUND ARSENIC CONCENTRATIONS FOR COVERED LANDFILL SITES

Appendix H

Evaluation of Background Arsenic Concentrations for Covered Landfill Sites Naval Air Station (NAS) Whiting Field, Milton, Florida

At Naval Air Station (NAS) Whiting Field, nine soil types, as identified by the U. S. Department of Agriculture, Soil Conservation Service (USSCS), are present. The Remedial Investigation (RI) sites at NAS Whiting Field are associated with seven of the nine soil types. The background surface soil data set for each RI site was initially determined to be composed of background surface soil samples from the same USSCS soil types as occur on the individual sites. However, available information and review of historical aerial photographs indicated that in the construction of landfills at the facility, a borrow pit was dug to an approximate depth of 10 to 15 feet below land surface and the excavated soil was piled to the side. Following landfill operations, the borrow materials, composed of undifferentiated surface and subsurface soils, were used for the landfill cover. Any additional soils required to complete the landfill cover are believed to have been obtained from other borrow pits located at the facility.

If a mix of surface and subsurface soils were used in the cover for landfills, it would be appropriate to use the combined data set of surface and subsurface soil samples as the background screening value. However, in order to be protective of human health and the environment, it is proposed that the background surface and subsurface data set be combined to a single value as be used as the "Industrial Use Soil Cleanup Goal". This modified "Industrial Use Soil Cleanup Goal" is specifically limited to the covered landfill sites including: Site 1, 2, 9, 10, 11, 13, 14, 15, and 16 and to the inorganic analyte arsenic.

Tables 3-8 through 3-18 in the General Information Report present the detected concentrations and summarize the analytical data for the individual background soil samples collected at NAS Whiting Field. A summary of the arsenic background data set and the modified "Industrial Use Soil Cleanup Goal" for arsenic is presented Table G-1. As indicated on the table the modified "Industrial Use Soil Cleanup Goal" for arsenic to be used at covered landfill sites is 4.62 milligrams per kilogram.

Table H-1
Summary of Arsenic Detected in Surface and Subsurface Background Soil Samples

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection Surface Soil Samples[1]	Mean of Detected Concentrations Surface Soil Samples[2]	Frequency of Detection Subsurface Soil Samples[1]	Mean of Detected Concentrations Subsurface Soil Samples[2]	Frequency of Detection Surface and Subsurface Soil Samples[1]	Mean of Detected Concentrations Surface and Subsurface Soil Samples[2]	Surface and Subsurface Soil Background Screening Concentration (modified Industrial Use Cleanup Goal)
Inorganic Analytes (mg/kg)							
Arsenic	15/15	1.54	14/14	3.14	29/29	2.31	4.62

[1] Frequency of detection is the number of samples in which the analyte was detected divided by the total number of samples analyzed.
[2] The mean of detected concentrations is the arithmetic mean of all samples in which the analyte was detected. It does not include those samples in which the analyte was not detected.

Note: mg/kg = milligrams per kilogram.

Table H-2
Comparison of Detected Arsenic Concentrations in Surface and Subsurface Soil Samples to Florida Soil Cleanup Target Levels

Remedial Investigation Report
For Surface and Subsurface Soil at
Site 13, Sanitary Landfill
Naval Air Station Whiting Field
Milton, Florida

Analyte	Minimum Detected Concentration	Maximum Detected Concentration	Mean of Detected Concentrations	Soil Cleanup Goals for Florida (Residential)[1]	Soil Cleanup Goals for Florida (Industrial)[1]	Modified Industrial Use Cleanup Goal[2]
Inorganic Analyte (mg/kg)						
Arsenic	0.52	6.3	2.31	0.8	3.7	4.62

[1] Source: Florida Department of Environmental Protection memorandum from John Ruddell, Director Division of Waste Management, to District Directors and Waste Program Administrators. Subject: Applicability of Soil Cleanup Target Levels for Florida, January 19, 1996.
[2] The modified Industrial Use Cleanup Goal for arsenic is twice the mean of detected concentrations in the surface and subsurface soil samples.

Notes: mg/kg = milligrams per kilogram.

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Building
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Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

April 27, 1998

Ms. Linda Martin
Department of the Navy, Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive, PO Box 190010
North Charleston, SC 29419-9010

file: arsenic1.doc

RE: Request for Site-Specific Arsenic Soil Cleanup Levels: Covered Landfill Sites, NAS Whiting Field

Dear Ms. Martin:

I have reviewed the request for approval of a site-specific Soil Cleanup Goal for arsenic at the "covered landfill sites" at NAS Whiting Field from Mr. Gerald Walker, ABB Environmental Services, dated April 22, 1998 (received April 22, 1998). Based on the prior presentation to Department Staff and the summary information furnished in the letter and the attached Appendix I, the request is granted to utilize a site-specific Soil Cleanup Goal for arsenic of 4.62 mg/kg at Sites 1, 2, 9, 10, 11, 12, 13, 14, 15 and 16., with the following conditions:

1. The sites may be utilized for activities that involve less than full-time contact with the site. This may include, but is not limited to, a.) parks b.) recreation areas that receive heavy use (such as soccer or baseball fields) or, c.) agricultural sites where farming practices result in moderate site contact (approximately 100 days/year, or less).

2. The Navy must assure adherence to the land use by incorporating the site and conditions in a legally binding Land Use Contol agreement.

3. The above Soil Cleanup Goal shall not be utilized at any other site without specific Department approval.

If you have questions or require further clarification, please contact me at (904) 921-4230.

Sincerely,

James H. Cason, P.G.
Remedial Project Manager

APPENDIX I

RESPONSES TO REGULATORY COMMENTS

Final Response to Review Comments
Remedial Investigation Report
Site 13, Sanitary Landfill
NAS Whiting Field, Milton, Florida

Florida Department of Environmental Protection

1. The title of the report should be "The Remedial Investigation Report for Surface and Subsurface Soil at Site 13, Sanitary Landfill."

   Response: The report title will be revised as recommended.

2. Table 5-7, 5-11 and all others: the soil and ground water contaminant levels should be compared to the TCLs for each of respective media in Chapter 62-785, F.A.C, including the leaching values for all contaminants. In cases where the leaching values are exceeded, what does the Navy intend to do?

   Response: Soil and groundwater detections will be compared to 62-785 cleanup target levels, including leaching values. If leaching values are exceeded, SPLP sampling may be necessary to determine if remedial action is warranted.

3. The State of Florida has granted a site-specific industrial values for the covered landfill sites (including Site 13) at NASWF. This value and the conditions attached to it (land use restrictions) should be discussed and cited in the text and appropriate tables (such as Table 5-9); the letter should also be included in the Appendix.

   Response: The site-specific industrial value will be included in the text and tables for the Site 13 RI. The letter referencing the site-specific industrial value will be included in the appendix.

4. The site-specific value that was previously discussed for arsenic is exceeded according to Table 5-9, but I cannot tell how many times and where those values occurred areally. Please prepare a figure which depicts the locations where residential/industrial values of contaminants in surface soils are exceeded so that decisions may be made regarding adequacy of contaminant delineation. Please prepare a similar figure (or modify an existing figure) for groundwater contaminants.

   Response: Figures will be prepared showing the distribution of arsenic in surface soil and the distribution of contaminants exceeding GCTLs.

5. Section 6.0, Human Health Risk Assessment: please utilize the TCLs in Chapter 62-785, F.A.C., for the assessment and in the various tables, as previously noted in comment 2.

Response: TCLs from Chapter 62-785 will be incorporated into the Human Health Risk Assessment.

6. Table 6-7: the exposure point concentration should be 7, not 5.3, since only one sample was detected as having contamination and using on-half only serves to dilute the single positive sample.

   Response: The EPC for TCE will revised as suggested by the reviewer.

7. Table 6-8: The correct ELCR for Site Maintenance Worker should be 9x10-7.

   Response: Text will be revised as recommended.

8. Table 6-10 and 6-11: The table should utilize the values from Chapter 62-785, F.A.C., including the leaching value for arsenic. In Table 6-10, reference is given to site-specific goals in appendix G. The discussion is in appendix H and the background screening concentration is not discussed at that point. Where does the "3" come from? In Table 6-11, where does the value 6.2 for the background screening concentration come from ?

   Response: The tables will be revised to include the leaching value for arsenic. The reference to site-specific goals will be changed to Appendix H. The background screening concentration will be discussed in Appendix H and the "3" will be changed to a value of 4.62. The value of 6.2 will be changed to the correct value of 4.62.

9. Table 6-12: the EPC for trichloroethene is incorrect.

   Response: The correct EPC for trichloroethene is 7. Table 6-12 will be revised.

10. Please prepare a summary table of background values for soil and groundwater, including references pertaining to their origin.

    Response: Tables 5-7, 5-11, and 5-14 include background values for soil and groundwater. References will be revised to identify their appropriate origin.

11. Please carefully consider the possibility at the sites in this document where concrete, either from floors or runway/taxiways may be serving to apparently prevent a complete soil exposure pathway at certain sites. It is important that the Navy address this concern, as it is directly related to the problem of not only future exposure risks, but also in the future when concrete may be removed or repaired, at which time it may complete the exposure pathway

or may contaminate surface/subsurface soil and ground water by virtue of leaching from soil that was formerly covered by concrete. Has the Navy adequately addressed both the risk and the leaching scenario for any or all of the sites that are covered in the RI? If not, we need to discuss this and assure that it has been addressed properly.

Response: This comment does not apply to Site 13.

12. Section 9.0, Conclusions: the ground water gradient is southeast; using the figure requested in comment 3, confirm or justify that contaminants are not migrating off the site.

    Response: Contaminant migration at Site 13 will be addressed in the Site 40 basewide groundwater investigation.

13. Section 9.0, Conclusions: considering that surface soil and ground water analyses yielded significant risks for future residents, please justify the statement on page 9-2 that says "The contaminant of concern with respect to human health detected in surface soil, subsurface soil, and ground water do not pose unacceptable carcinogenic risk to any receptors evaluated." Am I missing something?

    Response: The above referenced conclusion is incorrect and will be deleted from Section 9.0.

Final Response to Review Comments
Remedial Investigation Report
Site 13, Sanitary Landfill
NAS Whiting Field, Milton, Florida

U.S. Environmental Protection Agency

General Comments

1. In Section 5, tables were used to summarize surface and subsurface soil data for Site 13 and to compare maximum detected concentrations to federal and state screening criteria. The screening criteria utilized were EPA Region III Risk-Based Concentrations (RBCs), adjusted to a Hazard Quotient = 0.1, and Florida Department of Environmental Protection residential and industrial soil cleanup goals. It appears that many of the values utilized as screening criteria were rounded. In most instances the rounding would not likely have a significant effect on the evaluation of the data. However, in some instances where the screening criteria value is relatively high, as in the case for aluminum, the rounding is significant. For example, the EPA Region III RBC for aluminum based on an industrial setting is 78,000 milligrams per kilogram (mg/kg). In the tables presented in Section 5, the screening criteria was rounded to 100,000 mg/kg. It is not clear why rounding was utilized. The actual screening values should be used.

   Response: As recommended by the reviewer, actual screening values will be used in the Section 5 tables.

2. Surface and subsurface soil data were evaluated for purposes of assessing impacts to human health and ecological receptors through direct contact, ingestion, inhalation, etc. Surface and subsurface soil human health risks were evaluated by comparing maximum concentrations to federal and state soil screening levels for residential and industrial scenarios. In addition, human health and ecological risk assessments were performed. However, no evaluation of the soil data was performed with respect to evaluating the potential for soil contamination to contribute to groundwater contamination. It is recommended that soil screening levels be developed to qualitatively assess the potential for soil contamination to impact groundwater. Screening level development is outlined in the EPA guidance document *Soil Screening Guidance: Users Guide, April 1996, Publication 9355.4-23*. Once screening criteria are developed, a comparison to levels of contamination found at the site should be performed to assess/evaluate the potential for soil contamination to impact groundwater.

   Response: Effects of soil contamination on groundwater will be included as a comparison of contaminant levels to leachability cleanup target levels.

Final Response to Review Comments
Remedial Investigation Report
Site 13, Sanitary Landfill
NAS Whiting Field, Milton, Florida

Specific Comments

1. **Figure 3-2**. This figure depicts two "WHF-13-CPT-2" locations and no "WHF-13-CPT-1" location. This discrepancy should be corrected.

   Response: The correct PCPT designations will be added to Figure 3-2.

2. **Page 3-5, Section 3.3, First Paragraph**. This section discusses the locations of and rationale for Phase IIA and IIB surface soil samples. This section states that Phase IIA soil samples were collected at biased sample locations within the landfill itself (at test pit locations). It is stated that because these samples were biased samples based on surface conditions or geophysical anomalies, Phase IIB samples were proposed for collection from random sampling locations along the perimeter of the landfill to confirm the presence or absence of chemicals previously detected in Phase IIA. Given this rationale for the Phase IIB samples, it seems appropriate that the Phase IIB samples would be located at random unbiased locations within the landfill perimeter where contamination would be expected to be the highest. The Phase IIB samples were not collected from the surface of the landfill (i.e. within landfill perimeter as determined by geophysical methods) as were the Phase IIA samples. The exact purpose of these samples is unclear. Clarification should be provided to explain the intended use of these samples.

   Additionally, this section states that the locations were selected using the systematic sampling method. Sample locations were reportedly selected by randomly identifying a sample location on a transect and collecting additional samples at equidistant intervals along this transect. However, according to Figure 3-2, the Phase II B soil samples (13S001 through S005) do not appear to be equidistant from each other.

   Response: The phase IIA soil samples designated 13-SL-01 through 13-SL-05 were collected from the interval between land surface to a depth of twelve inches bls at locations adjacent to the five test pits. The Phase IIA surface soil sample locations were based on observed surface conditions and co-located with geophysical survey anomalies. The Phase IIB samples (13S00101 through 13S00501) were collected to confirm the presence or absence of chemicals previously detected, to provide full coverage of the site, and to characterize the nature and extent of contamination. The Phase IIB samples were collected in December 1995 and are shown on Figure 3-2.

The ten surface soil samples collected during Phase IIA and Phase IIB field program provide analytical results to characterize all areas of Site 13.

3. **Page 4-2, Section 4.2.1, First Paragraph**. This paragraph discusses how precision of analytical data is determined and evaluated. The paragraph states that laboratory duplicates, field duplicates, matrix spike/matrix spike duplicates (MS/MSD) and/or consecutive laboratory control samples are used to evaluate precision. However, this section only discusses results of field duplicate analyses (Table 4-1). A discussion should be provided concerning laboratory duplicates, MS/MSD and/or laboratory control samples as it applies to precision evaluation.

   Response: Text will be revised to state only field duplicates were used to evaluate precision. References to MS/MSD and/or lab control samples will be deleted.

4. **Page 4-2, Section 4.2.1, Fifth Paragraph**. This paragraph indicates that the relative percent difference (RPD) for three volatile organic compounds (VOCs) were not met for sample 35G00101. However, according to Table 4-1 (page 4-6) only 1 VOC (xylene) and two inorganics (thallium and zinc) were not in acceptable ranges. This discrepancy should be addressed.

   Response: The text will be revised to indicate that one VOC and two inorganics were not in acceptable ranges.

5. **Figure 5-2**. This figure depicts groundwater potentiometric contours at Site 13. Well WHF-13-45 should be changed to WHF-13-4S.

   Response: The well number will be revised as recommended.

6. **Page 5-25, Section 5.4, Second Paragraph**. This section describes results of soil gas analyses. This paragraph states that the maximum detection limit for the flame ionization detector was 5,000 parts per million (ppm) and 1,000 ppm for the Organic Vapor Analyzer (OVA). However, an OVA is a flame ionization detector. This discrepancy should be clarified.

   Response: The text will be revised to indicate the maximum detection limit for the Portafid II was 5,000 ppm.

7. **Page 5-25, Section 5.4, Fourth Paragraph**. This paragraph states that "current conditions" do not require remedial actions for methane gas generation with respect to

Florida Statute 62-701. As noted in Table 5-6, many soil gas sample locations had relatively high detections, with methane concentrations unquantifiable because methane concentrations were above the maximum detection limits of the instruments. In light of these readings, the basis for the conclusion that current conditions do not warrant action should be provided. **[If under FL statute the methane does not have to be addressed, then no action is warranted. However, the statute limitations should be examined with respect to actual site concentrations and appropriate actions under the statute should be considered. Any actions necessary to address methane would have to be evaluated in the FS for the site.]**

Response: If a landfill was closed prior to 1985, Florida Statute 62-701 does not apply to the site. Site 13, Sanitary Landfill was closed in 1984. Therefore the statement, *current conditions do not require remedial actions,* is accurate.

8. **Page 5-40, Section 5.5, Fifth Paragraph**. This paragraph discusses results of inorganic analyses in surface soil samples. The paragraph indicates that aluminum, arsenic, iron, and vanadium exceeded EPA Region III RBCs for residential screening values. However, according to Table 5-9, manganese should also be included. This discrepancy should be addressed.

   Response: The text will be revised to include manganese as an analyte exceeding EPA Region III RBCs.

9. **Page 8-6, Section 8.2.2, Sixth Paragraph**. This paragraph discusses fate and persistence characteristics of inorganic contaminants at the site. The report states that elevated concentrations of aluminum and iron in groundwater and soils have been observed at other sites at Whiting Field. Therefore the report concludes that aluminum and arsenic at Site 13 "are" attributable to natural occurrence in the environment rather than waste disposal. As seen in Section 5, Table 5-9, Table 5-11, and Table 5-14, aluminum and iron data were compared to background data for the site. Maximum detected concentrations were found to be above the established background concentrations for these contaminants. Therefore, the conclusion that aluminum and iron are attributable to natural occurrence is not supported by the data. This discrepancy should be clarified.

   Response: The text will be revised to indicate that aluminum and iron may be attributable to natural occurrences in the environment or may be site related.

9a. The text should state that Al and Fe may be attributable to natural occurrences; however, because maximum detected concentrations were found to be above the established

background concentrations, the presence of these two inorganic contaminants may be site related.

Response: The text will be revised to indicate that "aluminum and iron may be attributable to natural occurrences; however, because maximum detected concentrations were found to be above the established background concentrations, the presence of these two inorganic contaminants may be site related".

Final Response to Review Comments
Remedial Investigation Report
Site 13, Sanitary Landfill
NAS Whiting Field, Milton, Florida

Review Comments for the Human Health & Ecological Risk Assessment

GENERAL COMMENTS

1. Region IV has determined that ecological risk assessments (ERAs) that have not been finalized must reflect the ecological risk assessment process outlined in the *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (hereafter referred to as the *Process Document*), which was issued by the Agency in June 1997. Information presented in the *Process Document* supersedes all prior guidance. The ERA for Site 13 does not follow the procedures outlined in the *Process Document* and therefore must be reorganized and revised. The ERA should begin with a site description and identification of complete exposure pathways. The sampling data should then be screening against ecological screening levels only. Those compounds that are present at concentrations greater than ecological screening levels are then addressed in the problem formulation step. It is not until the problem formulation step that compounds are compared to background levels or identified as essential nutrients. Also, receptors should not be identified until after the ecological screening, since receptors should be selected in part on the basis of the screening results. Refer to the *Process Document* for additional guidance on revising the ERA.

   Response: The ecological risk assessment for Site 13 is a combination of a screening-level and baseline risk assessment because the remedial investigation process for this site was initiated several years ago (prior to the integration of the "Process Document" as the preferred USEPA Region IV ecological risk guidance document into the remedial investigative process at Whiting field). In order to maintain consistency with the risk assessments that have been completed at NAS Whiting Field, this ERA will not be revised.

1a: It does not matter that previous ERAs were completed using the older guidance documents. If guidance changes prior to the finalization of the RI, the new guidance must be considered. An analysis should be conducted to determine whether following the newer process document will have any effect on the outcome of the ERA. This analysis should be completed prior to making widespread changes to the ERA.

   Response: The Navy will review data collected for the RI and determine if information outlined in the *Process Document* will effect the conclusions presented in the report. IF necessary, information pertaining to this evaluation will be included in the RI report.

2. The soil screening levels [Beyer, W.N. 1990. Evaluating soil contamination. US. Fish. Wildl. Serv., Biol. Rep. 90(2)] that are used as ecological screening values for Site 13 may not be sufficiently protective of ecological receptors. Region IV is in the process of issuing ecological soil screening levels. The Region IV screening levels were obtained from several sources, including the new levels from the Netherlands, and levels from the Canadian Council of Ministers of the Environment and Oak Ridge National Laboratory. As per Region IV guidance, screening levels used in ERAs that have not been finalized must be comparable to the values that are being adopted. The screening values for three inorganic analytes that are used in the ERA for Site 13 are sufficiently different from those being adopted to request changes in the ERA. The recommended screening value for chromium is 0.4 mg/kg rather than the 100 mg/kg that was used in the ERA, and screening values of 200 mg/kg for iron and 2.0 mg/kg for silver are being adopted. Risks from chromium need to be quantified and a Hazard Quotient (HQ) calculated for all receptors. Iron is present at concentrations greater than the ecological screening level, and iron toxicity should be discussed at greater length. Silver is present at below screening levels and need not be included in the quantitative assessment of risk.

   Response: The new Region IV ecological screening values will incorporated into the Site 13 ERA and the results will be revised accordingly.

3. An assessment of risks from subsurface soil to ecological receptors is not included in the ERA. Although it is unlikely that birds and mammals will have consequential contact with subsurface soil, it is probable that the root zone of deep-rooted plants such as trees will include subsurface soil. Also, soil invertebrates such as earthworms and ants can be expected to burrow into the subsurface soil. An assessment of risks from contaminants in subsurface soil to these receptor groups should be included in the ERA.

   Response: The Navy agrees that deep rooted plants could be exposed to subsurface soil. However, as indicated in the site characterization there were a number of herbaceous, scrub/shrubs, and tree species identified at Site 13, none of which showed signs of stress. There was one area identified as being sparsely vegetated at the site, however, the lack of vegetation is likely due to the presence of a dense red clay layer in this area. In addition, the organic and inorganic analytes that were detected in subsurface soil samples were at relatively low concentrations and low frequency and no pesticides or PCBs were detected in subsurface soil samples. Therefore, it is unlikely that the evaluation of subsurface soils would alter the results of this ERA.

3a: The EPA's comment stands and as such the assessment requested in the Agency's comment should be conducted and included in the ERA.

Response: The Navy will complete an assessment and pertinent information will be included in the RI report.

4. The risks to herbivorous birds are not addressed in the ERA. A representative herbivorous bird species should be included as a receptor in the ERA.

Response: The available bioaccumulation data suggest that risks predicted for a graminivorous bird species would not exceed those of omnivorous birds (i.e., meadowlark). Therefore, an herbivorous bird will be not be included as a receptor in the ERA.

4a. This response is not consistent with the responses to similar comments from previous remedial investigations in which it was indicated that a herbivorous bird species would be included in the ERA.

Response: Risks to herbivorous birds will be evaluated separately. Information pertaining to this evaluation will be presented in the RI report in a separate section. The tables presented in the draft RI will not be revised, however new tables will be developed to present any additional information.

5. HQs for contaminants at Site 13 are calculated using the 95% Upper Confidence Limit (UCL) rather than the maximum site concentration. Region IV has determined that 95% UCLs should not be used in ERA. Rather, to show the potential risk at the site, Hazard Quotients (HQs) should be determined using the following combinations: maximum site concentration/NOAEL, average site concentration/NOAEL, maximum site concentration/LOAEL, and average site concentration/LOAEL. For Site 13, the perceived maximum risks are increased less than two-fold if the maximum concentration is used rather than the 95% UCL, and the resulting maximum HQ is less than 3. No changes are requested in the Site 13 ERA regarding to the use of the 95% UCL, but future submittals for other Sites should not use the 95% UCL to calculate risk.

Response: Future ERAs will be conducted using the maximum and average concentrations

Final Response to Review Comments
Remedial Investigation Report
Site 13, Sanitary Landfill
NAS Whiting Field, Milton, Florida

SPECIFIC COMMENTS

1. **Section 7.1, Page 7-2, Line 26**. The text states that water in the "Y" ditch is intermittent and does not provide adequate aquatic habitat to support aquatic receptors. The text does not state whether the water in the "Y" ditch is used by terrestrial receptors at Site 13 for drinking and bathing. The text must provide additional discussion about the water in the "Y" ditch, including some justification for not including this intermittent surface water as a complete potential exposure route.

   Response: The "Y" ditch is a conduit for surface water runoff and is only flooded during and immediately after storm events. Water is not present in the ditch for long enough periods to support aquatic receptors. There is a potential for terrestrial receptors to use the flooded ditch, however the significance of this exposure pathway is negligible, based on the temporary nature of the exposure. In addition, it is likely that this ditch would not be considered by an ecological receptor as a dependable source of water due to the incidental and sporadic nature of this ditch.

1a. The text of this response should be included in the body of the report to provide additional clarification.

   Response: As recommended, this information will be included in the RI report.

2. **Section 7.2.2, Page 7-5 and Figure 7-2, Page 7-6**. The Conceptual Site Model (CSM) presented in the ERA is too general. Only three groups of ecological receptors are identified–wildlife, terrestrial plants, and terrestrial invertebrates. As per guidance in the *Process Document*, the CSM should distinguish between exposure routes for different groups of receptors such as herbivorous birds and mammals, primary carnivores/omnivores, and secondary carnivores, and should illustrate the food web that is being modeled. The CSM should be revised.

   Response: As identified by the reviewer, the CSM is general and does not provide the detail outlined in the *Process Document*. However, the general approach used in this ecological risk assessment concluded there would be no adverse affects to ecological receptors. The selected ECPCs are not present at concentrations much elevated above background and bioaccumulating compounds are not present at the site. Therefore, it is unlikely that incorporating more detailed exposure pathways would change the outcome of the risk assessment. In addition, refer to response to general comment #1 and general comment #4 regarding the *Process Document*.

2a. As stated previously, the newer process document guidance should be considered so it can be stated with increased certainty that the outcome would not change.

Response: Based on Navy's evaluation per guidance in the *process document*, it is unlikely that incorporating more detailed exposure pathways would change the outcome of the risk assessment. All future documents will develop CSMs that are more site-specific.

3. **Section 7.2.2, Page 7-7, Paragraphs 1 and 2**. The text states that dermal adsorption and inhalation are considered negligible exposure pathways. This is true only in comparison with the ingestion exposure pathway. The text should be modified to qualify the statement. Also, the exclusion of the dermal adsorption and inhalation pathways from the ERA should be discussed as a source of uncertainty in the Uncertainty Analysis (Section 7.7).

Response: Dermal absorption and inhalation pathways are negligible based on the type and magnitude of ECPCs at the Site. However, an uncertainty regarding dermal absorption and inhalation will be added to Section 7.7.

4. **Section 7.2.2, Page 7.7, Line 12**. The text states that no burrowing animals were observed as Site 13 during characterization. This does not mean that burrowing animals will not inhabit Site 13 in the future, since the area appears to be desirable to ecological receptors. The text should be modified to state that although no burrowing animals were seen at Site 13, the Site does provide acceptable habitat for burrowing animals.

Response: The last sentence of the fifth paragraph in Section 7.2.2 will be modified to include a statement regarding the suitability of the site for burrowing animals. "....although this habitat may be suitable to these species."

5. **Section 7.2.3, Page 7-7 through 7-9, and Table 7-1, Page 7-8**. The assessment endpoints are not appropriate. The concern regarding plants and soil invertebrates is limited to a reduction in total biomass sufficient to affect wildlife populations. The concerns for small mammals and birds are adverse effects due to the consumption of contaminated food, although the consumption of contaminated soil may prove a greater exposure risk than prey items. The concern for secondary predators is whether bioaccumulating chemicals are present in prey items at sufficient concentrations to cause risk. These endpoints are too general and do not appear to be sufficiently protective of the ecosystem. Assessment endpoints should be specific to the contaminants and receptor groups. It should be possible to draw a conclusion as to whether the endpoint is met (for

example, there is no way to assess if the plant and soil invertebrate population has been reduced to a level that affects other organisms). Also, the stated measurement endpoints do not relate to these assessment endpoints. The measurement endpoints are Toxicity Reference Values (TRVs), the concentration of a compound that causes a toxic response in an individual organism. There is no research relating TRVs to the health of a population. The assessment endpoints should be revised and related to the measurement endpoints. Refer to Section 3.5 of the *Process Document* for guidance.

Response: The Navy acknowledges that the assessment endpoints are general, however it is unlikely that incorporating more detailed assessment endpoints would affect the outcome of the risk assessment. Refer to response to general comment #1 and comment #2.

5a. Refer to previous responses to the Navy's response to comments regarding this issue.

Response: The Navy will review data collected for the RI and determine if this evaluation will effect the conclusions presented in the report. IF necessary, the text will be revised to include the evaluation results.

6. **Section 7.3, Page 7-9, Paragraph 7, and Table 7-2**. The soil screening values [Beyer, W.N. 1990. Evaluating soil contamination. US. Fish. Wildl. Serv., Biol. Rep. 90(2)] that were used as ecological screening values for Site 13 may not be sufficiently protective of ecological receptors. New soil screening guidance, based on new values from the Netherlands, the Canadian Council of Ministers of the Environment, and from Oak Ridge National Laboratory, can be obtained from Region IV.

Response: Table 7-2 will be updated and the potential for risk will be reevaluated. Also, please refer to response to general comment #2.

7. **Figure 7-3 and Table 7-2, Pages 7-10 through 7-13**. The selection process for ecological chemicals of concern has been changed in the *Process Document*. The selection process in this ERA for Site 13 should be revised to be in agreement with the new guidance.

Response: Please refer to response to general comment #1.

7a. The guidance should be considered to determine if any change in the overall outcome of the ERA would occur. See the previous responses to the Navy's response to comments regarding this issue.

Response: The Navy will review the selection process and determine if it will effect the conclusions presented in the report. If required, information pertaining to this evaluation will be included in the RI report.

8. **Section 7.4.2, Pages 7-14 through 7-17**. No herbivorous bird species was included as a receptor in the Site 13 model. Herbivorous avian species are found at Site 13 and it is likely that the calculated risks to these species are different than those to the Eastern Meadowlark, which consumes approximately 20% of its diet as plant materials. An herbivorous bird species should be included as a receptor in the ERA.

Response: Please refer to response to general comment #4.

8a. Refer to the previous response to the Navy's response to comments regarding this issue. The herbivorous bird species has been added to the ERAs in other RI Reports as a result of comments received and should be done here as well.

Response: Please response to general comment #4a.

9. **Table 7-6, Page 7-20**. Footnote 1 states that the bioaccumulation factors (BAFs) for plant material are based on the assumption that plants are 80% water. This assumption applies to berries and leafy vegetables, but does not apply to grains, which have a moisture content of only 10%. Since the diet of the cotton mouse may consist primarily of grains, the risks to the cotton mouse may be underestimated. This source of uncertainty should be discussed in the Uncertainty Analysis (Section 7.7).

Response: As recommended, an uncertainty will be added to the ERA to address this issue.

10. **Section 7.6.1, Page 7-23, Paragraph 4; Section 7.8, Page 7-26, Paragraph 4; Section 9.1, Page 9-2, Paragraph 11**. The text states that because the Hazard Indices for the short-tailed shrew only slightly exceed 1, population-level sublethal impacts are unlikely. The toxicity data used in this ERA were based on effects on individual organisms. No research is available correlating effects on individuals with impacts on populations. Therefore, no statement correlating individual and population impacts should be made. The text should be revised, and additional discussion of the significance of Hazard Indices greater than 1 should be presented.

Response: The HI concept does not function as a threshold of effects, but as a continuum where realization of the assessment endpoints becomes more plausible along this continuum as the extent of contaminant related mortality relative to natural mortality becomes more significant. As the HI increases the likelihood of population level effects also increases (i.e., the likelihood that more individuals in a population would have adverse effects). Therefore, reasonable inferences regarding the potential for population level impacts can be made.

10a. This response is contradictory. The response states that population effects are more plausibly presented; however, the response also states that "individuals" in a population are likely to show adverse effects. That being the case, the text should be revised as suggested in the comment.

Revised Response: The HI concept does not function as a threshold of effects, but as a continuum where realization of the assessment endpoints becomes more plausible along this continuum as the extent of contaminant related mortality relative to natural mortality becomes more significant. As the HI increases the likelihood of population level effects also increases. Therefore, reasonable inferences regarding the potential for population level impacts can be made.

11. **Section 7.7, Page 7-24, Paragraph 7**. The text states that risks to amphibians and reptiles species were not estimated because bioaccumulation and toxicity data are lacking. Since quantitative exposure data are not available, a brief qualitative discussion of the anticipated risks to these groups should be included in the Uncertainty Analysis in addition to the current statement that quantitative risks were not estimated.

Response: As recommended by the reviewer, an uncertainty will be added to the ERA to address this issue.

12. **Section 9.1, Page 9-2, Paragraph 8**. The text states that surface soil was the only medium of concern in which contaminants of potential concern to ecological receptors were detected. Surface soil was the only medium that was evaluated in the ERA; no discussion of contaminants in other media was presented. The text should be revised.

Response: The text will be revised as recommended.

13. **Appendix D, Groundwater Methodology.** Appendix D presents the groundwater analytical data acquired during the Phase IIB study. By reviewing the reporting limits, it appears that a routine TCL VOC was performed rather than a low level TCL VOC

analysis. A low level analysis would be useful for comparison of groundwater data to drinking water standards. Since the Sampling and Analysis Plan for this project was not reviewed, it cannot be determined whether low level VOC analysis was required for the groundwater samples at Site 13.

Response: Groundwater is being addressed under the Site 40, Basewide Investigation. The work plan for the Site 40 investigation will identify appropriate analytical methods for attaining lower detection limits.

14. **Table F-9, Page F-15**. The table is titled, "Dermal Dose-Response Data for Noncarcinogenic Effects." However, it appears that the table contains the dose-response data for the inhalation pathway. The table title should be corrected accordingly.

    Response: The Table F-9 titled will be revised as recommended by the reviewer.

15. **Table F-9, Page F-15**. The table does not include an inhalation RfD for aluminum. However, there is an EPA/NCEA provisional value for aluminum that is available. The provisional inhalation RfD value for aluminum should be included in the table.

    Response: The EPA/NCEA provisional value for aluminum will be included in Table F-9.

SPECIFIC COMMENTS REQUIRING ONLY ACTION TO CORRECT THE DOCUMENT

1. **Page 4-2, 1st full paragraph.** The third sentence states that "The Site 31 Phase IIB soil and groundwater analytical data were validated...". This should be corrected to read "Site 13", not "Site 31".

   Response: Text will be revised as recommended.

2. **Section 7.1, Page 7-4, Line 34**. The text states that Coldwater Creek is located approximately 3,000 feet southeast of Site 13. Coldwater Creek could not be located on any of the maps included in this *Remedial Investigation Report*. It is assumed that Coldwater Creek and Big Coldwater Creek are different water bodies. Coldwater Creek should be included and identified on the Site maps in Section 1.

   Response: The RI report will be revised as recommended.

3. **Table 7-2, Pages 7-11 through 7-13.** The header "Ecological Screening Value" is marked with a superscript "6". The correct footnote reference is "5". The Table should be corrected.

   Response: The table will be revised as recommended.

4. **Figure 7-2, Page 7-6**. The bullets that appear in various receptor/exposure route boxes are not defined in either the Figure or the text. A definition should be added to the Figure.

   Response: The figure will be revised as recommended.